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CA FINAL – New Syllabus
STRATEGIC COST MANAGEMENT
AND PERFORMANCE EVALUATION
VOLUME – II (Version 4)

(Notes for Private Circulation only)

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Note : You can download the latest exam papers and solutions, latest changes etc. from our website www.carakeshagrwal.in from a tab 'Student Corner'.

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Coverage of Syllabus in Version 4

S.N.	Particulars
1.	Entire ICAI Module up to November, 2020 edition
2.	Revisionary Test Papers (RTPs) up to May, 2021
3.	Mock Test Papers (MTPs) up to October, 2020
4.	Past Exam Papers up to January, 2021 exam
5.	Additional Questions uploaded on website up to June, 2021
6.	Additional Case Studies uploaded on website up to June, 2021
7.	Additional Case Scenario uploaded on website up to June, 2021
8.	Old Syllabus CA Final Costing Module - Relevant & selected questions only
9.	Old Syllabus CA Final QT Module - Relevant & selected questions only
10.	Old Syllabus CA Final AMA PM - Relevant & selected questions only
11.	Case Study Digest of ICAI - Issued in February, 2021

Important Note :

Constant change is a way of life today. In spite of covering the above portion in this version, there is always a possibility that, by the time you appear for your exams; some more exams might have taken place in between, some changes may be proposed by ICAI and so on ...

To keep yourself updated with these changes and updates, I have made a practice to keep on uploading soft copy of Amendment Batch Notes, once in a year. It will be available to you for downloading, free of cost on our website : www.CaRakeshAgrawal.in

You may visit '**Student Corner**' section on our website for such changes and free downloads. The answers to subject related common query are also available there. Some tips for how to study, important topics, how to prepare time table, how to deal with theory, how to prepare for case study etc. are also available on our website, at the same place.

Objective :

My objective is that, you should not only clear your exam in the first attempt but you should also make use of this knowledge in your professional career to the extent possible. Getting CA degree is important, but gaining knowledge is also equally important.

With Best Wishes !

8

PERFORMANCE MEASUREMENT AND EVALUATION

Responsibility Accounting (RA)

Responsibility accounting is the collection, summarization, and reporting of financial information where individual manager is held accountable for certain costs, revenue, or assets of the firm. The information is about the decision centers throughout the organization. It can also be called profitability accounting or activity accounting.

Responsibility accounting is apt where top management has delegated authority to make decisions. The idea behind responsibility accounting is that each manager's performance should be judged by how well he or she manages those items under his or her control.

Types of Responsibility Centres :

Generally an organisation classifies its various departments or divisions into the following 4 categories for the purpose of performance evaluation.

1. Cost Centre
2. Revenue Centre
3. Profit Centre
4. Investment Centre

1. Cost Centre

Cost or Expense Centres are responsibility centres where the manager of such a centre or division is responsible for the costs associated with that centre and hence the main focus is cost minimisation.

2. Revenue Centre

Revenue Centres are responsibility centres where the manager is totally concerned with raising revenue with no responsibility for costs. The key measures used in appraising performance would be monitoring sales variances from budget.

3. Profit Centre

Profit Centres are responsibility centres where the manager of such a centre or division has responsibility for both revenue as well as costs incurred in his division. Thus, performance is measured in terms of the difference between the revenues and costs that relate to a profit centre.

4. Investment Centre

Investment Centres are responsibility centres where the manager has responsibility for not just the revenues and costs relating to the centre, but also the assets that generate these costs and revenues and the investment decisions relating to disposal and acquisition of assets.

Organisational Structure :

Organisational structure outlines the roles of individuals in the organisation and decide the way in which authority and responsibility is allocated among them and how they are coordinating with each other to attain organisational goals.

Performance measurement is directly linked to the organisational structure of a business. A distinction can be made between the following **four** categories of organisational structure for performance appraisal :

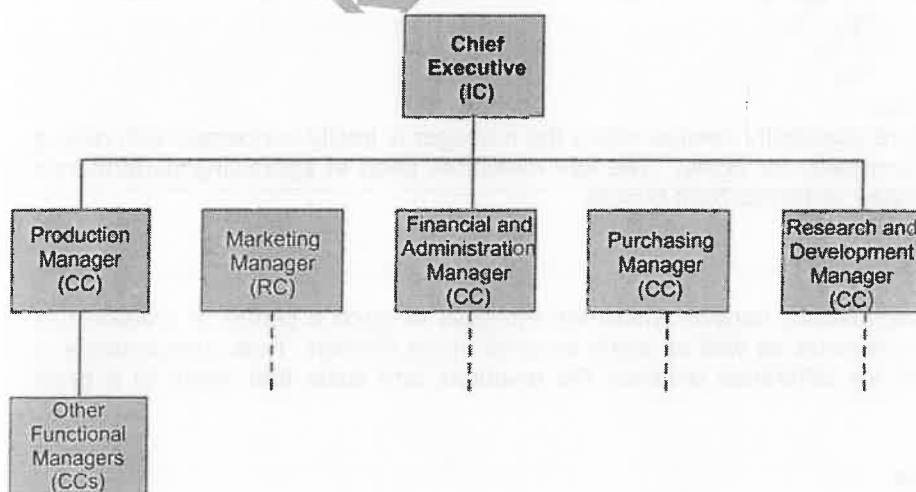
- Entrepreneurial organisation structure
- Functional organisation structure
- Divisional organisation structure
- Matrix organisation structure

Entrepreneurial Organisational Structure

Since the entrepreneur (owner) is often expected to have specialized knowledge of product (be it good or service), hence in an entrepreneurial structure; the management & control revolves around such owner only. In absence of professional management, such an entrepreneur owner act in a dual capacity; both as owner and manager. This structure prevails in service entities or in the businesses which are in their early days. In India, we observe it mostly in case of Sole Proprietorship business, Partnership business and Private Limited companies.

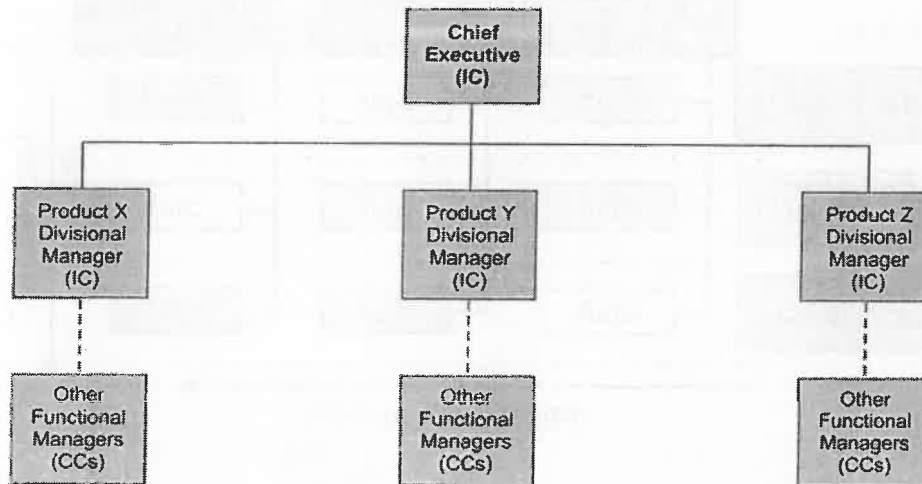
Functional Organizational Structure

A functional organizational structure is formed when a business departmentalizes, according to the basic business functions such as production, sales, purchases, marketing and finance etc. Small and medium-sized businesses frequently implement this organizational structure, which often includes a production and operations department, a finance department, and a marketing department. In a functional organizational structure, pricing decision, product mix decision and output decisions will be made by central management. Consequently, the functional managers in a centralized organization will have far less independence than divisional managers.



Divisional Organizational Structure

An organization with a divisional organization structure has various divisions operating autonomously as business under a broad corporate framework according to geographical areas, markets, or products and services. These are often called as Strategic Business Units (SBU's).



Note : In the above flowchart, IC stands for Investment Centre, CC stands for Cost Centre, RC stands for Revenue Centre.

Generally, this type of organizational structure leads to a decentralization of the decision-making process. Using this structure, division heads are free to set selling prices, choose which market to sell in, make product mix and output decisions, and select suppliers.

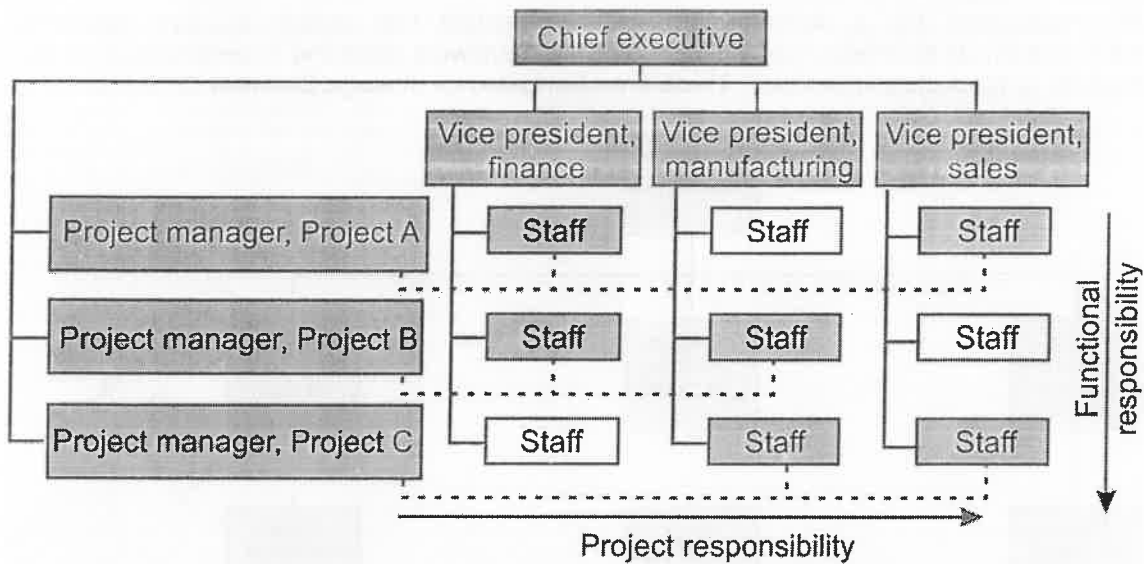
The formation of separate divisions may lead to the delegation of authority. For example, in some organizations a divisional manager may, in addition to having authority to make decisions on sources of supply and choice of markets, also have responsibility for making capital investment decisions. Performance measurement systems depend on the degree of decentralization involved. In general, more the authority – more is the responsibility. Both of them go hand in hand. Examples - ITC, RIL, Tata Sons etc.

Matrix Organizational Structure

In a matrix structure, cross-functional teams are formed to reap the benefits of decentralisation, speedy decisions and early resolution of prospective disputes or issues, because representatives of different functions are part of team. Cross-functional team contain staff from different functions and who are responsible to achieve a specific target in a united way.

Please refer the organisational structure diagram given below -

The shaded staff in the diagram is required to report twice, once to their functional leader and another to project manager. Conflict of interest is expected, but availability of cross-functional skills is a key advantage.



Performance Management System

Performance management shall be considered as an essential aspect of management accounting. Performance management may be seen as four-stage solution to take any organisation towards sustainability. These four stages are :

- Firstly determine the organisational structure and also ensure that the structure must be appropriate and best fit.
- Evaluate the degree of delegation of control and also identify the responsibility centres.
- Establish the performance measures, both financial and non-financial and target for each measure.
- Review the performance with the help of Key Performance Indicators (KPI) and take corrective action, if required.

A good performance measure should -

- Provide incentive to the divisional manager to make decisions which are in the best interests of the overall company (goal congruence).
- Only include factors for which the divisional manager can be held accountable.
- Recognise the long-term objectives as well as short-term objectives of the organisation.

Question 1 : [Jan. 2021 Exam - 10 Marks]

Mr. Benn, oversees the diverse operations of Bennsys, a large multinational company by using a much decentralized management structure. According to its 2019 annual report, Bennsys had 1,25,000 employees and earned over \$100 billion in revenue. Mr. Benn managed this empire from his headquarters in London, that consists of 20 employees and occupies only 10,000 square feet, although the company's vice-chairman, Simon, who works out of London, occupies another 600 square feet.

The total payroll, including benefits of both locations was only just above \$2 million in 2019. Mr. Benn was invited as the chief guest in a business summit organized at New Delhi during March, 2020. Asked about how an organization of that magnitude could be managed with such a small resources as to space and manpower. Mr. Benn's own description about his and Mr. Simon's management style is, "we delegate almost to the point of abdication (renouncing everything)." An exaggeration perhaps, but clearly a decentralized style and he and his deputy are the stable believers of FOUR recognized levels of decentralization.

In the context of responsibility accounting, DISCUSS the levels of decentralization which Mr. Benn was referring to and do you concede to the view that Mr. Benn is exaggerating the success of his Divisional organization structure.

Answer 1 :

In a business context, **decentralisation** is the delegation of decision-making authority to smaller local units at lower levels of the organisation. This takes some control away from the hub and will often result in an upward flow of information – the opposite of what happens in a centralised organisation. An organisation with divisional structure has various divisions operating autonomously as business under a broad corporate framework according to geographical areas, markets or products and services. Thereby limiting the centralized monitoring and scrutinizing of each and every element of functioning. This would spare the top management from deploying time and efforts by sitting on the top at gigantic corporate offices. 'Bennsys' is a good example of decentralised business. Mr. Benn is managing a staff of over 1,25,000 persons which is earning revenue over \$100 billion in revenue with small resources.

Responsibility accounting is apt where top management has a willingness to delegate the authority to make decisions. The idea behind the responsibility accounting is that each manager's performance should be judged by how well he or she manages those items under his or her control. There are four recognised levels of decentralisation in the context of responsibility accounting which Mr. Benn was referring to and are detailed below :

Revenue Centre managers are having control over the generation of revenue from operation with no responsibility for costs.

Cost Centre managers exercise control over costs but not revenue and investments. Their responsibility is to minimize the cost of producing a specified level of output or the cost of providing a specified level of service. The objective of cost centre managers is to improve the efficiency of operations by finding ways to cut costs and minimize waste.

Profit Centre managers are having focus on profit. Their goal is to both maximize revenues and to minimize costs.

Managers of **Investment Centre** make decisions that influence costs, revenues, and investments. Their responsibility is to maximize the returns from invested capital, or to put the capital invested by owners and shareholders of their organizations to the best profitable use.

Organizations vary considerably in the **extent to which they decentralize** because decisions about whether and how much to decentralize involve numerous costs and benefits. Moreover, the scale of these costs and benefits depends on specific facts. A major chunk of top

management's responsibility is to find out how to maximize the benefits and minimize the costs associated with decentralization. An organisation can increase benefits by carefully identifying the decisions under each manager's purview, matching the scope of decisions with the manager's skills and knowledge. It can also help lower-level managers in understanding the firm's values, goals, and strategy. Mr. Benn clearly expressed the management style that has focus on abdication (i.e. giving up or renouncing the authority). Abdication, like delegation, involves allocating duties and responsibilities to a team – but without the measuring and managing part. It sounds reasonable to believe that Mr. Benn's style of functioning leads to the decentralization of decision-making process wherein the divisional heads are free to set selling prices, choose which markets to tap in, make product mix and output decisions and select suppliers.

If decentralized business model is ideally crafted to suit the desired style of functioning, how voluminous the organisation be, could be well managed by the top management by occupying reasonably small space with very minimum number of employees and act on the basis of management by exception.

METHODS OF PERFORMANCE MEASUREMENT

Types of Divisional Performance Measures :

There are various ways to measure the performance of each division or department. These performance measures can be broadly classified into the following two categories –

1. Financial Measures

- (a) Return on Investment (ROI) Method
- (b) Residual Income (RI) Method
- (c) Economic Value Added (EVA) Method

2. Non Financial Measures

- (a) Balanced Scorecard Method
- (b) The Performance Pyramid Method
- (c) Building Block Model
- (d) The Performance Prism
- (e) Triple Bottom Line (TBL) Method

Let's discuss them one by one in more details :

Return on Investment (ROI) Method

Instead of focusing purely on the absolute size of a division's profits, most organizations focus on the ROI of a division. ROI expresses divisional profit as a percentage of the assets employed in the division. Assets employed can be defined as total divisional assets, assets controllable by the divisional manager or net assets. ROI is a common measure and thus is ideal for comparison across corporate divisions for companies of similar size and in similar sectors.

Goal Congruence

One common problem in comparing the divisional performance is that, every divisional manager will try to improve the performance of his own division. But in the process, he may ignore the overall performance of the organisation. When our actions and decisions lead to the overall benefit of the entire organisation, then it is known as goal congruence.

In other words, evaluating divisional managers on the basis of ROI may not always encourage goal congruence. Consider the following example:

Particulars	Division A	Division B
(a) Proposed Project Investment	₹ 20 lacs	₹ 20 lacs
(b) Expected Profit	₹ 2.0 lacs	₹ 1.4 lacs
(c) Return on the Proposed Project	10%	7%
(d) Present ROI of Divisions	13%	5%
(e) Overall Cost of Capital of the company	8%	

The manager of division A would be unwilling to invest an additional ₹20 lacs because the return on the proposed project is 10% and this would decrease the present ROI of 13%. On the other hand, the manager of division B would wish to invest the ₹20 lacs because the return on the proposed project of 7% is in excess of the present ROI of 5%, and it would increase the division's average ROI.

The managers of both divisions would make decisions that would not be in the best interest of the company. The company should accept only those projects where the ROI > Cost of Capital (8%), but the manager of division A would reject a possible return of 10% and the manager of division B would accept a possible return of 7%. ROI can therefore lead to a lack of goal congruence.

Residual Income (RI) Method

To overcome some of the dysfunctional consequences of ROI, the residual income approach can be used. For the purpose of evaluating the performance of divisional managers, residual income is defined as controllable contribution less a cost of capital on the investment controllable by the divisional manager.

If residual income is used to measure the managerial performance of investment centres, there is a greater probability that managers will be encouraged to act in the best interests of the company in addition to their personal interest. Returning to our previous example in respect of the investment decision for divisions A and B, the residual income calculations are as follows:

Particulars	Division A ₹ lacs	Division B ₹ lacs
(a) Proposed Investment	20.00	20.00
(b) Controllable Contribution	2.00	1.40
(c) Cost of Capital @ 8% of (a)	1.60	1.60
(d) Residual Income [b – c]	0.40	– 0.20

This calculation indicates that the residual income of division A will increase and that of division B will decrease if both managers accept the project. Therefore, the manager of division A would invest, whereas the manager of division B would not. These actions are in the best interests of the company as a whole.

Residual income suffers from the disadvantages of being an absolute measure, which means that it is difficult to compare the performance of a division with that of other divisions or companies of a different size. For example, a large division is likely to earn a larger residual income than a small division. To overcome this deficiency, targeted or budgeted levels of residual income should be set for each division that are consistent with asset size and the market conditions of the divisions.

Question 2 : [RTP - May 2018] - ROI vs RI

The following data pertain to two divisions W_1 and W_2 , of a large Shipping Company.

Particulars	W_1 (₹)	W_2 (₹)
Profit	1,20,00,000	31,20,000
Investment	9,60,00,000	1,56,00,000

Cost of Capital is 10%.

Required :

INTERPRET the conflicting results based on financial performance measure ROI and RI.

Solution 2 :

Particulars	W_1 (₹)	W_2 (₹)
(a) Profit	1,20,00,000	31,20,000
(b) Investment	9,60,00,000	1,56,00,000
(c) ROI [a/b x 100]	12.5%	20%
(d) Cost of capital [10% x b]	96,00,000	15,60,000
(e) Residual Income (RI) [a – d]	24,00,000	15,60,000

Interpretation & Observation :

- (a) Division W1 is generating higher residual income but division W2 is generating higher ROI. It is due to larger size of division W1. Investment in W1 is more than 6 times that of W2. Hence, the performance of two divisions is not comparable on the basis of residual income method. A division having larger investment will always have larger residual income.
- (b) The correct comparison shall be return on investment (ROI) based. Because, ROI nullifies the effect of investment size and the return on investment is calculated for a common base. We can conclude that division W2 is utilizing the funds in a better manner as compared to division W1.
- (c) Thus, RI is not a good way to compare divisions that differ greatly on size.

Question 3 : [RTP - Nov. 2018]

BYD Alloy Ltd. first opened its door in 1990 for business and now it is a major supplier of metals supporting over a dozen different industries and employs experts to support each industry. These include Wood & Panel Products Manufacturing, Health Products, Site Furnishings, Commercial and Residential Construction etc. It has grown through devotion to its customers, dedication to customer service and commitment to quality products.

The company has two divisions: Division 'Y' and Division 'D'. Each division works as an investment centre separately. Salary of each divisional manager is ₹ 7,20,000 per annum with the addition of an annual performance related bonus based on divisional return on investment (ROI). A minimum ROI of 12% p.a. is expected to be achieved by each divisional manager. If a manager only achieves the 12% target, he will not be rewarded a bonus. However, for every whole 1% point above 12%, which the division achieves for the year, a bonus equal to 3% of annual salary will be paid subject to a maximum bonus of 20% of annual salary. The figures belonging to the year ended 31 March 2018 are given below :

Particulars	Division 'Y' ('000)	Division 'D' ('000)
Revenue	29,000	17,400
Profit	5,290	3,940
Less: Head Office Cost	(2,530)	(1,368)
Net Profit	2,760	2,572
Non - Current Assets	19,520	29,960
Cash, Inventory, and Trade Receivable	4,960	6,520
Trade Payable	5,920	2,800
Manager Responsible	HAI	FAI

During the financial year 2017-18, FAI, manager of Division 'D' invested ₹ 13.6 million in new equipment including an advanced cutting machine, which will increase productivity by 10% per annum. HAI, manager of Division 'Y', has made no investment during the year, even its computer system needs updation. Division 'Y's manager has already delayed payments of its suppliers due to limited cash & bank balance although the cash balance at Division 'Y' is still better than that of Division 'D'.

Required :

- (i) For each division, COMPUTE, ROI for the year ending 31 March 2018. Justify the figures used in your calculation. [6 Marks]
- (ii) COMPUTE bonus of each manager for the year ended 31 March 2018. [4 Marks]

- (iii) DISCUSS whether ROI provides justifiable basis for computing the bonuses of managers and the problems arising from its use at BYD for the year ended 31 March 2018. [10 Marks]

Answer 3 :

(i) Calculation of ROI & Bonus :

Particulars	Division 'Y' ('000)	Division 'D' ('000)
(a) Revenue	29,000	17,400
(b) Profit (Controllable)	5,290	3,940
(c) Non - Current Assets	19,520	29,960
(d) Cash, Inventory, and Trade Receivable	4,960	6,520
(e) Trade Payable	5,920	2,800
(f) Net Investment [c + d - e]	18,560	33,680
(g) ROI [b / f x 100]	28.50%	11.70%
(h) Performance above 12% [g - 12%]	16.50%	NIL
(i) Excess performance in whole % points	16%	NIL
(j) Bonus % of Annual Salary [i x 3%]	48%	NIL

Justification :

In computation of ROI of both division, controllable profit has been taken into consideration. The reason behind this is that the Head Office costs are not controllable and responsibility accounting considers that managers should only be held responsible for costs over which they have control. The assets figures being used also depend on the same principal. Figures of non-current assets, current assets and the current liabilities have been taken into consideration as they are such items over which managers have complete control.

(ii) Calculation of Bonus :

Division 'Y' Manager HAI -

Eligible Bonus (as per working above) = ₹ 7,20,000 × 48% = ₹ 3,45,600

However, Maximum Bonus = ₹ 7,20,000 × 20% = ₹ 1,44,000

Therefore, manager will be paid the bonus of ₹ 1,44,000 (max.)

Division 'D' Manager FAI -

Performance below target, hence Bonus = NIL

(iii) Discussion :

FAI will not receive any bonus since he has not earned any point above minimum percentage. This is due to the large asset base on which the ROI figure has been computed. Total assets of Division 'D' are almost double the total assets of Division 'Y'. The major reason behind this is that Division 'D' invested ₹ 13.6 million in new equipment during the year.

If this investment were not made, net assets would have been only ₹ 20.08 million and the ROI for Division 'D' would have been 19.62% resulting in payment of a bonus ₹ 1,44,000 (21% × ₹ 7,20,000 = ₹ 1,51,200; subject to maximum of ₹ 1,44,000) rather than nothing. FAI is being penalized for making decisions which are in the best interest of his division. It is very

surprising that he decided to invest, whereas he knew that he would receive lesser bonus subsequently. He acted in the best interests of the BYD altogether. On the other hand, HAI has taken benefit from the fact that he has not invested anything even though it was needed for computer system updation. This is an example of sub-optimal decision making.

Further, Division 'Y's trade payables are over double those of Division 'D'. Higher trade payable leads to reduction in net assets figures and consequently higher ROI. The fact that BYD is rewarding HAI with bonus, even though relationships with suppliers may be badly affected, is again a case of sub-optimal decision making.

If the profit margin (excluding head office cost) as percentage of sales is calculated, it comes to 18.24% for Division 'Y' and 22.64% for Division 'D'. Therefore it can be seen that Division 'D' is performing better if capital employed is ignored. ROI is simply making the division 'D's performance worse.

FAI might feel extremely disappointed by getting nothing and in the future, he may opt to postpone the investment to increase the bonus. Not investing in new technology and equipment will mean that the BYD will not be kept updated with industry changes and its overall future competitiveness will be affected.

Briefly, the use of ROI is resulting in sub-optimal decision making and a lack of goal congruence i.e. what is good for the managers is not good for the company and vice versa. Fortunately, Division 'D's manager still seems to be acting for the benefit of the BYD but the other manager is not. The fact that one manager is receiving a much bigger bonus than the other is not justifiable here and may result in conflict in long run. This is disappointing for the company especially in the situation when the divisions need to work in unison.

Economic Value Added (EVA)

In practice, many organizations use profit-based measures as the primary measure of their financial performance. There are two problems of using profit as performance criteria. These are:

- ☐ Profit ignores the cost of equity capital. Companies only generate wealth when they generate a return in excess of the return required by providers of capital – both equity and debt. In financial statements, the calculation of profit does take into account the cost of debt finance (i.e. interest), but ignores the cost of equity finance.
- ☐ Profits calculated in accordance with accounting standards do not truly reflect the wealth that has been created, and are subject to manipulation by accountants.

EVA is a performance measurement system that aims to overcome both these weaknesses.

Economic Value Added is a measure of economic profit. Economic Value Added is calculated as the difference between the Net Operating Profit After Tax (NOPAT) and the Opportunity Cost of Invested Capital. This opportunity cost is determined by multiplying the Weighted Average Cost of Debt and Equity Capital (WACC) with the amount of Capital Employed.

$$\text{EVA} = \text{NOPAT} - (\text{WACC} \times \text{Capital Employed})$$

EVA in brief is the profit earned over and above the cost of capital. Positive EVA indicates that the company is earning surplus profit after deducting the cost of using funds in the business.

Calculation of NOPAT

NOPAT means Net Operating Profit After Tax. It can be calculated in following different ways –

- $\text{NOPAT} = \text{EBIT} - (\text{Tax Rate} \times \text{EBIT})$
- $\text{NOPAT} = \text{PAT} + \text{Interest cost, net of tax i.e. } [\text{Interest} \times (1 - \text{TR})]$
- $\text{NOPAT} = \text{EBIT} - [\text{Income Tax} + \text{Tax saving on interest}]$

Question 4 :

From the following income statement, calculate NOPAT.

Particulars	₹
EBIT	10,000
Less : Interest on debt	2,000
∴ EBT	8,000
Less : Tax @ 30%	2,400
∴ PAT	5,600

Question 5 :

Calculate WACC using the following data and CAPM model –

Equity Share Capital	₹ 25,000
8% Debentures	₹ 25,000
Tax Rate	30%
Risk free rate of return	6% (i.e. interest on GOI bonds)
Risk Premium	4% (i.e. $R_m - R_f$)
Beta risk factor	1.5

Question 6 :

Using the combined data given in Question No. 4 & 5 above, calculate EVA.

Question 7 : [ICAI Module]

From the following data of division X, calculate EVA.

Net operating profit before interest and tax	₹ 7,500
Capital employed	₹ 12,500
WACC	8%
Tax Rate	30%

Question 8 :

Calculate EVA from the following data for PQR Ltd.

Equity Capital	₹ 100 lakhs
8% Secured Loan	₹ 20 lakhs
10% Unsecured Loan	₹ 30 lakhs
Profit after tax	₹ 15.80 lakhs
Cost of equity	12%
Tax Rate	40%

Question 9 : [ICAI Module]

XYZ Ltd. Provides you with the following financial information as at 31st March 2018.

(₹ in lakhs)	
Share Capital	981.46
Reserves and Surplus	1,313.62
Long Term Debt	144.44
Trade Payables	20.38

Additional information provided is as follows:

- (i) Profit before interest and tax is ₹ 2,202.84 lakhs.
- (ii) Interest paid is ₹ 13.48 lakhs.
- (iii) Tax rate is 30%
- (iv) Cost of equity = 12.42% and cost of debt = 6.53%

Required :

CALCULATE Economic Value Added of XYZ Ltd.

Solution 9 :**1. Calculation of NOPAT :**

(₹ in lakhs)	
PBIT (given)	2,202.84
Less : Interest	(13.48)
PBT	2,189.36
Less: Tax @ 30%	(656.81)
PAT	1,532.55
Add: Interest (net of tax) [13.48 x (1 – 0.30)]	9.44
NOPAT	1,541.99

$$\begin{aligned} \text{*Shortcut for NOPAT} &= \text{PBIT} - (\text{Tax Rate} \times \text{PBIT}) \\ &= 2,202.84 - 30\% = 1,541.99 \text{ lakhs (approx)} \end{aligned}$$

2. Calculation of WACC :

$$\begin{aligned} \text{Capital Employed} &= ₹ 981.46 \text{ L} + ₹ 1313.62 \text{ L} + ₹ 144.44 \text{ L} \\ &= ₹ 2,439.52 \text{ L} \\ \text{WACC} &= (\text{Cost of Equity} \times \text{Prop. of Equity}) + (\text{Cost of Debt} \times \text{Prop. of Debt}) \\ &= \frac{(981.46 + 1,313.62)}{2,439.52} \times 12.42\% + \frac{(144.44)}{2,439.52} \times 6.53\% \\ &= 11.58\% + 0.39\% \\ &= 12.07\% \end{aligned}$$

3. Calculation of EVA :

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - (\text{WACC} \times \text{Capital Employed}) \\ &= ₹ 1,541.99 \text{ L} - (12.07\% \times ₹ 2,439.52 \text{ L}) \\ &= ₹ 1,247.54 \text{ L} \end{aligned}$$

$$\begin{aligned}
 \text{*Shortcut for EVA} &= \text{PAT} - \text{Cost of using Equity Funds} \\
 &= 1,532.55 \text{ L} - (12.42\% \times 2,295.08) \\
 &= 1,247.50 \text{ lakhs (approx)}
 \end{aligned}$$

Calculation of EVA as per Stern & Stewart Model :

ICAI has borrowed the concept of NOPAT and EVA from a foreign author **Stern & Stewart**. This concept was introduced by ICAI in the new module.

On careful study, I could gather some information and the way of calculation of EVA for you students. Please remember that the logical reasoning behind such calculations is not mentioned anywhere in the printed study material. I am providing below, a step by step calculation of NOPAT and EVA, so that you can solve such question, if it appears in the exam.

Calculation of NOPAT as per Stern & Stewart :

Particulars	Amount (₹)	Amount (₹)
Operating profit as per books of account (EBIT)		xxx
Add back :		
• Non cash items debited to P&L account	xxx	
• Accounting depreciation charged to P&L account	xxx	
• Provision for doubtful debts	xxx	
• Research & Development expenditure charged to P&L account, but whose benefit is yet to accrue	xxx	
• Marketing expenditure charged to P&L account, but whose benefit is yet to accrue	xxx	
• Training expenditure on staff charged to P&L account, but whose benefit is yet to accrue	xxx	xxx
Less :		
• Tax Paid in cash (not accrued or deferred tax)	xxx	
• Tax saving on interest on borrowings	xxx	
• Economic depreciation of assets (based on use)	xxx	xxx
NOPAT		xxx

Calculation of Adjusted Capital Employed as per Stern & Stewart :

Particulars	Amount (₹)	Amount (₹)
Opening Capital Employed as per books of account		xxx
Addback : (adjustments of previous financial year)		
• Non cash items debited to P&L account	xxx	
• Accounting depreciation charged to P&L account	xxx	
• Provision for doubtful debts	xxx	
• Research & Development expenditure charged to P&L account, but whose benefit is yet to accrue	xxx	
• Marketing expenditure charged to P&L account, but whose benefit is yet to accrue	xxx	

• Training expenditure on staff charged to P&L account, but whose benefit is yet to accrue	xxx	xxx
Less : (adjustments of previous financial year)		
• Economic depreciation of assets (based on use)		xxx
Adjusted Opening Capital Employed		xxx

Note : Stern & Stewart uses the figure of opening capital employed for calculation of EVA and not the Closing CE or Average CE. He feels that the investments made during the current year will take atleast one year to generate realistic returns for the business. Hence, opening capital employed should be considered for calculation of EVA as follows :

Hence,
$$\text{EVA} = \text{NOPAT} - (\text{WACC} \times \text{Op. Adj. CE})$$

Question 10 : [ICAI Module]

Beta Control (BC) is a global leader in manufacturing of commercial building control systems with over 250 distributors and many thousands of installations in more than 50 countries. Control systems involve air conditioning systems, facility management, energy and water management, access control and security controls etc. At BC, manufacturing is done at a number of factory sites where some products are easy and largely produced and have a long life while other products are intricate and have a short life due to changing technologies. BC's mission statement is 'to keep you ahead through control systems that improve productivity and save energy'.

A Newly appointed chief executive officer (CEO) is anxious about declining share price of BC in the last two years. She identified that the business has grown through acquisition and senior management have focused on making corporate deals but not on making control systems. She announced that the BC's focus must be on optimization and upgradation of its value generation rather than just getting bigger through acquisitions.

Assuming yourself as a performance management expert of BC, the CEO has asked you to aid her in her improvement programme. Firstly, she want your views on the use of EVA as the key performance metric at BC. You are given the current EVA computation (Annexure 1) but there is some suspicion about whether the assistant who has done this work is sufficiently well trained about this method. So, she requires you to examine his accuracy and the assumptions forming part of the calculation.

Required :

Write a report to the chief executive officer to EVALUATE the accuracy of the EVA calculation and the assumptions.

Annexure 1 - NOPAT

Particulars	Year ended 31 st March 2019	
	₹ In Lakhs	Notes
Operating Profit	1,102.80	
Add :		
Non-Cash Expenses	30.20	
Marketing Expenditure Capitalised	46.20	7
Less :		
Tax	269.60	9
Tax Relief on Interest	48.96	
Net Operating Profit After Tax (NOPAT)	860.64	

Capital Employed

Particulars	Year ended 31 st March 2019	
	₹ In Lakhs	Notes
From the Statement of Financial Position	4,802.00	10
Add :		
Marketing Expenditure Capitalized	46.20	7
Adjusted Capital Employed	4,848.20	

$$WACC = (1/2 \times 15\%) + (1/2 \times 7.8\%)$$

$$= 11.40\%$$

$$EVA = NOPAT - (WACC \times \text{Capital Employed})$$

$$= ₹ 860.64 \text{ L} - (₹ 4,848.20 \text{ L} \times 11.40\%)$$

$$= ₹ 860.64 \text{ L} - ₹ 552.69 \text{ L}$$

$$= ₹ 307.95 \text{ Lakhs}$$

Assumptions and Notes :

1. Debt/Equity 1 : 1
2. Cost of Equity is 15%
3. Cost of Debt (pre-tax) is 7.8%
4. Tax Rate is 30%
5. Interest charged in the period was ₹ 163.20 L
6. In current fiscal year, BC spend ₹ 80 L in Training and Development by leveraging the latest digital technologies including virtual classrooms to deliver highly relevant training to staff at the point of need.
7. Marketing Expenditure has been ₹ 46.20 L each year for the last two years to build the long-term brand.
8. The total R&D spending was ₹ 20 L during this year for in-depth study the TCP/IP protocols. The TCP/IP based products have not been launched yet.
9. BC has paid Tax of ₹ 260 L while the tax charged as per accounts was ₹ 269.60 L.
10. Capital employed during the Period (from the statement of financial position) :
 Opening = 4,564.00 lakhs
 Closing = 4,802.00 lakhs

Solution 10 :**Report**

To : CEO, Beta Control

From : Performance Management Expert

Date : 31st May 2019

Subject : Evaluation of EVA at Beta Control

EVA provides a link between decisions, performance measures and rewards, which focuses managers on performing better. Incentive schemes based on EVA provide better quality information and motivation in making decision which in turn maximise shareholder's wealth. In other words, EVA links the operating returns to the assets that were used to generate those returns. The learning which flows from EVA analyses can be useful and can allow the manager not only to identify areas of weakness in performance but also to easily find solutions. BC is a multiproduct company having number of factory sites. EVA can help to appraise divisional contributors to, or detractors from, overall profitability. Thus, managers may be educated through EVA and pursue such objectives that improves operating profits by investing more capital.

In addition, this report deals with evaluation of the accuracy and assumptions used in the calculation of BC's EVA. There are many errors in the present calculation of EVA. These have been discussed below and revised calculations are enclosed.

- Non-cash Expenses have been correctly added back to the profit as these are expenses which do not affect the cash flow of a given period.
- Adding back of Marketing Expenditure is also correct as this spending contributes to future value-creation. For the same reason, the prior year's spending is also added in to capital employed.
- Training and Development Expenses should be capitalised. Training and Development Expenses have been treated as an expense in the income statement, they should be added back to profit, and added to capital employed (at the end of the year).
- Research and Development (R & D) Expenses should be treated as marketing expenditure for long period and hence it is required to be added back.
- The tax expenses in the EVA calculation should be the tax paid with adjustment for tax relief on interest and not the adjusted amount of tax charged in the accounts.
- The WACC is incorrect because it should be based on post-tax cost of debt. The cost of debt is wrongly taken as before tax.
- Generally, a company takes, at least, a year's time to earn a return on investment. Thus, the capital employed figure should be based on the beginning numbers.

Revised NOPAT :

Particulars	Year ended 31 st March 2019 ₹ in lakhs
Operating Profit	1,102.80
Add : Non-Cash Expenses	30.20
Marketing Expenditure Capitalised	46.20
Training & Development Expenses	80.00
R & D Expenses	20.00
Less : Tax Paid	260.00
Tax Relief on Interest [163.20 x 30%]	48.96
Net Operating Profit After Tax (NOPAT)	970.24

Revised Capital Employed :

Particulars	₹ in lakhs
Capital Employed (Opening) as per financial position	4,564.00
Add : Marketing Expenditure Capitalized (of last year)	46.20
Adjusted Capital Employed	4,610.20

$$\begin{aligned}
 \text{Revised WACC} &= (1/2 \times 15\%) + (1/2 \times 7.8\% \times 70\%) \\
 &= 10.23\% \\
 \text{Revised EVA} &= \text{NOPAT} - (\text{WACC} \times \text{Capital Employed}) \\
 &= ₹ 970.24 - (₹ 4,610.20 \times 10.23\%) \\
 &= ₹ 498.62 \text{ lakhs}
 \end{aligned}$$

Comments : The recomputed EVA has increased from ₹ 307.95 lakhs to ₹ 498.62 lakhs, which shows a positive position for BC as it adds up the shareholder's wealth.

Question 11 : [ICAI Module]

[Same question also appeared in November, 2020 exam with name changed as : Jal Cleaning and Distribution Services Ltd. (JCDSL)]

Water Utilities Services (WUS) is established with an aim for supply and distribution of water in Mumbai as well as supply of water to the various local authorities for distribution to villages and other small cities adjacent to Mumbai. This involved planning, operating, treating, maintaining, and distributing water resources in the country's urban centres and other areas mandated by Maharashtra Government. Its mission is "To provide sustainable water in a cost effective and environmental friendly manner to the economy".

The government ensures that WUS does not take advantage of its monopoly position in the regional area by increasing prices. The government controls majority of services through its water regulatory body which determines an acceptable margin level (ROCE) and ensures that the pricing of WUS within these areas does not break this level. The remaining work i.e. a water bottle operation (WBO) is not regulated by government and WUS charges a market rate for water supply in bottle. The regulator compute return on capital employed (ROCE) of WUS based on its own valuation of the capital assets which are used in operation and the profit from those services.

Acceptable level of ROCE set by the regulator is 7.00%. If WUS breach this level, then the company would be penalized. WUS board is trying to improve the performance for the benefit of the shareholders. In order to communicate the objective of maximizing shareholders' wealth, the directors have decided to consider economic value added (EVA) as the key performance indicator.

Compute EVA of WUS based on the following information for the year ending 31 March 2019 :

Particulars	Water Distribution Operation (WDO)	Water Bottle Operation (WBO)	Total
	₹ in Crore	₹ in Crore	₹ in Crore
Revenue	555.00	186.00	741.00
Less: Operating Cost	460.00	119.00	579.00
Operating Profit	95.00	67.00	162.00
Less: Finance Charges			46.00
Profit Before Tax			116.00
Less: Tax at 30%			34.80
Profit After Tax			81.20
Capital Employed	2018-19	2017-18	
	₹ in Crore	₹ in Crore	
Audited Accounts	1,616.20	1,495.00	
Determined by the Regulator (for WDO Only)	1,558.00	1,422.00	

Notes :

1. Operating Costs includes :

Particulars	2018-19	2017-18
	₹ in Crore	₹ in Crore
Depreciation	118	114
Provision for doubtful debts	4	1
Research and Development	24	—
Other non-cash items	14	12

- Economic depreciation is ₹166 Crore in 2018-19. In FY 2017-18, economic and accounting depreciation were assumed to be the same.
- Current year tax paid is (₹18 Crore) and deferred tax provisions of ₹1.50 crore has been adjusted. There was no deferred tax balance before 2018-19. The provision for doubtful debts was ₹ 9 crore in the 2018-19 balance sheet.
- Research and development has been non-capitalized. It belongs to a new project that will be developed over five years and is expected to be of long-term benefit to the company. 2018-19 is the first year of this project.
- Cost of Capital :

Equity 14%;

Debt (Pre-Tax) 6%

6. Gearing of WUS :

Equity 45%; Debt 55%

Required :

- (i) EVALUATE the financial performance of WUS using EVA.
- (ii) ASSESS whether WUS comply with its acceptable ROCE level.
- (iii) Advise on how to improve profitability.

Solution 11 :

(i) **Computation of NOPAT for the Company WUS :**

Particulars	₹ in Crore
Operating Profit for 2018-19	162.00
Add :	
Non-Cash Items	14.00
Accounting Depreciation	118.00
Provision for Doubtful Debts	4.00
Research and Development	24.00
Less :	
Economic Depreciation	166.00
Tax Paid	18.00
Tax Saving on Interest (₹ 46 × 30%)	13.80
NOPAT for 2018-19	124.20

Computation of Capital Employed for WUS :

Particulars	₹ in Crore
Capital Employed as on 31.03.2018 (Opening)	1,495.00
Add :	
Provision for Doubtful Debt as on 31.03.2018 [9 cr. - 4 cr.]	5.00
Other Non-Cash Items (incurred in 2017-18)	12.00
Adjusted Opening Capital Employed on 31.03.2018	1,512.00

$$\begin{aligned} \text{WACC} &= [0.45 \times 14\%] + [0.55 \times 6\% \times (1 - 0.3)] \\ &= 6.3\% + 2.31\% = 8.61\% \end{aligned}$$

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - (\text{WACC} \times \text{Op. Capital Employed}) \\ &= 124.20 - (1,512 \times 8.61\%) \\ &= 124.20 - 130.18 = -5.98 \text{ Crores (Negative EVA)} \end{aligned}$$

Evaluation :

Presently, WUS is distorting value as it is not able to meet the economic cost of its own capital. This put the company into the question of perpetual succession and lead the company against shareholder's interest. The reason could be a higher cost of equity for WUS. The investing risk should be low since 75% of the services that the company renders are important for the economy and demand is guaranteed in future. Optionally, WUS needs to either increase its NOPAT enough for break even on economic value added or slash its capital employed by selling unutilized or under-utilized assets.

(ii) Regulatory ROCE : (Target 7.00%)

$$\begin{aligned}\text{ROCE} &= (\text{Operating Profit} / \text{Capital Employed}) \times 100 \\ &= (95 / 1,422) \times 100 = 6.68\%\end{aligned}$$

The ROCE is within the acceptable limit of 7.00%.

My Observations & Comments :

1. It should be mentioned that ROCE is to be calculated for WDO only. Because, capital employed is given for WDO only.
2. While calculating ROCE, Operating profit is taken for 2018-19 and Capital Employed is taken for 2017-18. That is opening capital employed is considered, using the logic of Stern Stewart.

(iii) Operating Margins

Water Distribution Operation = 17.12%

Water Bottle Operation = 36.02%

My Observations & Comments :

1. Formula and working for operating margin is not given in the answer.
2. It is calculated as $(\text{Operating Profit} / \text{Revenue}) \times 100$
For WDO = $(95 / 555) \times 100 = 17.12\%$ and
For WBO = $(67 / 186) \times 100 = 36.02\%$.

Advise :

Operating margin from WBO is 36.02% compared to 17.12% (WDO). WUS may use the WDO activities as a trusted source of cash profit to reinvest in expansion of the WBO. Expansion through acquisition of appropriate non-regulated businesses using the cash generated by the regulated activities might be a good decision.

Further, WUS may improve profitability by controlling costs within WDO activities through performance measurement. The regulatory body cannot argue that the company is overcharging its customers to increase profit margin. This is possible through strict observance of expenses and using cost savings techniques through efficiency improvements. In order to control cost within WDO, targets should be based on minimal variances and adopting cost cutting methods.

Overall, In WDO, there is only a limited scope for increase in the operating profit since the maximum operating profit allowed is ₹ 99.54 crore i.e. (7% of ₹ 1,422 crore) of capital employed. Thus, WUS should go to expand its WBO as this is producing higher operating profit margins.

Triple Bottom Line (TBL)

"Bottom Line" is the word used in business world to indicate the profit of an organisation and "Top Line" is the word used in business world to indicate sales of an organisation. In our profit statement, we generally start with sales at the top and we reach to net profit at the bottom.

TBL expands traditional accountancy reporting systems, looking at social and environmental performance, rather than simply financial performance. This can be used to help and encourage divisional managers to act in a socially responsible manner. TBL incorporates the three dimensions, called as 3P's -

- **Environmental (Planet)** – It measures the impact on resources, such as air, water, ground and waste emissions.
- **Social (People)** – It relates to corporate governance, motivation, incentives, health and safety, human capital development, human rights and ethical behaviour.
- **Economical (Profit)** – It refers to measures maintaining or improving the company's success.

Note : The above three are popularly called as **Planet, People & Profit** respectively.

Question 12 : [ICAI Website]

CAREGIVER LTD. is a multi-specialty hospital in a mid-sized town. A 300+ bedded facility offers treatment across all medical disciplines of Cardiac, Oncology (Medical, Surgical and Radiotherapy), Neurosciences, Urology, Nephrology, Kidney Transplant, Aesthetics and Reconstructive Surgery, and other ancillary services. Most of the community members have their livelihood linked with the hospital. Many of them are directly employed at the hospital as doctors, nursing staff, lab technicians or as other support staff. While, others are indirectly related as suppliers of medical devices or drugs to the hospital, catering or housekeeping contractors etc. for the hospital. Hence, existence of the hospital is vital to the community. Growing awareness about sustainable business prompted the management to identify areas that can help the hospital operate in a sustainable manner that would be mutually beneficial to the organization as well as the town that depends on it. Therefore, it has identified the initiatives that have been put in place to create a sustainable business. Information captured from various departments are being considered to prepare the Triple Bottom Line (TBL) report that is for the consumption both to internal and external stakeholders.

Required :

IDENTIFY, which of the following aspects need to be reported in the TBL report and under which of the three categories. Provide reasons for classifying the aspect under a specific category, if applicable.

- (i) Medical staff conduct charity camps every month. Open to all members of the community, who are provided with consultation free of charge.
- (ii) Prompt and accurate tax payments based on records maintained without errors or fraud.
- (iii) Caregiver, with the help of traffic police, has implemented a "green corridor" for ambulances that carry donor organs for transplantation. Organs harvested from the donor at one hospital can reach another hospital with the recipient patient at the earliest.
- (iv) Medical waste is discarded at a landfill in a nearby dumpsite. Some of the waste are not bio-degradable.
- (v) During review of the supplier for housekeeping service, it was observed that the service provider resorted to child labor to keep cost of operations lower.
- (vi) Training and professional development programs for doctors and nurses.
- (vii) Lab reports are being made available online within the hospital computer system. This would reduce printing costs and storage space needed to maintain older records.

- (viii) Caregiver has a good track record of having no medical negligence litigation cases filed against it.
- (ix) The hospital is planning to market medical check-up packages so that facilities in its outpatient department can be utilized better.
- (x) The number of inpatient hospital deaths decreased by around 8%, that is from 776 in 2016 to 715 in 2017.

Assume all aspects are material enough to be reported in the TBL report.

Solution 12 :

Aspects that need to be reported in the TBL report :

S.N.	Aspect	Category for TBL Report & Reason
(i)	Medical staff conduct charity camps every month. Open to all members of the community, who are provided with consultation free of charge.	Social bottom line, as it benefits the local community.
(ii)	Prompt and accurate tax payments based on records maintained without errors or fraud.	Economic bottom line, since tax payments impact an organization's profitability and money flow.
(iii)	Caregiver, with the help of traffic police, has implemented a "green corridor" for ambulances that carry donor organs for transplantation. Organs harvested from the donor at one hospital can reach another hospital with the recipient patient at the earliest.	Social bottom line, since green corridor would enable the ambulance to transport harvested organs between the hospitals at the earliest. This would be beneficial for patients in need of critical care.
(iv)	Medical waste is discarded at a landfill in a nearby dumpsite. Some of the waste are not bio-degradable.	Environmental bottom line, as it affects the ecological surroundings of the town.
(v)	During review of the supplier for housekeeping service, it was observed that the service provider resorted to child labor to keep cost of operations lower.	Social bottom line, since employing child labor leads to exploitation of children within the community.
(vi)	Training and professional development programs for doctors and nurses.	Social bottom line, since it contributes towards employee development.
(vii)	Lab reports are being made available online within the hospital computer system. This would reduce printing costs and storage space needed to maintain older records.	Environmental bottom line, since paper, cartridge and storage requirement would be lower. This preserves environmental resources.
(viii)	Caregiver has a good track record of having no medical negligence litigation cases filed against it.	Social bottom line, since this is an indicator of the quality of services provided to patients.
(ix)	The hospital is planning to market 'medical check-up packages' so that facilities in its outpatient department can be utilized better.	Economical bottom line, since it will help in improving profitability of the hospital and patients will get the services at lower cost.
(x)	The number of inpatient hospital deaths decreased by around 8%, from 776 in 2016 to 715 in 2017.	Social bottom line, since hospital mortality rate measures the clinical quality.

Question 13 : [Nov. 2019 Exam]

The triple bottom line recognises that a company's performance should not only be viewed in terms of its ability to generate economic profits for its owners, but also by its impact on people and the planet for its long term economic and social viability. XYZ Limited has recently undertaken initiatives towards sustainability as below :

- (i) Reduced the amount of plastic usage in the peanut butter jars.
- (ii) Provided financial support to hospital run by local authority in the vicinity of the factory.
- (iii) Constructed solar powered warehouse.
- (iv) Generated profit for the company's shareholders.
- (v) Started child care unit for the benefit of women employees as well as for the neighbourhood community.

Required :

Identify whether this initiative would primarily impact people, planet or profit. [5 Marks]

Solution 13 :

Identification of initiatives undertaken by XYZ Ltd. into categories it would impact based on the Triple Bottom Line Model – People, Planet or Profit.

Reduced the amount of plastic usage in peanut butter jars.	Planet
Provided financial support to hospital run by local authority in the vicinity of the factory	People
Constructed solar powered warehouse	Planet
Generated profit for the company's shareholders	Profit
Started child care unit for the benefit of women employees as well as for the neighboring community	People

Vision Statement

Quote : “How can you lead if you do not know where are you going?” – George Newman

The Vision :

- Very early in the strategy making process, a company's senior managers struggle with the issue of what directional path the company should take and what changes in the company's product-market-customer-technology focus would improve its current market position and future prospects.
- Deciding to commit the company to one path versus another pushes managers to draw some carefully reasoned conclusions about how to try and modify the company's business make up to gain the market leadership.
- Top management's views and conclusions about the company's direction and the product-customer-market-technology focus constitute a strategic vision for the company.
- A strategic vision thus points an organisation in a particular direction, charts a strategic path for it to follow in preparing for the future and moulds organizational identity.
- A clearly articulated strategic vision communicates management's aspirations to stakeholders and helps steer the energies of company personnel in a common direction.
- **A strategic vision is a road map of a company's future –**
 - (a) providing specifics about technology and customer focus,
 - (b) the geographic and product markets to be pursued,
 - (c) the capabilities it plans to develop, and
 - (d) the kind of company that management is trying to create.
- **The three elements of strategic vision are –**
 - (a) Coming up with a mission statement that defines that business the company is presently in and conveys the essence of “who we are and where we are now?”
 - (b) Using mission statement as basis for deciding on a long term course making choices about “where we are going?”
 - (c) Communicating the strategic vision in clear, exciting terms that arouse organisation's wide commitment.

Mission Statement

- Vision and Mission statements are sometimes so overlapping and confusing that it becomes very difficult to distinguish between the two. Really speaking, there is hardly any difference between the two.
- However, on careful study, one will notice that a Corporate Vision is expressed or spelt out through the Mission statement. It means, Vision comes alive through the Mission. They are complementary to each other.
- Vision is more general in nature and Mission is more specific in nature.
- Mission is what an organisation is and why it exists.
- The corporate mission is an expression of the growth ambition of the firm.
- It is in fact the firm's future visualized.
- It provides a dramatic picture of what the company wants to become.
- It is the corporation's dream crystallized.

- It is a colorful sketch of how the firm wants its future to look, irrespective of the current position.
- In simple words, the mission is a grand design of the firm's future.

Features of Mission :

- Feasible – Though mission should aim high, it should be realistic and achievable.
- Precise – It should not be very narrow nor should be very lengthy.
- Clear – It should be clear enough to lead to action.
- Motivating – It should motivate employees to achieve the organizational goals.
- Unique – An organisation should be seen by the market and customers as different.

Importance and benefits of having a Mission :

- It ensures the commonness of the organisation goals i.e. unanimity of purpose.
- It provides a basis for allocating organizational resources.
- It motivates employees of the organisation to achieve their objectives.
- It provides purpose and direction to the organisation.
- It defines the purpose of your existence.
- It helps you to identify the business areas to explore.
- It helps you to identify the customers to be served.
- It provides you the geographical boundary to work within etc.

Objective & Goals

- Business organisation translates their vision and mission into objectives.
- We can say that the objectives & goals are more specific in nature as compared to the vision and mission of an organisation.
- Objectives & goals are used as synonymous to each other. Hence, these terms are used interchangeably in the practical world.
- However, objectives are open-ended and denote what we want to achieve in future. Goals are close-ended and are more precise and expressed in exact terms.
- Objectives are organisations performance targets, the results and outcomes it wants to achieve.
- Objectives and goals function as yardstick for tracking an organisations performance and progress.

Characteristics of Objectives & Goals :

- Objectives should define the organisation's relationship with its environment.
- They should be facilitative towards achievement of mission and purpose.
- They should provide the basis for strategic decision making.
- They should provide standards for performance appraisal.
- Objectives should be understandable.
- Objectives should be concrete and specific.
- Objectives should be related to a time frame.
- Objectives should be measurable and controllable.
- Objectives should be challenging.
- Different objectives should correlate with each other.
- Objectives should be set within constraints.

Some Examples of Vision & Mission Statement

ICAI

Vision : World's leading accounting body, a regulator and developer of trusted and independent professionals with world class competencies in accounting, assurance, taxation, finance and business advisory services.

Mission : ICAI will leverage technology and infrastructure and partner with its stakeholders to –

- Impart world class education, training and professional development opportunities to create global professionals
- Develop an independent and transparent regulatory mechanism that keeps pace with the changing times
- Ensure adherence to highest ethical standards
- Conduct cutting edge research and development in the areas of accounting, assurance, taxation, finance and business advisory services
- Establish ICAI members and firms as Indian multi-national service providers.

Reliance Industries

Vision : Through sustainable measures, create value for the nation, enhance quality of life across the entire socio-economic spectrum and help spearhead India as a global leader in the domains where we operate.

Mission :

- Create value for all stakeholders
- Grow through innovation
- Lead in good governance practices
- Use sustainability to drive product development and enhance operational efficiencies
- Ensure energy security of the nation
- Foster rural prosperity

Tata Power

Vision : To be the most admired and responsible integrated power company with international footprint, delivering sustainable value to all stakeholder.

Mission : We will become the most admired and responsible power company delivering sustainable value by –

- Operating our assets at benchmark levels
- Executing projects safely, with predictable benchmark quality, cost and time
- Growing the Tata Power businesses, be it across the value chain or across geographies, and also in allied or new businesses.
- Driving organizational transformation that will make us have the conviction and capabilities to deliver on our strategic intent.
- Achieving our sustainability intent of 'Leadership with Care', by having leading and best practices on care for the environment, care for the community, care for the customers and shareholders, and care for the people.

Tata Motors

Vision : To be a world class corporate constantly furthering the interest of all its stakeholders.

Mission :

- Shareholders – To consistently create shareholder value by generating returns in excess of WACC during the upturn and at least equal to WACC during the downturn of the business cycle.
- Customers – To strengthen the Tata brand and create lasting relationships with the customers by working closely with the business partners to provide superior value for money over the life cycle.
- Employees – To create a seamless organisation that incubates and promotes innovation, excellence and the Tata core values.
- Vendor and Channel Partners – To foster a long term relationship so as to introduce a broad range of innovative products and services, that would benefit our customers and other stakeholders.
- Community – To proactively participate in reshaping the country's economic growth. To take a holistic approach towards environmental protection.

Symbiosis International University

VISION :

Symbiosis International University will be the preferred destination for all who aspire to excel.

MISSION : Lead value- based pioneering efforts to -

- Facilitate intellectual stimulation to generate, maintain and disseminate knowledge.
- Empower participants to meet the challenges of a collaborative and competitive globalised environment.
- Synergize excellences amongst aspirants through world-class ambience.
- Institute a culture of inclusiveness and provide wide access to higher education opportunities.
- Foster attitudes for a sustainable environment.
- Develop a unique University where the branches provide sustenance to the tree and bear fruits for all.
- Initiate trends, which impact global higher education policies and practices.

Bharat Sanchar Nigam Limited (BSNL)

Vision :

To become the largest telecom service provider in Asia.

Mission :

- To provide world class state of art technology telecom services to its customers on demand at competitive prices.
- To provide world class telecom infrastructure in its area of operation and to contribute to the growth of country's economy.

Infosys

Vision :

To be a globally respected corporation that provides best of breed business solutions, leveraging technology, delivered by best-in-class people.

Mission :

To achieve our objectives in an environment of fairness, honesty, and courtesy towards our clients, employees, vendors and society at large.

Bharat Heavy Electricals Limited (BHEL)

Vision : A global engineering enterprise providing solutions for a better tomorrow.

Mission : Providing sustainable business solutions in the fields of energy, industry and infrastructure.

ICICI BANK

Vision :

To be the leading provider of financial services in India and a major global bank.

Mission :

We will leverage our people, technology, speed and financial capital to -

- be the banker of first choice for our customers by delivering high quality, world-class products and services.
- expand the frontiers of our business globally.
- play a proactive role in the full realisation of India's potential.
- maintain a healthy financial profile and diversify our earnings across businesses and geographies.
- maintain high standards of governance and ethics.
- contribute positively to the various countries and markets in which we operate.
- create value for our stakeholders.

Lupin Pharmaceuticals

Vision :

Lupin's mission is to become a transnational pharmaceutical company through the development and introduction of a wide portfolio of branded and generic products in key markets.

Mission :

Lupin Pharmaceuticals, Inc. is committed to bringing innovative products for the healthcare professional to improve the health and well being of individuals.

Lupin Pharmaceuticals, Inc. is well positioned for growth in the US market. We can capitalize on the strengths of our parent company, Lupin Limited:

- Scientific expertise to develop new and improved products and product line extensions;
- Manufacturing technology, expertise and infrastructure;
- Financial resources.

Vision Statement of a CA Student

Vision :

To become a globally recognised finance professional.

Mission :

- To get the best qualification in the field of finance and accounts;
- To use the latest technology to provide best services to clients;
- To lead a balanced and purposeful life;
- To leave a legacy for my children and nation.

Objectives :

- To pass CA, CPA & CFA examinations;
- To obtain the best training experience in the field of finance & accounts;
- To become financially independent at an early age.

Goals :

- To become CA by 20XX;
- To become CPA by 20XX;
- To become CFA by 20XX;
- To do articleship training in one of the big four consultancy firms;
- To gain a work experience of atleast 2 years in an MNC;
- To utilise 2 hours daily for self updation;
- To give 1 hour daily for physical exercise & meditation;
- To accumulate a wealth of ₹ 50 crores by the age of 50.

Note : The above plan is a tentative and imaginary vision of a CA student. I request you to prepare your own vision & mission statement for your life, by taking clues from the above. Whenever you do it, do it with utmost sincerity and commitment.

Advantage : It will work as a written commitment with yourself and will help you to guide the path of your life. You may revise the plan after every 5 years, if required.

Balanced Score Card

Introduction :

The traditional performance reporting system focuses entirely on cost control. In today's worldwide competitive environment, companies are competing in terms of product quality, delivery, reliability, after sales service and customer satisfaction. None of these variables are directly measured by the traditional reporting system. Consider a situation where a purchasing department regularly achieved the budget for all expenses items. The responsibility performance reporting system therefore suggests that the department was well managed. However, the department provides a poor service to the production department. Traditional Accounting system report only details regarding the costs incurred by a department. They do not give information on quality of service it provides. The traditional reporting system therefore needs to be broadened to incorporate non-financial measures besides costs and revenues. These non-financial measures focus on qualitative factors such as quality, reliability, flexibility, promptness etc.

Since traditional performance measurement, focuses on external accounting data, which are becoming obsolete, therefore something was needed to provide that extra information to the enterprises with efficient planning tools. Further it is often not clear to managers how the non-financial measures on which their performance is evaluated can contribute to the whole picture of achieving success in financial terms. The need to link financial and non-financial measures of performance and to identify key performance measures provided the impetus for **Kaplan & Norton** (1992) to devise Balanced Score Card.

Meaning of Balanced Score Card :

Balanced Score Card is a set of financial and non-financial measures relating to a company's critical success factors. It is an approach which provides information to management to assist in strategic policy formulation and achievement. It emphasises the need to provide the user with a set of information which addresses all relevant areas of performance in an objective and unbiased manner. As a management tool it helps companies to assess overall performance, improve operational processes and enable management to develop better plans for improvements. It offers managers a balanced view of their organization upon which they can base real change.

Major components of balanced score card :

The components of balanced score card varies from business to business. A well designed balanced score card combines financial measures of past performance with measures of firm's drivers of future performance. The specific objectives and measures of an organisation's balanced score card are derived from the firm's vision and strategy. Generally, balanced score card has following four perspectives from which a company's activity can be evaluated. These are :

- (1) Customer perspective i.e. how do customers see us.
- (2) Internal perspective i.e. what must we excel at.
- (3) Learning & Growth perspective i.e. can we continue to improve and create value.
- (4) Financial perspective i.e. how do we look to our shareholders.

1. Financial Perspective : "How Do We Look To Shareholders?"

In this step manager of a division or a unit, links its business objectives to the corporate strategy of the company as a whole. Financial performance measures indicate whether the company's strategy implementation and execution are contributing to its revenue and earnings. To identify key performance measures in this perspective, managers, during strategic planning ask "How do we look to shareholders?"

Corporate strategy and strategic initiatives are examined from the financial perspective to see feasibility of these initiatives of being met. The financial objectives chosen for the balanced scorecard implementation should serve two purposes:

- To provide definite performance that was expected at the time of strategies selection.
- To provide a focus for objectives and appropriate measures in each of the other three perspectives.

2. Customer Perspective: "How Do Customer View Us?"

In this stage, companies identify customers and market segments in which they compete and also the means by which they provide value to these customers and markets. Managers identify the lead indicators which make a particular business unit or product different from that of others. Lead indicator may vary from customer to customer or market segment. If for example, a customer values on-time delivery then on-time delivery becomes a lead indicator. Examples of lead indicators may include any number of customer considerations, including:

- On-time delivery
- On-site service
- After sales support
- Defects per order
- Cost of the product
- Free shipments etc.

By delivering quality as per the customer demand and need, business units can improve outcome measures such as customer satisfaction, retention, acquisition and loyalty.

3. Internal Business Perspective: "At What Must We Excel?"

In this stage companies identify processes and activities which are necessary to achieve the objectives as identified at financial perspectives and customer perspective stage. These objectives may be achieved by reassessing the value chain and making necessary changes to the existing operating activities. If maintaining net earnings is the financial objective of a company and after sales service can increase customer retention, then internal business perspective needs to improve after sales services to satisfy customer requirements to maintain net earnings. This objective may be achieved by providing for example toll free customer help lines, setting up service centres in all major cities etc.

4. Learning and Growth Perspective: "How Do We Continue To Improve And Create Value?"

In the learning and growth perspective, companies determine the activities and infrastructure that the company must build to create long term growth, which are necessary to achieve the objectives set in the previous three perspectives. Organisational learning and growth comes from three principle sources:

- People i.e. employee capabilities
- Systems i.e. information system capabilities and
- Organisational procedures i.e. motivation, empowerment and alignment.

Since, the balanced scorecard is intended to improve long-term performance, managers may invest in resources needed in the short-run, but this should not affect business unit's performance.

The ultimate result of using the Balanced Scorecard approach should be an improved long term financial performance. Since the scorecard gives equal importance to the relevant non-financial measures, it should discourage the short term savings that leads to cuts in spending on new product development, human resource development etc. which are ultimately detrimental for the future prospects of the company.

The responsibility to devise and implement a Balanced Scorecard should be that of the managers working with the business. Since every company is different, it shall need to work out for itself the various financial and non – financial measures, which need to be focused upon for its own development. Since the Balanced Scorecard is recommended as a management tool used both for internal and external reporting purposes, it is again the manager's responsibility to decide as to what information needs to be disclosed and how any problems of confidentiality can best be overcome.

Process of creating a Balanced Score Card :

The steps given below shows a process to create a balanced score card. It also depicts various steps involved to create a balanced score card. These steps are :

1. To identify a vision i.e. where an organisation should go.
2. To identify organisation's strategies i.e. how an organisation is planning to go there.
3. Define critical success factors and perspectives i.e. what we have to achieve in each perspective.
4. Identify measures which will ensure that everything is going in the expected way.
5. Evaluation of Balanced Score Card i.e. ensuring what we are measuring is right.
6. Create action plans for implementation of Balanced Score Card.
7. Follow up and manage i.e. post implementation follow up actions and management.

Example :

Consider the company in computer hardware business intend to create balanced score card. The various steps involved will be as follows:

1. To identify vision: The vision of company is "to dominate the market".
2. To identify the strategy: The strategy is to focus on cost efficiency, high quality and fresh investment in new technology.
3. To identify the critical success factors and perspectives: A set of goals is known as critical success factors or key performance indicators (KPI) for each perspective may be as follows:

1. Customer Perspective:

Goals	Performance Measures (KPI)
Price	Competitive price
Delivery	Number of on time delivery, lead time from receipt of order to delivery to customers.
Quality	Own quality relative to industry standards, number of defects or defect level.
Support	Response time, customer satisfaction surveys.

2. Internal business Perspective:

Goals	Performance Measures (KPI)
Efficiency of manufacturing process	Manufacturing cycle time
Sales penetration	Annual sales v/s Plan sales, increase in number of customers in a unit of time.
New product introduction	Rate of new product introduction per quarter.

3. Learning & Growth Perspective:

Goals	Performance Measures (KPI)
Technology leadership	Product performance compared to competitors, number of new products with patented technology.
Cost leadership	Manufacturing overhead per quarter as a percentage of sales, rate of decrease in cost of quality per quarter.
Market leadership	Market share in all major markets.
Research & development	Number of new products, numbers of patents.

4. Financial Perspective :

Goals	Performance Measures
Sales	Revenue and profit growth
Cost of sales	Extent it remain fixed or decreased each year
Profitability	Return on capital employed
Prosperity	Cash flow & Wealth creation

Once the goals and measures for each perspective are established the next step is to create action plans for achieving defined targets.

Shortcomings of Balance Score Card

The following are some reasons why Balanced Scorecards sometimes fail to provide the desired results :

- Managers mistakenly think that since they are using Balanced Scorecard, they have already covered all non – financial measures.
- Senior executives misguidedly delegate the responsibility of the Scorecard implementation to middle level managers.
- Company's try to copy measures and strategies used by the best companies rather than developing their own measures suited for the environment under which they function.
- There are times when Balanced Scorecards are thought to be meant for reporting purposes only. This notion does not allow a Business to use the Scorecard to manage Business in a new and more effective way.

Question 14 : [ICAI Module]

Standard Telecom Ltd. is a leading cellular service provider having a global presence. It aims to be the most innovative and trusted telecom company in the world. To achieve this aim, it is constantly working on its overall functioning. It is trying to adopt best managements practices in the world. Following are some information related to the company's performance for a particular period:

Particulars	Current Year	Base Year	Target
Operating Cost Ratio	60%	54%	Reduce it to 50%
Average Revenue per user	₹ 225	₹ 210	Increase it to ₹250
Unresolved Consumer Complaints	27,500	25,000	Reduce it by 20%
Customer Relationship Centres	280	200	Take the total to 250
Employee coverage under Training Programme	10%	8%	At least 15%

Required :

ANALYSE the performance of the company using Balance Scorecard approach.

Solution 14 :

The balanced scorecard is a method which displays organisation's performance into four dimensions namely financial, customer, internal and innovation. The four dimensions acknowledge the interest of shareholders, customers and employees taking into account of both long-term and short-term goals. The detailed analysis of performance of the company using Balance Scorecard approach as follows:

- (i) **Financial Perspective:** Operating cost ratio and average revenue will be covered in this prospective. Company is unable to achieve its target of reducing operating ratio to 50% instead it has increased to 60%. Company is required to take appropriate steps to control and manage its operating expenses. Average revenue per user has increased from ₹210 to ₹225 but remains short of targeted ₹250. This is also one of the reasons of swelled operating ratio. Company can boost up its average revenue per user either by increasing the price of its services or by providing more paid value added services.
- (ii) **Customer Perspective:** Service complaints will be covered under this perspective. The company had set a target of reducing unresolved complaints by 20% instead unresolved complaints have risen by 10%. It shows dissatisfaction is increasing among the consumers which would adversely impact the consumer's general perception about the company and company may lose its consumers in long run.
- (iii) **Internal Business Perspective:** Establishing customer relationship centres will be covered under this perspective. Company has established 80 relationship centres in the current period exceeding its target of 50 to cater to the needs of existing consumers as well as soliciting new consumers. This shows the seriousness of the company towards the consumer satisfaction and would help them in the long run.
- (iv) **Learning and Growth Perspective:** Employee training programmes are covered under this perspective. Company had set a target to cover at least 15% employee under its training programmes but covered only 10%. This could hurt capabilities of the employees which are needed for long term growth of the organisation necessary to achieve the objectives set in the previous three perspectives. People or the human resource of the company is one of the three principle sources where organisational learning and growth comes.

Question 15 :

Classify the following measures under appropriate categories in a balanced score card for a banking company which excels in its home loan products:

- (i) A new product related to life insurance is being considered for a tie up with the successful housing loan disbursements. e.g. every housing loan applicant to be advised to take a life policy or compelled to take a fire insurance policy.
- (ii) How different sectors of housing loans with different interest rates have been sanctioned, their volumes of growth in the past 4 quarters.
- (iii) How many days are taken to service a loan, how many loans have taken longer, what additional loans are to be released soon etc.

Question 16 :

In the context of a Balanced Score Card, identify the perspective of the following independent situations:

S.N.	Organization	Target Parameter	Perspective
(i)	Courier Company	100% on-time delivery of priority	
(ii)	Tuition Centre	Set up class-on-Internet facility for better reach of more number of students and absentees.	
(iii)	Computer Manufacturing Company	Set up Service Centers in all major cities for after sales support.	
(iv)	Government Taxation Department	Ensure Computer Training to all officers above a certain rank to improve their capabilities.	

Question 17 :

ABC Ltd. has supermarkets located in most towns and cities. Over the last few years, profits have fallen. ABC Ltd. has recognised that customer care has been paid insufficient attention. ABC Ltd. has now realized the importance of the customer experience at its supermarkets. ABC Ltd. has introduced a loyalty card scheme that rewards customer with discount vouchers based on their spend and buying patterns at supermarkets in an attempt to earn the loyalty of its customers. The management of ABC Ltd. is considering the introduction of a Balanced Score Card approach to manage the performance of its stores.

Required :

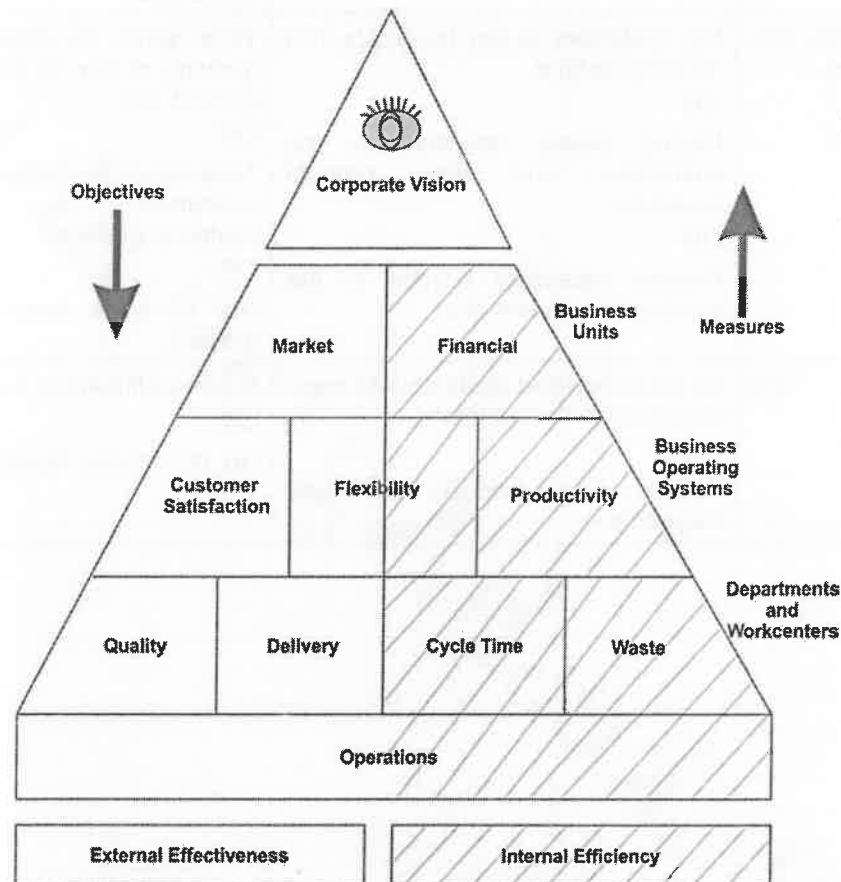
Recommend an Objective and a suitable Performance Measure for each of the 3 Non-Financial Perspectives of a Balanced Score Card that ABC Ltd. could use to support its new strategy of improving the customer experience. You should state 3 Perspectives, an Objective and a Performance Measure for each of the 3 Perspectives.

Solution 17 :

Non-Financial Perspective	Objective	Performance measure
Customer Perspective	Increase the customer loyalty. OR Retaining the existing customers.	Percentage of customers using loyalty cards OR No. of discount vouchers redeemed.
Internal Business Perspectives	For customers to pay for goods in a reasonable time OR Paying proper attention to the customers and their product enquiries. OR Provide necessary support to the existing loyal customers.	Time spent by customers in queuing to pay for products at a check out. OR Time spent by customers care executives in handling customers queries. OR No. of times home delivery made.
Learning and growth perspectives	To have qualified staffs able to meet the needs of the customer. OR Adding new products for new segments	No. of staff training days. OR No. of schemes launched.

Performance Pyramid

The Performance Pyramid also known as Strategic Measurement and Reporting Technique by Cross and Lynch 1991. They viewed businesses as performance pyramids. The attractiveness of this framework is that it links the business strategy with day-to-day operations. The analogy of building a house can be applied here. To build a strong house one must start with a proper foundation in order to build a house which structurally sound and one that will last.



In the above pictorial presentation:

- 'Objectives' are shown from top to bottom.
- 'Measures' are from bottom to the top.
- At the top is the organization's corporate vision through which long term success and competitive advantages are described.
- The 'business level' focuses on achievements of organization's CSF in terms of market and financial measures.
- The marketing and financial success of a proposal is the initial focus for the achievement of corporate vision.
- The above factors are linked to achieving customers satisfaction, increase in flexibility and high productivity.
- The above driving forces can be monitored using the operating forces of the organization.

- The left-hand side of the pyramid contains external forces which are 'non-financial'.
- On the other hand, the right-hand side of the pyramid contains internal efficiency which are predominantly 'financial' in nature.

Question 18 :

You are a paid assistant working in SBC LLP – an accounts consultancy firm. You have received the following email from one of SBC's senior partner:

To: DG

From: SB

Date: 22/06/2014

Subject: PEL meeting this afternoon

As you are probably aware, we are meeting with the managers of PEL later this afternoon to discuss several key issues, and I need you to do some research for me. I need a report that covers the following:

Analysis of the new proposal for the period 2015 to 2017 based on

- external effectiveness and
- internal efficiency

To help you with this, I've attached a copy of our forecast of PEL's financial and non-financial data for the period 2015 to 2017. Please read it carefully and email me back as soon as possible so I have time to prepare before the meeting.

Thanks

SB

Attachment

Background to PEL

Precision Engineering Ltd. (PEL) specialises in engineering design and manufacture in the automotive and motorsport industry. PEL's design team has many years' experience in the design and development of engine components for the market and high performance engines. PEL has identified a number of key competitors and intends to emphasis on close co-operation with its customers in providing products to meet their specific engineering design and quality requirements. Efforts will be made to improve the effectiveness of all aspects of the cycle, from product design to after-sales service to customers. This will require data from a number of departments in the achievement of the specific goals of the new proposal. Efforts will be made to improve productivity in conjunction with increased flexibility of methods.

Forecast of PEL's Financial and Non-Financial Data

Particulars	2015	2016	2017
Total Market Size (₹ lacs)	110	115	120
PEL Sales (₹ lacs)	18	21	23
PEL Total Costs (₹ lacs)	14.10	12.72	12.55
Production Achieving Design Quality Standards	95.5%	98.0%	98.5%
Returns from Customers (% of Deliveries)	2.0%	1.0%	0.5%

Cost of After-Sales Service (₹ lacs)	1.3	1.1	1.0
Sales Meeting Planned Delivery Dates	85%	90%	95%
Average Cycle Time (Customer enquiry to delivery) (weeks)	5.0	4.5	4.0
Components Scrapped in Production (%)	6.5%	4.0%	1.5%
Idle Machine Capacity (%)	9%	5%	1%

Required :

Draft the email as requested by the partner.

Solution 18 :

To: SB

From: DG

Date: 22/06/2014

Subject: Re: PEL Meeting this afternoon

Please find below my analysis of the points you wished me to examine for PEL. Please let me know if you wish to discuss any of these points in more detail.

Kind regards

DG

External Effectiveness –

The marketing success of the proposal is associated with the achievement of customer satisfaction. The success will need an efficient business operating system for all aspects of the cycle from product design to after-sales service to customers. Customer satisfaction is linked with improved quality and delivery.

Quantitative measures of these factors are as follows:

- Quality is expected to improve. The percentage of production achieving design quality standards is expected to increase from 95.5% to 98.5% between 2015 and 2017.
- In the same period, returns from customers for replacement or rectification should drop from 2% to 0.5% and the cost of after-sales service should drop from ₹1.3 lacs to ₹1.0 lac.
- Delivery efficiency improvement that is expected may be measured in terms of the rise in the percentage of goods achieving the planned delivery date. This percentage rises from 85% in 2015 to 95% in 2017.

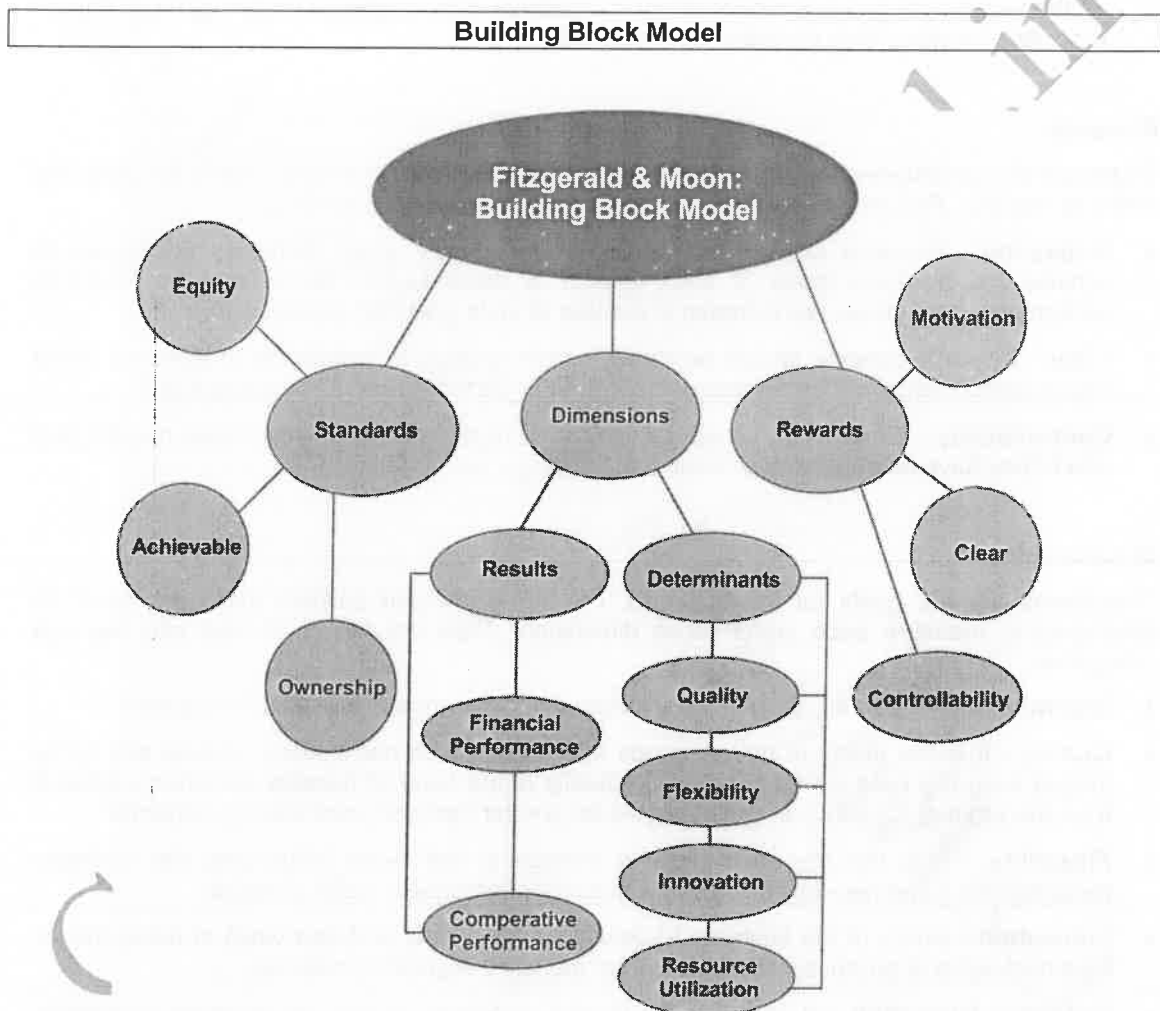
Internal Efficiency –

The financial success of the proposal is linked to the achievement of high productivity. This should be helped through reduced cycle time and decreased levels of waste, increase in sales revenue and decrease in cost etc.

Quantitative measures of these factors are as follows:

- The average total cycle time from customer enquiry to delivery should drop from 5 weeks in 2015 to 4 weeks in 2017.

- Waste in the form of idle machine capacity is expected to drop from 9% to 1% between 2015 and 2017.
- Component production scrap is expected to drop from 6.5% in 2015 to 1.5% in 2017.
- PEL's market share is expected to increase from 16.36% in 2015 to 18.26% in 2016 to 19.17% in 2017. [i.e. PEL Sales / Total Market Size]
- PEL's Profit is expected to increase from 3.90 lakhs in 2015 to 8.28 lakhs in 2016 to 10.45 lakhs in 2017. [i.e. PEL Sales – PEL's Total Costs]



Fitzgerald and Moon proposed a Building Block Model which suggests the solution of performance measurement problems in service industries. But it can be applied to other manufacturing and retail businesses to evaluate business performance. Variants of the building block model are currently used in Australia in the regulation of electricity transmission and distribution, gas transmission and distribution, railways, postal services, urban water and sewerage services, irrigation infrastructure, and port access.

Standards :

These are the measures used, i.e. the KPIs, should have the following characteristics:

- **Equity** - Performance measures should be equally challenging for all parts of business. Relaxation given to one part of the business leads to perception of unfair treatment to others and hence it affects productivity. The meaning of equity is to be taken as equality.
- **Ownership** - Performance measure should be acceptable to everyone. Employees should get involved in the identification of performance measures rather than being imposed on them. Ownership here means the responsibility for the results. The employees should own the responsibility for their performance.
- **Achievable** - Performance measure should be realistic and achievable. For example, if we set the targets using actual results of our competitors. The employees may not be motivated to achieve targets if they consider it as impossible.

Rewards :

To ensure that employees are motivated to meet standards, the standards need to be clear and linked to rewards. Reward schemes should possess following characteristics:

- **Motivation** - Rewards scheme should be set in manner which motivates employees to achieve the business goals. If sales growth is desired, then bonus can be linked to performance measures, like increase in number of units sold than previous year.
- **Clear** - Rewards scheme should be clearly communicated to employees in advance. What kind to performance will be rewarded and how their performance will be measured?
- **Controllability** - Employees should be rewarded or penalized for only those results over which they have some control or influence.

Dimensions :

Dimensions are the goals for the business, i.e. the CSFs and suitable measures must be developed to measure each performance dimension. They are further divided into two sub categories.

1. Determinants : These are performance areas which influence the results. These are -

- **Quality** - It is the ability to deliver goods and service with consistency. Quality should be judged from the eyes of the customers. Quality is the level of benefits customers expects from the product. Quality (i.e. value) should be greater than the price paid by customer.
- **Flexibility** - It is the responsiveness to change in the factor influencing the business performance. Example - ability to cope with sudden increase in sales demand.
- **Innovation** - Ability of the business to devise new products and new ways of doing things. Like packaging of products with environment friendly (recyclable) material.
- **Resource Utilization** - It is the ability to use resources to achieve business objectives. Business assets should be used for the proper purpose and in most efficient way. Example - using delivery vans to its maximum capacity only for carrying authorized goods and not for personal purposes.

2. Results : It reflects the success or failure of determinants identified above.

- **Financial Performance** - Financial performance gives an indication of overall business at a glance in monetary terms. These can be used to identify areas of strengths and weaknesses. It may also highlight other areas which may be critical to business success.

- Comparative Performance - How we stand in comparison with our competitors? How are we different from our competitors? Example - offering products of higher quality than competitors and products having distinct features than rival products.

The Results and Determinants Framework

	Dimensions of Performance	Types of Measures
R E S U L T S	Competitiveness	<ul style="list-style-type: none"> • Relative Market Share and Position • Sales Growth • Measures of the Customer Base
	Financial Performance	<ul style="list-style-type: none"> • Profitability • Liquidity • Capital Structure • Market Ratios
D E T E R M I N A N T S	Quality of Service	<ul style="list-style-type: none"> • Reliability • Responsiveness • Aesthetics/appearance Communication • Cleanliness/tidiness • Comfort • Friendliness • Courtesy • Competence • Access • Availability • Security • Communication
	Flexibility	<ul style="list-style-type: none"> • Volume Flexibility • Delivery Speed Flexibility • Specification Flexibility
	Resource utilization	<ul style="list-style-type: none"> • Productivity • Efficiency
	Innovation	<ul style="list-style-type: none"> • Performance of the Innovation Process • Performance of Individual Innovations

Question 19 : [ICAI Website - Case Study]

Grab and Go is a fast food joint operating in a very competitive business environment. It is a profitable business with very good prospects for growth. A strategy development meeting is underway to chalk out a plan to improve business growth in a very systematic measurable manner.

The following information is given to you:

Grab and Go has the following mission statement *"Derive strength to grow in scale using our passion for the craft of cooking and service that will satisfy our customers, employees and other stakeholders."* Grab and Go is a closely held partnership firm with five partners. It started at a scale of operations that catered to the local demand within a locality. Reputation for good quality food and service has helped it scale up its operations in the recent years. Most of the key decisions relating to operations like decision about the menu and its method of preparation, product pricing, finance, marketing, administration etc. are centralized. Skilled chefs, managers for various functions and the firm's partners are part of this core team.

A general survey published in a food trade magazine highlighted people's perception about fast food diet. Predominant opinion was that the current food platter available in food joints across the town were not healthy option. People want healthier choices in the menu when they dine out. At the same time, they do not want to compromise on taste or presentation of the food item. The other focal point for improvement was the order taking system. In most food joints, the current system is manual where the order taking staff note down a customer's order on paper, send it to the kitchen and then delivers the order on intimation from the kitchen, which is also done manually by the kitchen staff. This system has problems like errors in taking down orders, most times delivery staff are unaware of the content in an item or its availability, delays in delivery leading to customers complaining about food served cold etc. This problem takes away the pleasure of dining out and is leaving customers dissatisfied. Another scope for improvement is that customers want more payment options other than cash to settle their bills. With the advent of plastic money and mobile e wallet payments, carrying cash around has become cumbersome for most of them.

The partners have decided to use this as an opportunity to develop Grab and Go as the niche food joint addressing the customer's concerns, while managing to remain profitable. Consequently, Grab and Go plans to expand by providing more choices along with its regular menu to health-conscious customers. Also, revamping its ordering, delivery and payment system would improve customer experience. A reasonable return at the overall firm level would be a return on equity (Net Income / Total Partnership Capital) of 25% each year. Capital structure will remain unchanged. The partners are not interested in diluting their share by bringing in new partners or take external funding with ownership stake. They may however utilize bank financing for expansion, but only if required.

Expansion of business will entail opening new branches in other localities as well as forging franchise with other stakeholders. However, Grab and Go is not clear how to measure market share since the fast food industry market is not entirely an organized sector. There is no clear information about the overall revenue of the whole sector.

In the past, it was quality of its products that drove growth. The management wishes to maintain high quality standards across branches and franchisee. Therefore, an internal quality control department may be established to look into the same. External certifications from government food inspectors and other recognized agencies would also be required to be met. Quality refers to both product quality and service quality, in this case, service being an inherent part of customer experience.

The staff at Grab and Go are also excited at this opportunity. Expansion of the food joint would present a more dynamic work culture. Chefs would have the opportunity to enhance their skill by trying out various ways to cater to the consumer's palate. Ordering and delivery staff would have the opportunity to enhance their people management skills. This learning opportunity would definitely be an impetus for their career growth. With expansion, chances of promotion within the

organization increases. Financially, better business leads to the expectation of better pay and reward system.

Consequently, the management is intent on developing a performance management system that tracks performance across the organization. Among the different models, the Building Block Model is being considered.

Required :

ADVISE the partners how the Building Block Model at Grab and Go could be implemented.

Solution 19 :

Performance management using the Building Block Model poses three questions based on which the performance measurement system is developed:

What dimensions of performance should the company measure?

Dimensions are the goals that the company wants to achieve based on its overall strategy, those goals that define its success.

How to set the standards (benchmarks) for those measures?

What are the rewards needed to motivate employees to achieve these standards?

Dimensions

Dimensions (goals) include financial and non-financial goals. Dimensions are further categorized as into results and determinants. Results are tracked as (a) financial performance and (b) competitive performance. Determinants are tracked as (a) quality, (b) flexibility, (c) innovation, and (d) resource utilization. Determinants influence results.

Results

- (a) **Financial Performance:** Grab and Go is a closely held partnership with 5 partners. Partners are interested in earning profits that have been benchmarked at an overall return on equity of 25% each year. This can be derived from periodic financial statements that get prepared as part of the accounting function. Partners want to retain the current capital structure. This implies that they do not have any plans to go public or have other external funding with ownership stake. They may take loans from banks for funding their expansion.

Consequently, if they want to expand, the firm has to make sufficient profits that will yield ample cash reserves. Therefore, Grab and Go's financial performance dimensions should also include profitability ratios like gross profit ratio, net profit ratio, operating margin, return of capital employed (if bank loans are taken) etc. Cash profit and changes in cash reserves may also be included as dimensions of performance. These measures should be tracked at the firm's overall level as well as at the individual branch/franchisee level.

- (b) **Competitive Performance:** Grab and Go was to be a niche joint in a highly competitive segment. However, to measure how it compares with its peers there is a limitation in terms of availability of information due to the unorganized nature of the fast food industry. All the same, one of the measures that can be helpful are the number of branches / franchisees the firm is able to open.

Grab and Go is also likely to have a competitive edge because it is foraying into providing healthier food choices along with its regular menu. Since this is unique among its segment, it will retain a competitive edge until its peers start replicating the same. Therefore, one other measure for competitive performance could be the spread and uniqueness of Grab and Go's menu as compared to its peers. Information for this could be gathered from published / researched sources like trade magazines as well as informal sources like customer feedback / word of mouth.

Determinants

- (a) **Quality:** Quality drove past performance and it will continue to drive performance even after expansion. For product quality, the management should track if internal quality checks and external certifications are met periodically. Quality control should cover all branches and franchisees. Non-compliance may require immediate attention of the management. For service quality, periodic training programs can be initiated to educate the staff with people management skills. Therefore, Grab and Go should determine parameters that the management would be interested in ensuring that quality standards are met and how noncompliance should be reviewed.
- (b) **Innovation:** Innovation involves experimenting with the appropriate inputs which make them healthy. At the same time, the healthier option should satisfy the taste and presentation preference of customers. This requires innovative efforts from qualified and skilled chefs. This will give the competitive edge to Grab and Go. Innovation has to be constant and not a onetime exercise. Therefore, management may review the number of new variants that have been introduced in the menu, regularity of these introductions and customer feedback of the same.
- (c) **Flexibility:** Growth in scale of operations combined with a competitive business environment implies that Grab and Go should have some flexibility in its operations. This could mean ability to hire staff quickly, cater to seasonal surges in customer's demand etc.
- (d) **Resource utilization:** Better utilization of resources help business function efficiently. Revamping the order, delivery and payment system would improve the way resources (kitchen, ordering and delivery staff) operate. Lesser errors and delays would increase capacity utilization, freeing up time to cater to more customers. Consequently, pressure on resources decreases. Therefore, some indicators to be tracked can be overtime / idle time of kitchen, ordering and delivery staff, turnaround time in these functions, table occupancy rate, breakage or wastage of material etc. Again here, the management should chart out the appropriate dimensions that will help them track resource utilization.

Standards

Standards are the benchmarks or targets related to the performance metric that is being tracked under each dimension. To be useful, standards should have the following characteristics:

- (a) **Ownership:** It is important to establish who in the organization structure is responsible for achievement of which performance metric. Grab and Go has to consider this very carefully. As explained in the problem, many key management functions like decisions about the menu and its preparation are determined by a core team. Similarly, the centralized core team is handling finance and marketing. However, at the branch level, managers of various operational functions can be held accountable for performance of that specific process. For example, the chef at a particular branch can be held accountable for the quality of food prepared in that branch (Dimension: Quality). Similarly, the head of the order taking staff at a particular branch can be held accountable for the overtime that the staff is putting in at that branch (Dimension: Resource utilization).
- (b) **Achievability:** Benchmarks and targets will be useful only if they are achievable. The managers who have ownership for the achievement of performance metric have to be involved in setting benchmarks or targets. They should be clearly defined, preferably quantifiable. At the same time, they should be in line with the firm's overall strategy. If the target is set very high, staff can get de-motivated. If set too low, will not raise the bar for performance. If not in line with the firm's overall strategy, there will be discord or gap between the firm's performance and what it wants to achieve.

- (c) **Equity:** Benchmarks should be equally challenging for all parts of the business. Grab and Go should customize its performance measure for each function like kitchen staff, order and delivery staff, finance staff, advertising staff etc. For example, while turnaround time to meet a customer's order would be relevant metric to the kitchen, ordering and delivery staff, popularity of the advertisement jingle for Grab and Go would be the relevant metric for the advertisement department. The rigor of the target should be uniform across departments. Otherwise the staff would view the benchmark system as being biased towards select functions within the firm.

Rewards

This relates to the reward structure within the firm that includes compensation package, bonus, rewards, awards, facilities provided to employees etc. Proper reward system is required for achievement of standards while maintaining costs at optimum levels. Grab and Go should have a well-defined HR policy for compensation, bonus, promotion and reward. A good system should have the following characteristics:

- (a) **Motivation:** Does the reward system drive the people to achieve targets and standards? A low reward system would not induce staff to work towards the goal. Goal clarity and participation in target/benchmark setting can motivate staff to achieve standards.

While some part of compensation may be fixed, other parts can be made variable. For example, bonus of the advertising staff can be aligned to the sales generated, Chefs can be rewarded bonus based on sales as well as quality measures etc. Better job prospects in a growing environment would also be a good motivator. Grab and Go's management should track various metric in this regard. Some of them could be percentage of bonus paid to the overall compensation package, categorized staff cadre, attrition rate, internal promotions, cross training programs etc.

- (b) **Clarity:** The reward package should be clearly communicated to the staff. It should be understood by the staff concerned. They should be told what kind of performance will be rewarded and how their performance will be measured. Grab and Go may consider having a dedicated HR team for this purpose.

- (c) **Controllability:** Unlike the traditional understanding, rewards need not be based only on the financial element that the staff can control. There may be other non-financial elements for which rewards can be given. Both aspects however need to be controllable by the staff concerned. For example, the chef can come up with a popular menu. If the pricing of the product, managed by the central core team, is such that it results in a loss to Grab and Go, the chef may not get the much-deserved bonus. This is not a good reward system and might lead to attrition.

Grab and Go can design its performance measurement system along the above lines.

Performance Prism (PP)

Performance Prism creators Andy Neely and Chris Adams mentioned that the better-known Balanced Scorecard framework only focuses on two sets of stakeholders : shareholders and customers. The Performance Prism is an approach to performance management which aims to effectively meet the needs and requirements of **all stakeholders**. This is in contrast with the performance pyramid which tends to concentrate on customers and shareholders and is also in contrast with value based management, which prioritizes the needs of shareholders.

Who are the stakeholders :

All those who are associated with our organisation and will get affected by our decisions are known as stakeholders. For example – Customers, Suppliers, Service providers, Employees, Lenders of money, Shareholders, Government, Society in general.

- It takes stakeholder requirements as the start point for the development of performance measures rather than the strategy of the organisation.
- It recognises the need to work with stakeholders to ensure that their needs are met.

There are five 'interrelated facets' to the Performance Prism which lead to key questions for strategy formulation and measurement design. These are -

- 1. Stakeholders Satisfaction:** The organization needs to focus on who are the stakeholders? What are the needs and wants of the stakeholders.
- 2. Strategies:** What are the strategies required by the organization to fulfill the wants and needs of the stakeholders?
- 3. Processes:** What are the necessary processes required for satisfying the above strategies?
- 4. Capabilities:** What capabilities does the organization needs for operating and enhancing the process?
- 5. Stakeholders Contributions:** It further takes into account what contribution does the management needs from its stakeholders?

The Performance Prism allows organisations to develop strategies, business processes and measures geared to the specific needs of all important stakeholder groups. By taking a broad stakeholder perspective that includes regulators and business communities, the PP enables an organisation to more directly address the risks and opportunities in its business environment. Using the PP to develop measures for each relevant stakeholder facilitates the communication and implementation of strategy.

Performance Measures – General Benefits

Berry, Broadbent and Otley (1995) suggest that the following benefits can be derived from the use of performance measures:

- Develops agreed measures of activity.
- Clarifies the objectives of the organization.
- Greater understanding of process.
- Helps facilitate comparison between divisions.
- Promotes accountability to stakeholder.
- Helps in setting of targets for managers.
- Helps facilitate comparison between different organizations

Performance Measures – General Problems

Problems that may develop from the use of performance measures by an organization are as follows:

- Tunnel Vision – Undue focus on measurements to the detriment of other areas.
- Sub-optimisation – Not making the best use of available resources.
- Myopia – Focusing too much on short term measures and not looking long term.
- Misrepresentation – Not presenting the data correctly.
- Misinterpreting – Misinterpreting the data.
- Ossification – Keeping the out of date measures.
- Irrelevance – Using irrelevant measure to show good performance.
- Gaming – Deliberate attempt to distort the measures to show good performance.

Question 20 : Case Study

Galaxy Limited is in the business of logistics and distribution. In 2002, Galaxy limited had implemented Balance Scorecard as a performance measurement & management system. The balanced scorecard measures performance across Financial, Customer, Business and Innovation perspective. The implementation of Balanced Scorecard had the following impact – The company's financial performance improved substantially. The complaints from customers regarding poor service reduced. The company has pioneered in innovation in the field of door to door delivery of goods.

All these led to improvement in profitability of the company. The share prices are trading at life time highs. Since the ultimate objective of a commercial organisation is to maximise shareholder's wealth, the CEO of the company is extremely pleased with the affairs at the company.

Of late, the company has witnessed high employee turnover ratio. Though the company has a formal exit interview process for the resigning employees, the inputs received from these interview is rarely considered in improving the HR practices. One of the common feedback from employees who left the company was that there is too much pressure to perform and improve customer service without adequate support systems and processes.

Also, the truck drivers who move consignment from one city to another have been on strike thrice in the last one year demanding better pay and working conditions. These drivers are generally hired on contractual basis. They are not entitled to any retirement benefits. The drivers have been insisting that they should be taken as permanent employees and are given benefits applicable to other employees of the company.

The above two issues were discussed in one of the board meetings. The directors wondered if they had the right performance measurement mechanism to address the issues. The company is doing great financially but must also ensure that the employees and other stakeholders are taken care of apart from shareholders. The board is also concerned that they have too much of data and reports to look at on performance management as the current measurement is done on a monthly basis. However, the alignment of such reports to the overall strategy of the company is missing.

Required :

Recommend an alternative performance measurement mechanism which considers all stakeholders instead of just shareholders and customers.

Solution 20 :

Issue

Galaxy limited use Balance Scorecard to measure performance. Balance scorecard focuses on the financial, customer, business and innovation perspectives. The company has been doing great on financial parameters and customer satisfaction parameters. However, of late the company has been facing issues related to high employee turnover and dissatisfaction of the truck drivers.

The board of directors is also concerned about the volume of performance measurement data and alignment of performance measurement with the strategy of the company. An alternate performance measurement mechanism is Performance Prism.

Performance Prism

Performance Prism is considered to be a second-generation performance management framework conceptualized by Andy Neely and Chris Adams. The following are the factors which make Performance prism should replace the models like Balanced Scorecard -

- Organisations cannot afford to focus on just two stakeholder group - Investors and Customers. Other stakeholders group like employees, suppliers, government etc. should not be forgotten. This is important for sustainable growth of companies both profit oriented and non-profit oriented.
- Most of the performance measurement models do not focus on changes that could be made to the strategies and processes. The underlying assumption is that if right things are measured, the rest will fall into place automatically.
- Stakeholders expect something from the organisation. The organisation also must expect contribution from the stakeholders. There is a 'Quid Pro Quo' relationship between the stakeholders and organisation. That is give and take relationship or something in return.

Another problem highlighted by Andy Neely and Chris Adams was that management are measuring too many things. They believe that in doing so they are controlling the organisations well. The problem with increased measurement is that the management starts micro-managing things and lose sight of the strategic direction. This negatively impacts the organisation in the longer run.

The performance Prism aims to measure performance of an organisation from five different facets listed below:

- Stakeholder Satisfaction
- Stakeholder's Contribution
- Strategies
- Processes
- Capabilities

Stakeholder Satisfaction

The first facet of prism focuses on stakeholder's satisfaction. Though balanced scorecard also focuses on stakeholder's satisfaction, it is primarily concerned with the shareholders and customers and ignores other stakeholders. This is precisely the issue at Galaxy limited where the shareholders and customers are happy with the company, other stakeholders are not.

The company must identify all stakeholders and determine relative importance of each of the stakeholders. A stakeholder group which has high power and high interest (say a trade union) must be kept satisfied. The key stakeholders for a company are:

- Investors - They want return on investment.
- Customers - They want good quality products at cheap prices.
- Suppliers - They want better price for products.
- Government - They want revenues and development.
- Society at large - They want employment opportunities.

Each of the stakeholders group exercise different level of power/influence on the company. The interest of each stakeholder group in the company also differs. Based on the power and interest of the stakeholders, the company must appropriately perform activities for stakeholder's satisfaction.

After identification of the stakeholders, the company must identify the requirements of each of the stakeholders group. What must the company do to ensure stakeholder satisfaction?

Galaxy limited must ensure satisfaction of the two stakeholders highlighted above. The company must take steps to improve employee satisfaction and reduce the employee turnover. The company must also address the issues related to truck drivers and involve them in a dialogue. The impact of not keeping these stakeholders group satisfied is that the company might suffer financially in the longer run.

Performance measures – After the suitable action, we can measure the performance based on Employee Turnover Ratio, Average employment duration of employees, Number of strikes by truck drivers etc.

Stakeholders Contribution

In the second facet of Performance Prism, the organisations identify the contribution required from the stakeholders. The organisations must then define ways to measure the contribution of stakeholders. This aspect is different from traditional measures where the organisations were just concerned with what they could contribute to the stakeholders.

The company would take steps to provide better service to its customers. In return the customers must contribute in terms of profits and revenues to the company. There is a 'Quid Pro Quo' relationship as described earlier.

In case of Galaxy limited, the company could improve the employee satisfaction with better pay, training and growth opportunities. In turn, the employees must perform better to contribute to the company as a whole. Similarly, the drivers must be given better working conditions and in turn, they should contribute towards improving efficiency and on-time deliveries.

Performance Measure - Efficiency of Employees, Productivity, On Time deliveries by Truck drivers etc.

Strategies

In the strategies facet of the Prism, the organisation should identify those strategies which the organisation would adopt to ensure that -

- The wants and needs of the stakeholders are satisfied
- The organisation's own requirements are satisfied by the stakeholders.

After the company identifies strategies, the performance measures must be put in place to confirm that the strategies are working. The various aspects to be considered appropriate are - communication of strategies, implementation of strategies by managers and continuous evaluation of appropriateness of strategies.

Galaxy limited might come out with a strategy to retain employees by means of better pay and growth opportunities within the company. This strategy can be called successful if the higher pay ensures that employee turnover ratio is reduced. As a strategy, the company can start to hire drivers on the payrolls of the company.

Performance Measure - Number of employees leaving the organisation after getting pay hike, Efficiency of deliveries after truck drivers are put on employment of company.

Processes

After identifying the strategies, organisations need to find out if they have the correct business processes to support the strategy. The various business processes can have sub-processes. Each process will have a process owner who is responsible for functioning of the process.

The organisations must develop measures to evaluate how well the processes are working. The management must be careful to evaluate most important processes instead of evaluating all the processes.

Galaxy limited could devise a recruitment process which results in transparency in hiring and pay of employees. The process could be owned by the Human Resources Manager. The working condition of drivers can be improved by providing structured training and better facilities to work.

Capabilities

Capabilities refer to the resources, practices, technology and infrastructure required for a particular process to work. The company must have right capabilities in order to support the processes. The company must identify performance measures to set how well the capabilities are being performed.

While Galaxy limited might choose to increase the salaries of employees, an important question to answer is whether the company has financial capability to do so.

Conclusion

The facets of Performance Prism are interlinked and must support each other. The company must first identify what the stakeholders want and what the company wants from those stakeholders. Then the required strategies for these are identified and the processes to achieve the strategy followed by identifying the capabilities to perform these processes.

Benchmarking

Introduction :

Benchmarking, a technique for continuous improvement was originated in Japan during the early 1960's due to Japanese curiosity and fondness for achieving the best of best. Various forms of benchmarking have been used in industry for years. After 1980s with the advent of worldwide competition in key industries benchmarking achieved lot of significance. Xerox, Motorola, Ford and other leading companies pioneered a much broader forms of benchmarking. These companies found benchmarking as valuable means of improving their competitiveness and effectiveness. It became an integral part of their continuous process improvement programme.

Meaning of Benchmarking :

Benchmarking is a technique for continuous improvement in performance. It involves comparing a firm's products, services or activities against other best performing organisations, either internal or external to the firm. The objective is to find out how the product, service or activity can be improved and ensure that the improvements are implemented. It attempts to identify an activity such as customer order processing needs to be improved and finding a non-rival organisation that is considered to represent world class best practice and studying how it performs the activity. It is a performance measure that provides the driving force to establish high performance and means to accomplish these goals. It is thus a component of a wider improvement process such as business process re-engineering or quality improvement.

Types of Benchmarking :

The benchmarking is a versatile tool that can be applied in a variety of ways to meet a range of requirements. The distinct types of benchmarks have been evolved over a period of time. Each has its own benefits and shortcomings and therefore each one is appropriate in certain circumstances than others. The Benchmarking is of following types :

(1) Competitive Benchmarking :

It involves the comparison of competitors products, processes and business results with own. Benchmarking partners are drawn from the same sector. However, to protect confidentiality it is common for the companies to undertake this type of benchmarking through trade associations or third parties.

(2) Strategic Benchmarking :

It involves a systematic process by which a company seeks to improve their overall performance by examining the long term strategies. It involves comparing high level aspects such as developing new products and services, core competencies etc.

(3) Global Benchmarking :

It is a benchmarking through which distinction in international culture, business processes and trade practices across companies are bridged and their ramification for business process improvement are understood and utilised. Globalisation and advances in information technology leads to use of this type of benchmarking.

(4) Process Benchmarking :

It involves the comparison of an organisation's critical business processes and operations against an organisation that performs similar work or deliver similar services in the best manner. For example, how do best practice organisations process customers orders.

(5) Functional Benchmarking :

This type is used when organisations look to benchmark with partners drawn from different business sectors or areas of activity to find ways of improving similar functions or work processes. This sort of benchmarking can lead to innovation and dramatic improvements.

(6) Internal Benchmarking :

It involves seeking partners from within the same organisation, for example, from business units located in different areas. The main advantage of internal benchmarking are that access to sensitive data and information are easier; standardised data is often readily available and usually less time and resources are needed. There may be fewer barriers to implementation, as practices may be relatively easy to transfer across the same organisation. However, real innovation may be lacking. The best in class performance is more likely to be found through external benchmarking.

(7) External Benchmarking :

It involves seeking help of outside organisations that are known to be the best in the class. External benchmarking provides opportunities of learning from those who are at the leading edge, although it must be remembered that not every best practice solution can be transferred to others. In addition, this type of benchmarking may take up more time and resources to ensure the comparability of data and information, the credibility of the findings and the development of sound recommendations.

(8) Intra-Group Benchmarking :

In intra group benchmarking the groups of companies in the same industry agree that similar units within the cooperating companies will pool data on their process. The processes are benchmarked against each other at or operational level. 'Improvement task forces' are established to identify and transfer best practice to all members of the group.

(9) Inter-Industry Benchmarking :

Inter-industry benchmarking a non-competing business with similar process is identified and asked to participate in a benchmarking exercise. For example, a publisher of school book may approach a publisher of university level books to establish a benchmarking relationship. Although two publishers are not in direct competition but there are obviously many similarities in their business with respect to sources of supply, distribution channels. Each will be able to benefit from the experience of other and establish 'best practices' in their common business processes.

(10) Product Benchmarking :

Product benchmarking is more or less reverse engineering. In this, organisation buys its rival's product and dismantle it to find out about components used in that product, features and performance; in comparison of its own product.

Goals of Benchmarking :

Benchmarking can deliver significant performance improvements and returns based on efficiency, cost savings and new revenues. Benchmarking projects typically target cycle times, productivity, customer service, quality and production. They also can be part of an effort to shift the culture of a company to be more customer oriented and result focused.

Process of Benchmarking :

The process of benchmarking requires a company to identify the areas i.e. processes, activities etc. which are central to its business and then selects the top-performing companies in those areas. By analysing how that excellence is achieved, the company learns lessons to apply to its own processes.

The benchmarking process is comprised of the following stages. These are :

1. Planning :

- (i) **Determination of benchmarking goal statement :** This requires identification of areas to be benchmarked. In practice, one should start with the identification of those areas which have to be really good to be really successful. One should start with the areas which account for most of the expenditure or which tie up most of the cash. One should remember that one cannot benchmark own performance until one has a reliable and efficient systems of measurement in its own organisation. This applies irrespective of whether our benchmarking partners are internal or external, in parallel or in totally different business sectors.
- (ii) **Identification of best performance :** Once the benchmarked goal statements are defined, the next step is seeking the best of the breed or best of the best. Since practically to arrive at the best is both expensive and time consuming therefore it is better to identify company which has recorded a phenomenal success in a similar area.
- (iii) **Establishment of the benchmarking or process improvement team :** Ideally this should include the persons who are most knowledgeable about the internal operations and will be directly affected by changes due to benchmarking.
- (iv) **Defining the relevant benchmarking measurement :** Relevant measures will not include the measures used by the organisations today but they will be refined measures that comprehend the true performance differences. Developing good measurement is key to successful benchmarking.

2. Collection of data and information : It involves the following steps :

- (i) Compile information and data on performance. They may include mapping processes.
- (ii) Select and contact partners.
- (iii) Develop with partners, a mutual understanding about the procedures to be followed and, if necessary, prepare a Benchmarking Protocol.
- (iv) Prepare questions and agree technology and performance measures to be used.
- (v) Distribute schedule of questions to each partner.
- (vi) Undertake information and data collection by chosen methods for example, interviews, site-visits, telephone, fax and e-mail.

3. Analysing the findings : The analysis of the findings of step (2) requires the following :

- (i) Review the findings and produce tables, charts and graphs to support the analysis.
- (ii) Identify gaps in performance between our organisation and better performers.
- (iii) Seek explanations for the gaps in performance. The performance gaps can be positive, negative or zero.
- (iv) Ensure that comparisons are meaningful and credible.
- (v) Communicate the findings to those who are affected.
- (vi) Identify realistic opportunities for improvement. The negative performance gap indicates an undesirable competitive position and provide a basis for performance improvement. If there is no gap it may indicate a neutral position relative to the performances being benchmarked. The zero position should be analysed for identifying means to transform its performance to a level of superiority or positive gap.

4. Recommendations : This involves -

- (i) Deciding the feasibility of making the improvements in the light of the conditions that apply within own organisation.
- (ii) Agreement on the improvements that are likely to be feasible.
- (iii) Producing a report on the benchmarking in which the recommendations are included.
- (v) Developing action plan(s) for implementation.
- (vi) Implement the action plans.
- (vii) Monitor performance.
- (viii) Reward and communicate successes.
- (ix) Keep key stakeholders informed of progress.

5. Monitoring and Reviewing : This involves -

- (i) Evaluating the benchmarking process undertaken and the results of the improvements against objectives and success criteria plus overall efficiency and effectiveness.
- (ii) Documenting the lessons learnt and make them available to others.
- (iii) Periodically re-considering the benchmarks for continuous improvement.

Pre-requisites for successful benchmarking :

Irrespective of the type and of scope of benchmarking, it will be important to ensure that -

- (i) Senior managers support benchmarking and are committed to continuous improvements;
- (ii) The objectives are clearly defined at the outset;
- (iii) The scope of the work is appropriate in the light of the objectives, resources, time available and the experience level of those involved;
- (iv) Sufficient resources are available to complete projects within the required time scale;
- (v) Benchmarking teams have a clear picture of their organisation's performance before approaching others for comparisons;
- (vi) Benchmarking teams have the right skills and competencies;
- (vii) Stakeholders, particularly staff and their representatives, are kept informed of the reasons for benchmarking.

Difficulties in implementation of Benchmarking :

- (1) Benchmarking is a time consuming and at times difficult. It needs significant time of the staff and company resources.
- (2) Benchmarking implementation requires the direct involvement of the senior manager etc. The drive to be best in the industry or world cannot be delegated.
- (3) It is likely to have resistance from employees.
- (4) Companies can become preoccupied with the measures. The goal becomes not to improve process but to match the best practices at any cost.
- (5) The key element in benchmarking is the adaptation of the best practice, to tailor it to the company's needs and culture. Without that step, a company merely adopts another company's process. This approach condemns benchmarking to fail.
- (6) Companies often waste time in benchmarking non-critical functions.

Benchmarking Code of Conduct :

Benchmarking is the process of identifying and learning from the best practices anywhere in the world. It is a powerful tool for continuous improvement. To contribute to efficient, effective, and ethical benchmarking, individuals agree for themselves and their organization to abide by the Benchmarking principles & code of conduct. It can be -

1. **Principle of Legality** : Avoid discussions or actions that might lead to or imply an interest in restraint of trade; market or customer allocation schemes, price fixing, dealing arrangement, bid rigging, bribery or misappropriation. Do not discuss costs with competitors if costs are an element of pricing.
2. **Principles of Exchange** : Be willing to provide the same level of information that you request, in any benchmarking exchange.
3. **Principles of Confidentiality** : Treat benchmarking interchange as something confidential to the individuals and organizations involved. Information obtained must not be communicated outside the partnering organization's without the partner's prior consent. An organisation's participation in a study should not be communicated externally without their permission.
4. **Principle of Use** : Use information obtained through benchmarking, only for the purpose of improvement of operations within the partnering companies themselves. External use or communication of a benchmarking partner's name with their data of observed practices requires permissions of that partner. Do not, as a consultant or client, extend one company's benchmarking study findings to another without the first company's permission.

Practical Insight :

Benchmarking at Xerox Corporation -

The benchmarking (competitive benchmarking followed by functional benchmarking) at Xerox drives numerous benefits. It has overhauled the processes at Xerox and helped them to emerge as a quality leader with customer satisfaction level of more than 90%; from a level where their products had over 30,000 defective parts per million (about 30 times more than its competitors). By 1983 Xerox had benchmarked more than 230 process performance areas in their operation.

Xerox won all the three prestigious quality awards i.e. The Deming Award (Japan) in 1980, the Malcolm Baldrige National Quality Award in 1989, and The European Quality Award in 1992.

Xerox business services, the company's document outsourcing division also won the Baldrige award in the service category in 1997.

Xerox witnessed both the **qualitative** and **quantitative** benefits, which includes –

- Highly satisfied customers for its copier and printing systems increased by 38% and 39% respectively.
- Customer complaints to the president's office declined by more than 60%.
- Customer satisfaction with Xerox's sales processes improved by 40%, service processes by 18%, and administrative processes by 21%.
- Overall customer satisfaction was rated at more than 90% in 1991.
- Service response time reduced by 27%.
- Inspection of incoming components reduced to below 5%.
- Defects in incoming parts reduced to 150 ppm from 30,000 ppm.
- Inventory costs reduced by two-thirds.
- Marketing productivity increased by one-third. Distribution productivity increased by 10%.
- Increased product reliability on account of a 40% reduction in unscheduled maintenance.
- Errors in billing reduced from 8.3 % to 3.5% percent.
- Country units improved sales from 152% to 328%.

Question 21 : [RTP - May 2019]

PHL, South Asia's premier express air and integrated transportation & distribution firm, offers a wide range of innovative supply chain services including Express Distribution, 3PL and Consulting. PHL offers innovative logistics solutions to its customers, enabling them to focus on their core competencies. The firm adds maximum value to businesses at every level, right from providing world-class warehousing support to ensuring time definite deliveries of goods in any country. The following information is available:

- (1) Each warehouse of PHL is solely responsible for all customers within a specified area. It collects couriers from customers residing within ambit of its own area for delivery both within the specific area covered by the warehouse and elsewhere in India.
- (2) After collections of couriers, a warehouse forward them for delivery outside its own area to the warehouses from which the deliveries are to be made to the customers.
- (3) Therefore, each warehouse must integrate its deliveries to customers to include:
 - (i) couriers that it has collected within its own area; and
 - (ii) couriers that are transferred to it from other warehouses for delivery to customers in its area.
- (4) Each warehouse's revenue is based on the invoice value of all couriers collected from customers in its area, irrespective of the location of the ultimate distribution warehouse.
- (5) Each warehouse costs consist its own operating costs plus some allocated proportion including centralised administration services (i.e. salary, legal & professional fees etc.) and distribution centre costs.
- (6) The management team and all employees of each warehouse are paid incentives which remains payable quarterly. The bonus is based on the achievement of a series of target values by each warehouse.
- (7) Internal benchmarking is used at PHL as to provide sets of absolute standards that all warehouses are expected to achieve.
- (8) The Annexure exhibit the target values and the actual values achieved for each of a sample group of four warehouses situated in City SG, City HK, City NY, and City NZ.

The target values consist of:

 - (i) Warehouse revenue and profitability;
 - (ii) Courier delivery services and customer care; and
 - (iii) Credit period control and administrative efficiency.

Incentives are based on a points system. It is also used as a stimulus for each warehouse improving the operational effectiveness. One point is awarded in case where the target value for each item in the Annexure is either achieved / exceeded, and a zero point where the target is not achieved.

Annexure**Revenue and Profitability**

Particulars	Revenue		Profit	
	Target	Actual	Target	Actual
	₹ million	₹ million	₹ million	₹ million
Company Overall	300	360	45	48
Warehouses :				
City SG	24.00	22.50	3.60	3.45
City HK	21.00	27.00	3.15	3.60
City NY	18.00	21.00	2.70	3.30
City NZ	27.00	33.00	4.05	4.20

In order to calculate points of each warehouse, actual profit as a % of actual revenue must exceed the target profit as a % of target revenue.

Courier Delivery Services and Customer Care

Particulars	Target %	Actual			
		SG %	HK %	NY %	NZ %
Measure (% of total):					
Late collection of couriers	3.00	2.85	3.15	2.70	3.60
Misdirected couriers	6.00	6.30	5.85	4.95	7.65
Delayed response to complaints	1.50	1.05	1.35	1.20	1.80
Delays due to vehicle breakdown	1.50	1.65	2.10	0.45	3.00
Measure (% of revenue):					
Lost items	1.50	0.90	1.35	1.20	2.85
Damaged items	3.00	2.25	3.60	2.25	2.70

Credit Control and Administration Efficiency

Particulars	Target %	Actual			
		SG %	HK %	NY %	NZ %
Average debtor weeks	5.50	5.80	4.90	5.10	6.20
Debtors more than 60 days (% of total)	5.00	?	?	?	?
Invoice queries (% of total)	5.00	1.50	1.40	0.80	2.70
Credit notes as a % of revenue	0.50	?	?	?	?

Other Information

Particulars	SG '000	HK '000	NY '000	NZ '000
Debtor Aging Analysis (extract)				
Less than 30 days	1,950.00	2,250.00	1,770.00	3,000.00
31 – 60 days	481.50	199.50	229.50	828.00
Value of Credit Notes raised during the period ('000)	67.50	54.00	42.00	198.00

Note : PHL operates all year round.

Required :

Prepare a report for the directors of PHL.

- ANALYSE the comparative performance of the four warehouses.
- ASSESS PHL from perspective of financial performance, service quality, resource utilisation, flexibility, innovation, and competitiveness; and
- EVALUATE the performance measurement system at PHL.

Solution 21 :**Report**

To: The Directors of PHL

From: Management Accountant

Subject: Warehouse Performance

(i) Please refer points table given below :

NY has achieved the best performance with (12) points. SG and HK have given a reasonable level of performance with (8) points each. NZ is under performed earning only (4) out of the twelve points.

NY is the only warehouse which has achieved both increased revenue and increased profit over targets.

In the courier delivery services and customer care, NY has achieved all (6) of the target standards, SG (4); HK (3). The data of NZ indicates, the need for investigation due to achievement of only (1) out of six targets.

In respect of the credit control and administrative efficiency, HK and NY have achieved all (4) standards and SG has achieved (3) of the four standards. Once again, NZ is the 'bad performer' and achieved only (2) of the four standards.

- (ii) The terms mentioned in the question might be seen as representative of the dimensions of performance. The analysis of dimensions may be translated into results and determinants.

Results are the outcome of decisions and actions taken by management in the past. Measurement of the results may be done by focusing on financial performance and competitiveness. *Financial performance* may be measured in terms of revenue and profit as shown in the points table. The points system shows which warehouses have achieved or exceeded the target. Besides, liquidity is another criterion for the measurement of financial performance. The total points in table showed that HK and NY warehouses appear to be the best performer in aspects of credit control. *Competitiveness* may be assessed in terms of sales growth or in terms of market share or increase in customers etc.

The determinants are the factors which may be seen to contribute to the achievement of the results. In other words, Determinants refer to the forward looking dimensions of Fitzgerald and Moon model, for example - what areas of future performance are most important for PHL to achieve positive financial and competitive results? Quality, resource utilization, flexibility and innovation are the determinants of future success and they are also the contributors to the achievement of competitiveness and financial performance.

In PHL a main *quality* issue seems to be courier delivery services and customer care. Points table shows that the NZ warehouse has a major problem in this area and achieved only (1) point out of the six available.

Resource utilisation for PHL is critical to its financial success and may be measured by effective and efficient use of drivers, vehicles, and financial resources. To some extent, such measurement can be seen in the data relating to courier delivery services and customer care. For example, the reason of late collection of couriers from customers may be a shortage of vehicles and/or drivers. Such shortages might be due to sickness, staff shortage, problems of vehicle availability, vehicle maintenance etc.

Flexibility may be an issue like varied range of service as to meet different segment of customer is unavailable. Possibly, a short-term sub-contracting of vehicles or collections or deliveries may help in overcoming late collection problems.

The points table i.e. 'target vs actual' may be considered as an example of *innovation* by PHL. This gives a comprehensive set of measures providing an incentive for improvement at all warehouses. The points table may demonstrate the extent of achievement or non-achievement of PHL strategies for success. For instance – the firm may have a customer care commitment policy which identifies factors that should be achieved on a continual basis. For example, timely collection of couriers, misdirected couriers re-delivered at no extra charge, prompt responses to customer claims and compensation for customers.

- (iii) The performance measurement system used by PHL is simple to use. However, it may be looked upon measuring the right things since the specific measures used in points table encompass a range of dimensions designed to focus the organization on factors essential for PHL's success and not restricted to traditional financial measures.

At PHL, internal benchmarking has been used to provide sets of absolute standards that all warehouses are expected to achieve. This will help to ensure a continuous focus upon the adoption of 'best practice' at all warehouses. Benchmarks on delivery performance give

importance to quality of service whereas benchmarks on profitability i.e. target profits focus solely upon profitability.

Incentive schemes have been used at PHL, linking the achievement of firm targets with rewards. It might happen that the profit incentive would act as a booster to each warehouse management team. However, what is required for the prosperity of PHL is a focus of management on the determinants of success rather than the results of success.

Workings :

Warehouse – Points Table

Particulars	SG	HK	NY	NZ
(A) Revenue and Profit				
Revenue	0	1	1	1
Profit (see note 'a' below)	1	0	1	0
Total Points earned ... (A)	1	1	2	1
Ranking	II	II	I	II
(B) Courier Delivery Services and Customer Care				
Late collection of couriers	1	0	1	0
Misdirected couriers	0	1	1	0
Delayed response to complaints	1	1	1	0
Delays due to vehicle breakdown	0	0	1	0
Lost items	1	1	1	0
Damaged items	1	0	1	1
Total Points earned ... (B)	4	3	6	1
Ranking	II	III	I	IV
(C) Credit Control and Administrative Efficiency				
Average Debtor weeks	0	1	1	0
Debtors more than 60 days (see note 'b' below)	1	1	1	1
Invoice queries (% of total)	1	1	1	1
Credit notes (% of revenue) (see note 'c' below)	1	1	1	0
Total Points earned ... (C)	3	4	4	2
Ranking	II	I	I	III
Total Points ... (A)+(B)+(C)	8	8	12	4

(a) Profit Points Calculation

Target Results e.g. $SG = 3.60/24.00 = 15\%$

Actual Results e.g. $SG = 3.45/22.50 = 15.3\%$ (1 point)

Target Results e.g. $HK = 3.15/21.00 = 15\%$

Actual Results e.g. $HK = 3.60/27.00 = 13.33\%$ (0 point) and so on ...

(b) Debtors more than 60 days (% of total)

Particulars	SG	HK	NY	NZ
(a) Actual Revenue ('000)	22,500	27,000	21,000	33,000
(b) Average Debtors (in weeks)	5.80	4.90	5.10	6.20
(c) Total Debtors [a x b / 52]	2,510	2,544	2,060	3,935
(d) Less than 30 days [given]	1,950	2,250	1,770	3,000
(e) 31 – 60 Days [given]	481.5	199.5	229.5	828
(f) Debtors More than 60 days [c - d - e]	78.50	94.50	60.50	107.00
(g) More than 60 days (% of total) [f/c x 100]	3.13	3.71	2.94	2.72

(c) Value of credit notes raised as a % of revenue

$SG = ₹ 67.50 / ₹ 22,500 \times 100 = 0.30\%$ [Below 0.5%, hence 1 point]

$HK = ₹ 54.00 / ₹ 27,000 \times 100 = 0.20\%$ [Below 0.5%, hence 1 point]

$NY = ₹ 42.00 / ₹ 21,000 \times 100 = 0.20\%$ [Below 0.5%, hence 1 point]

$NZ = ₹ 198 / ₹ 33,000 \times 100 = 0.60\%$ [Above 0.5%, hence 0 point]

Performance Measurement in Not for Profit Sector

It is important to understand the nature of not-for-profit organisation in order to appreciate the dynamics of performance evaluation in such organisations. Not-for-Profit organisations are generally formed for social causes like healthcare, education, infrastructure development, environmental causes, charitable causes etc. They are also formed for rendering services to the members and operate on a no-profit and no-loss basis. Examples include professional bodies (e.g. ICAI, IMA, FICCI etc.), societies formed for maintenance of residential complex, political parties etc. Not-for-profit organisations are also referred to as NGOs, Charitable organisations, Voluntary organisations etc.

As the name suggest, unlike in the case of a for-profit organisation, the underlying objective of these organisations is not to earn profits and distribute dividends to its members. The for-profit organisations have an ultimate objective of shareholder's wealth maximization and hence the performance can be measured using financial measures like profitability, return on net assets, economic value added, residual income etc. Since a not-for profit organisation is focused on certain causes and is not focused on financial returns, performance measurement can be tricky.

The not-for-profit organisations are formed for certain specific mission and objectives. For example - an organisation formed to provide free education to poor children is formed with a specific mission to provide access to education to those who are deprived. These organisations also need funds to achieve the mission and objectives which are contributed by donors and members. The organisation, thus, has fiduciary responsibilities to those contributing funds and must ensure that the funds are deployed to meet the intended mission and objectives. Thus, though the not-for-profit organisations are not focused towards earning profits, the financial measures are equally important as non-financial measures, to measure their performance.

Why do we need performance measure in Not-for-Profit Organisations?

As discussed earlier, a not-for-profit organisation does not exist for earning profits but for achieving certain social or charitable cause. The activities carried out by such organisations must be measured to give a confidence to the donors/ members that the resources contributed are being utilised efficiently and effectively.

However, performance measurement in such not-for-profit organisations is not easy. The following are **key challenges** for measuring performance in not-for-profit organisations –

- Benefits cannot be quantified
- Benefits may accrue over a longer term
- Multiple objectives
- Measurement of utilization of funds and expenditure

1. Benefits cannot be quantified

A large part of benefits derived from the activities of these organisations are not quantifiable. For example - if a not-for-profit organisation is formed for providing free education to poor students, the benefits derived by the students cannot be quantified. In some cases, an organisation might spend money to provide better ambulance services to its patient. The benefits of saving lives of patients cannot be measured in financial terms. Hence, it is difficult to evaluate performance of not-for-profit organisations using financial measures.

2. Benefits may accrue over a longer term

The expenditure incurred in one year may yield benefits over several years. A hospital may invest in creating ICU (Intensive Care Units) facility, the benefit of which will be obtained over multiple years. Such benefits cannot be measured reliably.

3. Measurement of utilisation of funds & expenditure

Some not-for-profit organisations spend the entire money as per budget and do not earn any revenue. The assessment of whether the spending has been appropriate is a key challenge. The organisations may resort to rampant spending simply to meet the expenditure targets. Many organisations get additional funds if they achieve the expenditure targets and this could be a motive for increase spending.

4. Multiple objectives

Many not-for-profit organisations are formed for multiple objectives. The prioritisation of objectives can be a challenging task.

Performance Measurement

Despite the challenges highlighted above, it is imperative that the performance measurement is carried out for not-for-profit organisations. This helps the members, donors and other stakeholders to get a comfort that the organisation is working towards desired objectives and mission.

Value for Money (VFM) Framework

A framework which can be used for measurement of performance in not-for-profit sector is the Value for Money framework. Not-for-profit organisations are expected to provide value for money which is demonstrated by:

- **Effectiveness:** Whether the organisation has achieved its desired mission and objectives? It simply means, spend wisely.
- **Efficiency:** Whether the resources and funds available to the organisation has been utilised efficiently i.e. maximum output has been obtained with minimum input? It simply means, spend well.
- **Economy:** Whether the desired output has been obtained using the lowest cost? It must be noted that use of lowest cost approach should not compromise quality. It simply means, spend less.

Example of a Charitable School

Let's consider a case of a school which provides free education to children who come from BPL (below the property line) families. The school also provides free lunch to the students to encourage daily attendance.

A measure of **effectiveness** is whether the school has been able to provide quality education to desired number of students. The performance of the school can be measured using the metrics of number of students dropping out of school year-on-year.

Another measure of performance could be the number of students who have successfully completed the 12th exams and joined college. It is important to note that the measures might not be wholly within the control of the school. A student might drop out even after best efforts by the school. This makes the performance measurement a challenging task.

A measure of **efficiency** could be the number of students trained per hour spent by teachers or the students to teacher ratio. In case of schooling a lower student to teacher ratio is always preferred.

A measure of **economy** would be the amount spent on maintaining the school premises, amount spent on remuneration to teachers etc. The amount spent can be compared against the budgeted expenditure or sanction amount.

If performance is measured based on cost incurred, the school might as well decide to cut necessary expenditure to meet the expenditure budget. For example, the school might not spend adequate amount to upkeep the library or computer equipments. This can be detrimental in the longer run. Hence, it is important to balance the financial measures with non-financial measures.

Adapted Balanced Scorecard

Kaplan developed the 'Adapted Balanced Scorecard' for measuring performance at NGOs. The main assumption of this adapted scorecard is that mission statement and not profits is the main point to be met. The following four perspectives are suggested in the adapted balanced scorecard:

Customer Perspective – Satisfaction of beneficiary and other stakeholder's interest.

Financial Perspective – Fund raising, funds growth and funds distribution.

Internal Processes Perspective – Internal efficiency, volunteer development, information communication and quality.

Innovation and Learning Perspective – The capability of organisation to adjust to the changing environment.

It is important to note that the positioning of financial perspective and customer perspective is switched. This is due to the fact that achieving financial success is not the primary objective for these organisations. Instead, nonprofit organisations should be primarily concerned with how efficiently and effectively they meet the needs of their beneficiaries and donors/ members.

Other Performance Measures

- The ability to raise funds to meet the objectives efficiently.
- Submitting periodic reports to the stakeholders in a transparent manner.
- The best use of financial as well as non-financial resources to achieve desired objectives and mission.
- The long- term impact (benefits) of the activities of the not-for-profit organisations.
- The quality of services provided by the organisations.

Question 22 : [RTP - Nov. 2018]

[Also appeared in November, 2020 exam with name changed as Taj Mahal]

Case Study :

The town of Silver Sands is located along the coast of the Caribbean Sea. Known for its beautiful coastline and pleasant weather, the town attracts a lot of tourists from all around the world. The town has two beaches that are maintained by the local government and can be used by the general public. In order to preserve the natural ecosystem, other beaches on the coastline are not accessible to the general public. Tourism is the main source of livelihood for its residents. Consequently, cleanliness of beaches is of paramount importance in order to sustain and develop this industry.

The local government has recently employed a contractor to clean up the beaches using beach cleaning machines. The contractor has been selected through a competitive tendering / bidding process. The contractor uses sand cleaning machines that are pulled by tractors. Sand is scooped onto a conveyor or screening belt. It is either raked through (combed using prongs) or sifted through (filtered), in order to separate the waste from the sand. The cleaned sand is left behind on the beach while the waste is removed. Majority of the litter comprises of plastic waste (bags, bottles etc.) while some portion also includes sea weed, glass, aluminum cans, paper, timber, and cardboard. A detailed log is kept by the contractor about the stretch of beach that has

been cleaned, time taken for the clean-up, number of tractors used etc. This log is also checked and signed by a local government official. This record is used to process payments at the end of the month.

In addition to contracting with the vendor to clean beaches, the local government has also placed bins at various locations on the beach for the public to dispose their waste. The town's municipality workers clean these bins every morning. Again, detailed logs of the man power and other resources employed is kept by the responsible department. In addition, the government has opened a mobile messaging system, whereby the public can message the government department if they find litter anywhere in the beach. Depending on whether it is from overflowing bins or buried debris in the sand, the municipality workers or the contractor will take action to clear it within 24 hours. A detailed log of these operations is also maintained. Patrons can also suggest measures for improving cleanliness on the beaches.

Due to its importance to the economy, the local government has allotted substantial budget for these operations. At the same time, it is essential to know if this is sufficient for the purpose of keeping the beaches clean. Therefore, the government wants to assess whether the town is getting "good value for money" from this expenditure. The "value for money" concept can be looked at from three perspectives: (i) economy, (ii) efficiency and (iii) effectiveness. The Internal Audit (IA) department that has been requested to undertake this study, has requested for guidelines on whether the audit should focus on economy and efficiency of the beach cleaning operations or on effectiveness of the same. Economy and efficiency audit would assess whether the same level of service can be procured at lower cost or resources while effectiveness audit would assess whether better services can be procured at same cost.

Depending on the outcome of the audits, if required, policy decisions like requesting for additional funding from the state government, alternate policy measures like levying penalty for littering etc. can be taken.

Required :

Prepare a letter addressed to the IA department.

- (i) RECOMMEND guidelines to assess economy and efficiency of beach cleaning operations.
- (ii) RECOMMEND guidelines to assess effectiveness of beach cleaning operations.
- (iii) IDENTIFY challenges involved in assessment of effectiveness?
- (iv) RECOMMEND general guidelines, how the audit team may conclude the audit based on the combined outcomes of economy, efficiency, and effectiveness?

Answer 22 :

Dear Sirs,

Re: The economy, efficiency and effectiveness of beach cleaning activities

- (i) Economy and efficiency audit of an operation focuses on the consumption of resources and the output achieved. Economy assesses the financial aspects of the activity i.e. are the objectives of the activity being achieved at reasonable cost? Efficiency assesses the volume of input consumed to derive the desired output i.e. are the resources and funds being consumed to get maximum output?

To look at Economy of Operations, cleaning expenses need to be bifurcated into payments made to the contractor and the expenses of emptying waste from bins. Any further subcategories of these expenses, like labour, material, disposal van expenses etc. also need to be collated from the accounting or cost records. These then have to be compared to the budgets that were approved by the government of Silver Sands. The competitive tendering process can be reviewed to ensure that the contractor getting the order is offering the required quality of service at the lowest price. If the quality of cleaning has been achieved, by

staying within budget, the operation is economical. However, if the actual expenses exceed the budget, the government has to compare them with cost of similar cleaning activities carried by neighbouring towns. On comparison, if Silver Sands operations are expensive compared to other towns, it indicates that not only are the operations uneconomical they may not be efficient either.

Efficiency of Operations can be determined by checking the log records maintained for beach cleaning by the contractor and municipality workers. These would have details of activities carried out and the resources utilized for each of them. For each of these services (beach cleaning and emptying out bins), the cost drivers can be identified and certain metrics can be developed for analysis. For example, the cost of running the tractors can be divided by the total number of tractors operated to get the cost of operations per tractor or alternatively, by the kilometers of beach cleaned to arrive at a tractor-kilometer rate. While analysing these activities, certain operational considerations have to be given. For example, certain stretches of the beaches may take more time or resources to clean due to issues like rocks or soft sand. Therefore, if resources for operations are disproportionate for certain parts of the beaches, the cost of maintaining those stretches need to be worked out. Data to get this information will depend on the extent of details maintained in the logs. This information has to be tracked over some period of time in order to understand trends in operations and related expenses.

The data collected from the mobile messaging system should also be investigated. How often and in what stretches of the beach are complaints frequent or maximum? Reasons for these lapses need to be taken from the contractor (for beach cleaning operation) and the concerned department (for emptying bins) in order to find out whether resources are being employed properly.

On this basis, deviations and exceptions should be investigated. The local government can then decide if there can be alternate sites along the coastline that may be more economical and efficient to operate.

- (ii) An audit about Effectiveness of Operations would focus how the actual cleanliness of beaches compares with the desired level as laid out in the policy initiative. To assess whether performance has been met, clear guidelines and metrics have to be defined during policy implementation.

To begin with, it should be clear as to what constitutes litter. From an operational angle, it would be difficult to clean out every bit of paper lying on the beach. However, it is possible to pick up every soft drink aluminum can. Hence, the government authorities must be clear on what constitutes litter? Which are the refuse that must be cleared within exception (example food refuse, animal droppings, glass bottles, tin cans, trash bins etc.) and tolerance level for certain other types of litter (e.g. Paper, seaweed etc.) that may get left behind even after cleaning. Quantity of waste collected would be the indicator to make the above assessment.

Certain other parameters like safety standards can also be defined. Safety problems could be cuts from sharp objects like glass, incidents of vector borne diseases in the area or health problems from polluted sea water. Assessment has to be made whether these standards have been met.

For this, the primary source of information about cleanliness would be feedback from the beach patrons. These could be in the form of complaints received directly or those through the mobile messaging system would provide data to work out the metrics. This would be an indicator of "customer satisfaction". Other inputs could also be the suggestions given by the patrons about ways to improve cleanliness on the beach.

Observation by making surprise visits to inspect the beaches immediately after the cleaning operations would also provide sufficient evidence about the effectiveness of operations.

(iii) Challenges Involved in assessment of effectiveness would be:

- (a) Defining standards about what constitutes litter and acceptable level of cleanliness? These are subjective guidelines, the perception of which may differ from person to person.
- (b) Beach patrons also play an important role in making this initiative effective. There has to be a conscious civic sense of duty not to litter, failing which this initiative will most likely be ineffective. Therefore, while measuring performance for effectiveness, collection of more litter does not necessarily indicate effective operations. More litter requires more cleaning and more resources, therefore is actually not a positive indicator of effectiveness. On the contrary, in the long run, lesser litter collected to maintain desired level of cleanliness would be a good indicator of effectiveness.

(iv) The outcome of the audits can indicate achievement of each one or none of the three parameters of economy, efficiency and effectiveness of the beach cleaning operation. To form an integrated conclusion based on the different outcomes of individual audits, the audit team may consider the following guidelines:

- (a) Has the objective of the cleaning operation been achieved as per the guidelines in the relevant policy? i.e. have the operations been effective?
- (b) If the answer to (a) is yes, are the expenses within budget. If so, then the operations are economical and efficient. Given that the operations have been effective at the same time economy and efficiency have been achieved, the team can conclude that the cleaning operations policy has been a success.

A cost-over run can also be justified if the operations have been effective. In that case, the audit team has to conclude whether all expenses incurred are indeed justified and that the resources have been put to the best possible use. If not, can the operations be made more economical or efficient?

- (c) If the answer to (a) is no, the operation has not been effective, then is the difference from the target marginal or huge? If the operations have not been entirely effective, but only by a marginal gap say 95% success, then analysis of expenses can be made similar to the point (b) mentioned above. However, if the operations have been ineffective to a larger extent, then the cleaning drive initiative has been ineffective. The government has to look at alternate solutions of tackling the problem. These could include imposing heavy penalty for littering, requesting for more funding from the state government to employ better resources etc.

Therefore, it can be seen that achievement of one objective does not automatically lead to achievement of other objectives. A holistic approach would be needed to draw conclusions about the performance of the cleaning operations.

Should you have any further queries, please do not hesitate to ask.

Yours Faithfully

Management Accountant

Linking of Financial & Non-Financial Measures of Performance

The main objective of profit-making organizations is to maximize shareholder value. Hence, performance measures should be based on the value created by each division. Regrettably, using accounting measures such as ROI or EVA as performance measures can inspire managers to become short-term oriented. The incorporation of non-financial measures created the need to link financial and non-financial measures of performance. In particular, there was a need for a balanced set of measures that provide both short-term performance measures and also long term financial performance from current actions.

The requirement to link financial and non-financial measures of performance and to identify key performance measures is provided by the following theories:

- Kaplan and Norton's 'Balanced Scorecard'
- Cross and Lynch's 'The Performance Pyramid'
- Fitzgerald and Moon's 'Building Block Model'
- Andy Neely and Chris Adams's 'The Performance Prism'

Linking of Critical Success Factors (CSFs) to Key Performance Indicators (KPIs)



Brief Introduction :

Corporate Vision – It tells us 'where' to go i.e. Destination

Corporate Strategy – It tell us 'how' to reach the destination i.e. Path to be followed

Critical Success Factors (CSF) – It tells us 'what' to do i.e. Goals to be achieved

Key Performance Indicators (KPI) – It helps us to measure how far we have achieved the goal

Detailed Discussion :

Critical Success Factors (CSF) are often misunderstood as a synonymous or similar term to Key Performance Indicators (KPI). In reality, these two terms are actually very different and understanding the difference between these two terms is a vital step in implementing Business Performance Measurement.

Critical Success Factors are elements tied to the strategy of business and they represent objectives that businesses are trying to achieve. They are derived from the strategic goals, and are in essence, an attempt to go one level deeper into the high-level strategic goals, and lay them out as a list of categorized objectives that will collectively drive the company's strategy forward.

To put it very simply, Critical Success Factors represent the 'what' – what are the things the company needs to do in order to achieve its goals.

Key Performance Indicators, on the other hand, are a consequence of critical success factors – they represent the 'how'. Having outlined 'what' businesses want to achieve, a company must subsequently define sets of measures and associated targets in such a way that achieving those targets will translate into successful completion of a CSF.

For example, for an IT Department, a Critical Success Factor could be restoring normal service quickly in case of a disaster. In order to achieve that, a logical KPI would be the Average Turnaround Time, with a target of 4 hours. The Average Turnaround Time and its target of 4 hours is the KPI that represents 'how' the IT department achieved its Critical Success Factor.

Ideally, each critical success factor should have a KPI associated with it. A single Critical Factor can also have more than one KPI, if need be. The KPI targets are more formally called thresholds, and the thresholds must be ascertained with a great deal of industry analysis, as well as internal analysis. KPI targets should be SMART i.e. Specific, Measurable, Achievable, Relevant and Time Constrained.

In order to truly achieve effective measurement of business performance, the KPIs must be selected and designed in a way that ensures that the CSF is delivered if the KPI meets the threshold, and the CSFs in turn must be designed and constructed in a way that ensures that the company's strategic vision is delivered if the CSFs are met.

The objectives, CSFs, and KPIs together represent a chain of links that together deliver a company's strategic goal, by breaking down that strategic vision in to a set of quantifiable targets.

The CSFs should also be reviewed and evaluated with respect to the company's high-level strategic goals. Having KPIs set up without a well governed feedback and monitoring process can result in a company aimlessly chasing targets which don't ultimately deliver the company's strategy.

Setting up KPIs is a step in the right direction, but the benefit of KPIs is only truly realized when they are implemented in the right way, and understanding their linked relationship with CSFs and objectives is paramount to this effect.

Summary :

David Otley (2005) has observed that though there are various models to measure the corporate or divisional performance, like - balanced scorecard, performance prism, building block model, performance pyramid etc. A common thread in all of them is that performance measures should:

- be allied to corporate strategy.
- include internal as well as external measures.
- include financial as well as non-financial measures.
- make explicit the trade-offs between different dimensions of performance.
- include all important but difficult to measure factors as well as easily measurable ones.
- consider measures for managers / employees' motivation.

Performance Reports

Responsibility Accounting is implemented by issuing performance reports at frequent intervals that inform responsibility centre managers of the deviations from budgets for which they are accountable and required to take action.

Performance reports are useful for not only comparing budgeted results to actual results, but for also showing managers the effects of activity changes and how well these changes are controlled by management. Note that the reports start from the bottom and move upward with each manager receiving information on the operations of the unit for which he is directly responsible and summary information on performance of other lower level managers under their direct or indirect control.

No matter how much authority and autonomy is given to responsibility managers, performance reports are needed to evaluate the performance of the managers at all operating levels of the organization. At bottom levels, it helps in determining what all corrective measures are required in their segments. At top management level, these reports keep the top managers informed on the performance of all segments.

Question 23 :

Nicefit Ltd. manufactures ready-made garments by a simple process of cutting the cloth into various shapes and then sewing the corresponding pieces together to form the finished product.

The Sewing Department and the Cutting Department report to the Production Manager who along with Engineering Manager reports to the Director Manufacturing. The Sales Manager, Publicity Manager and the Credit Manager reports to the Director Marketing who along with Director Manufacturing report to the Managing Director of the company.

The Accounts Department reports the following for the last quarter.

Particulars	Budget(₹)	Actual(₹)
Bad Debt Losses	5,000	3,000
Cloth used	31,000	36,000
Advertising	4,000	4,000
Audit Fees	7,500	7,500
Credit Reports	1,200	1,050
Sales Representative - Travelling Expenses	9,000	10,200
Sales Commission	7,000	7,000
Cutting Labour	6,000	6,600
Thread	500	450
Sewing Labour	17,000	18,400
Credit Dept. - Salaries	8,000	8,000
Cutting Utilities	800	700
Sewing Utilities	900	950
Director Marketing - Salary and Admn. Exps.	20,000	21,400
Engineering Exp.	13,000	12,200
Sales Management - Office Expenses	16,000	15,700
Production Manager - Office Expenses	18,000	17,000
Director Manufacturing - Salary and Admn. Exps.	21,000	20,100

Using the above data, prepare responsibility accounting report for the Director-Marketing, the Director-Manufacturing and the Production Manager.

Question 24 :

AB Ltd. manufactures foam, carpets and upholstery in three divisions. These are treated as profit centers. Its operating statement for a particular year shows the following performance of these divisions :

(Figures in Rs. '000)

Particulars	Foam	Carpet	Upholstery	Total
Sales Revenue	1,600 (a)	1,200	1,200	4,000
Manufacturing Costs :				
Variable	1,200	700	680	2,580
Fixed (traceable)	--	100	20	120
Subtotal	1,200	800	700	2,700
Gross Profit	400	400	500	1,300
Expenses :				
Administration	134	116	172	422
Selling	202	210	232	644
Subtotal	336	326	404	1,066 (b)
Net Income	64	74	96	234
Division's Ranking	3rd	2nd	1st	

Notes :-

- Sales include foam transferred to the Upholstery division at its manufacturing cost of Rs. 2,00,000.
- Common expenses of Rs. 1,30,000 and Rs. 1,00,000 on account of administration and selling respectively stand apportioned to these divisions at 10% of Gross profit in case of administration and 2.5% of Sales in case of selling expenses. Rest of Rs. 8,36,000 of the expenses are traceable to respective divisions.

The manager of the foam division is not satisfied with the above approach of presenting operating performance. In his opinion his division is the best among all the divisions. He requests the management for preparation of revised operating statement showing internal transfer at market price and charging traceable fixed cost only to the divisions.

You are required to :

- Draw the revised operating statement using divisional profit approach and pricing the internal transfer at market price.
- Compute relevant ratios to show comparative profitability of these divisions and rank them in the light of your answer at (a) above. Further, offer your comments on the contention of the manager of foam division.
- State why the divisional profit approach and pricing of internal transfers at market price are more appropriate in realistic assessment of the performance of various divisions.

9

DIVISIONAL TRANSFER PRICING

What do we mean by Transfer Pricing ?

Transfer Price is the price which one unit of an organisation charges to another fellow unit of the same organisation for the goods or services supplied. Transfer Pricing is the decision making process by which the management of the organisation decides upon the price to be charged to fellow units for such goods or services.

In this chapter, our focus is more on inter-divisional transfer of goods and services. Management accounting system at the divisional level should determine a value for such transactions. This valuation is defined as transfer pricing.

Objectives of Transfer Pricing :

- (a) To foster a commercial attitude in those executives who are responsible for the performance of profit centres. The main emphasis here is on profitability. This objective compels the units to improve their profit position.
- (b) To optimise the profit of the concern over a period of time. Here the stress is on maximum utilisation of plant capacity.
- (c) To optimise the allocation of concern's financial resources. This is a long term objective. The allocation of resources is based on relative performance of various profit centres, which in turn are influenced by transfer pricing policies.
- (d) To promote healthy competition amongst the sister units of the same concern.
- (e) While each division works towards achieving its individual objective, holistically, their goals have to align with the organization's overall business objectives. This concept is called as "goal congruence".

Utility of Transfer Pricing

Following are the notable uses of transfer pricing:

- (i) **Performance evaluation:** Each division becomes accountable for its profits, which is a key to evaluate its performance. This motivates each manager to maximize the division's profitability. Consequently, it improves the scope for company's overall profitability.
- (ii) **Employee engagement and compensation:** Often managers are compensated based on performance of the division they are responsible for. Since transfer pricing influences financials, it must be priced at a rate that is perceived to be fair by all the concerned divisional managers. Transfer pricing that is detrimental to a division could affect employee morale.
- (iii) **Resource allocation:** Co-ordination among units for production and sales enables better allocation and utilization of its resources like capacity, manpower etc. Based on transfer price, key decisions regarding operations may be taken, e.g. to produce material in-house or purchase from outside, to expand operations etc. Primary aim of these decisions would be to maximize profits, while also promoting goal congruence among divisions.

- (iv) **Taxation and profit remittance:** Transfer pricing will impact earnings of multi-national companies having inter-divisional transfers. This could affect the over-all tax burden for the company as well as the profits that may need to be repatriated to its head office.

A Question of Fair Value?

Transfer pricing is often associated with the term “arms-length” price. This implies that the price for inter-divisional transfer has to be fair and competent enough as if dealing with a third party. The application of the concept of “arms-length” price is more important from taxation perspective.

In the accounting records, transfer price would be treated as revenue for the division supplying the goods / services and it will be treated as cost for the division receiving the goods/service. When each division is made accountable for profit, any transaction between them becomes more business driven. It is like how customers and suppliers compete using bargaining power to set the price. Arriving at a “good-deal” for the division becomes imperative because it influences its profitability. Hence, fair value from a business perspective depends on how each division finds the price compatible with its profit targets.

Question 1 :

Division ‘A’ produces goods at a cost of ₹ 10 p.u. and it transfers the goods to Division ‘B’ at cost plus 20%. The transfer price is set according to transfer pricing policy of the company.

Division ‘B’ has to incur an additional costs of ₹ 5 p.u. Division B sells externally at ₹ 16 p.u.

Calculate:

- (i) Profit of each division and the overall profit the company.
- (ii) Write a brief analysis of the results including behavioural consequences.

Solution 1 :

(1) Profitability Analysis

Transfer Price for Division ‘A’ = ₹ 10 p.u. + 20% = ₹ 12 p.u.

Profit earned by Division ‘A’ = ₹ 12 p.u. - ₹ 10 p.u. = ₹ 2 p.u.

Cost for Division ‘B’ = ₹ 12 p.u. + ₹ 5 p.u. = ₹ 17 p.u.

Profit earned by Division ‘B’ = ₹ 16 p.u. - ₹ 17 p.u. = Loss ₹ 1 p.u.

Overall cost to the company = ₹ 10 p.u. + ₹ 5 p.u. = ₹ 15 p.u.

Overall profit to the company = ₹ 16 p.u. - ₹ 15 p.u. = ₹ 1 p.u.

(2) Brief Analysis of the Result

As shown above, Division A shows a profit of ₹ 2 while Division B shows a loss of ₹ 1. Division A incurs 2/3rd of the cost while Division B incurs only 1/3rd of the cost. The overall net profit margin for the product is 6.67% of the cost to the company (i.e. 1/15). However, the internal mark-up that Division A charges to Division B is 20% of cost. Therefore, Division A will always make a profit and Division B will always be a loss-making unit.

(3) Behavioural Consequences

Manager of Division B is not motivated, since performance of his unit is affected by a higher internal mark-up. Moreover, since the manager of Division A will always make a profit under this method, he will not take efforts for reducing the cost. The management can take steps to review the following:

- (i) Is the transfer pricing policy of cost plus 20% justified? If so, should the pricing policy for external customers be revised?
- (ii) What share of Division A's costs are controllable? Is it possible for Division A to take measures for cost reduction and charge Division B a lower amount?
- (iii) Alternatively, should Division B be allowed to source the component from outside?

Question 2 :

AB Cycles Ltd. has 2 divisions, A and B which manufacture bicycle. Division A produces bicycle frame and Division B assembles rest of the bicycle on the frame. There is a market for sub-assembly and the final product. Each division has been treated as a profit centre. The transfer price has been set at the long run average market price. The following data are available to each division:

Estimated selling price of final product	Rs. 3,000 p.u.
Long run average market price of sub-assembly	Rs. 2,000 p.u.
Incremental cost of completing sub-assembly in division B	Rs. 1,500 p.u.
Incremental cost in division A	Rs. 1,200 p.u.

Required :

- (i) If division A's maximum capacity is 1,000 units p.m. and sales to intermediate are now 800 units, should 200 units be transferred to B on long term average price basis.
- (ii) What would be the transfer price, if manager of division B should be kept motivated?
- (iii) If outside market increases to 1,000 units, should division A continue to transfer 200 units to division B or sell entire production to outside market?

Methods of Transfer Pricing

The methods of pricing usually employed in industry when goods or services are transferred from one unit to the other can be broadly classified under the following four categories :

1. Market Price Method
2. Shared Profit Method
3. Cost Based Methods – It includes following 4 variations:
 - (a) Marginal Cost Based
 - (b) Standard Cost Based
 - (c) Full Cost Based and
 - (d) Cost plus Mark Up Based
4. Negotiation Based

1. Market Price Method

Transfer price is based on market price of goods or services prevailing in the market. In such case, the internal transfers are done at market price. The internal transfer can either be recorded at the external market price or adjusted for any costs that can be saved by internal transfer e.g. selling and distribution expenses, packaging cost.

Advantages

- Since demand and supply determine market price, it is likely to be unbiased.
- Market prices are less ambiguous compared to cost-based pricing. They cannot be manipulated.
- Since the pricing is competitive, divisional performance can be linked more objectively to its contribution to the company's overall profits.

Disadvantages

- Market price may not be completely unbiased, if a competitive environment does not exist. Examples could be a distress sale or manipulative pricing strategies (like price discrimination) that could distort the market price.
- May not be suitable when market prices can fluctuate widely or quickly.
- Goods that are transferred may be at an intermediate stage in the production process. At times market price may not be available for such intermediate goods.

Behavioural Consequences

The existence of an external market promotes competitiveness within the entity. Both managers will be motivated to improve performance. The supplying division will have to compete with the outside vendor that may lead to cost competitive operations. The purchasing division has more alternatives to choose from. However, the purchasing division must ensure that quality of the goods is also comparative. Generally, goods produced in-house may be as per specifications unique to the company's products. Goods purchased externally may require additional work that involves additional cost.

2. Shared Profit Method

Shared profit relative to cost method is an alternative to market price method. Cost incurred by each division indicates the value it has added to the product cost. The cost added by each division is finally used to arrive at the selling price of the final product. The primary advantage of this method is that it allocates profit based on the proportion of value addition to the product in terms of cost.

However, the disadvantage is that the divisional manager is not held responsible for the cost incurred in his division. We are unable to judge the efficiency of each division properly. On the contrary, a division in which cost incurred is higher will get a higher share of profit inspite of inefficiency in operation.

3. Cost Based Transfer Price

Cost based pricing models are based on the internal cost records of the company. They may be used when the management wants to benchmark performance with the cost targets set within the company. Cost based methods may also be used when market prices for the goods cannot be determined due to lack of comparable market. Cost based transfer price may consider variable cost, standard cost, full cost and full cost plus mark-up. Therefore, the basis for cost price may be subjective and has to be adapted based on its suitability to the entity.

Advantages

- Performance can be benchmarked to internal cost targets (budgets).
- Information is more easily available as compared to market price. While evaluating performance, cost components can be broken down further for internal analysis. Hence, the basis for transfer pricing is more clearly defined as compared to market price, which may be subject to the uncertainties of demand and supply.

Disadvantages

- The internal cost on which transfer pricing is based, can be subjective since there can be multiple ways of interpreting costs. Variable cost, standard cost, full cost are some of those methods. Managers may not always agree on the basis to be followed, since each will try to use the one most beneficial to their division.
- Since cost is passed on to another division, there may be instances when managers of the supplying division may find little incentive to lower the cost of production by adopting cost efficient methods.

(a) Marginal Cost Based Transfer Price

Transfer price is recorded at a marginal cost required to produce one additional unit.

Advantage

- Useful when the supplying division has excess capacity. The method ensures that the supplying division recoups the cost of internal transfer, while the purchasing division enjoys the benefit of a lower cost compared to the market price.

Disadvantage

- No fixed cost or mark-up is allowed to be charged to the purchasing division. Thus each unit transferred internally, will suffer a loss of fixed cost per unit.

Behavioral Consequences

In such a setup, profit evaluation is centralized at the entity level. Therefore, the supplying division may have little incentive to be cost efficient. Non-recovery of fixed costs would demotivate the supplying division. It may oppose certain decisions like capacity expansion or further infusion of investment, that leads to higher fixed costs.

(b) Standard Cost Based Transfer Price

Transfer price is recorded at a predetermined cost, which is based on budgets and certain assumptions regarding factors of productions like capacity utilization, labor hours etc. The difference between transfer price (i.e. standard cost) and actual cost of production will result in cost variances. Management of the company can hold the respective division responsible for adverse cost variances and can reward a division for favourable cost variances.

Advantage

- ☐ Performance evaluation can be done against budgeted cost targets. Facilitates better understanding of costs through variances. This enables the manager to take measures to improve performance.

Disadvantage

- ☐ Profit performance measurement is centralized and cannot be measured for individual divisions.

Behavioural Consequences

Budgeted costs are generally based on historic records. Hence, there is not much incentive left in improving the cost efficiency in future.

(c) Full Cost Based Transfer Price

Transfer price is based on full product cost. It includes cost of production plus a share of other costs like selling and distribution, general administrative expense, research and development etc.

Advantage

- ☐ Full cost of goods transferred is recovered hence the supplying division will not show a loss.

Disadvantage

- ☐ Since mark-up cannot be charged on internal transfers, the supplying division does not record any profit on these sales. This is a disincentive for the supplying division.

(d) Cost plus a Mark-up Based Transfer Price

Transfer price is based on full product cost plus a mark-up. Mark-up could be a percentage of cost or percentage of capital employed.

Advantage

- ☐ Since the supplying division makes a profit, this method addresses the disincentive problem discussed above in the full cost method.

Disadvantage

- ☐ Since the transfer price under this method could closely approximate its market price, the purchasing division may bear a share of the selling expenses although none was incurred for such internal sales. Again, this could distort the performance of purchasing division. Therefore, it is essential to adjust the transfer price for such cost savings.

Behavioural Consequences

The problem with using full cost as a basis for transfer pricing is that it distorts the company's cost structure while making decisions. The purchasing department would view the cost as a variable cost, since it varies in proportion to the units purchased internally. In reality, this price includes a portion of fixed cost of the supplying division, which is a sunk cost. In this case, the sales price of purchasing division will get inflated, due to higher cost of input.

In case if the purchasing division wants to buy some quantity as a very competitive price for fulfilling some special orders, the supplier division will refuse to supply below total cost. However, if there is a spare capacity left with the supplying division, then there is no incremental fixed cost. This will lead to rejection of offer by supplier division, though there is a positive contribution. In such case, management intervention is required to achieve goal congruence.

4. Negotiation Based Transfer Price

This is a price between market price and cost price. Managers of the purchasing and supplying divisions independently negotiate and arrive at a mutually agreeable transfer price like a buyer and a seller.

Advantage

- ☐ Managers are given autonomy to decide whether to purchase from outside or to buy from sister unit.
- ☐ Similarly, divisional managers get autonomy to sell in the outside market or to the sister unit internally.

Disadvantage

- ☐ This method requires sufficient external information to be available regarding the external market price, terms of trade etc.
- ☐ Internal cost information must also be shared in order to negotiate a reasonable price.

Behavioral Consequences

These negotiations act as an integrating tool among the departments, it provides for autonomy in decision making at the same time promotes goal congruence through efficient performance of the concerned divisions.

While autonomy is given to the managers, top management intervention may be required if decisions lead to sub-optimal utilization of resources. For example, when the purchasing division decides to procure from an external vendor quoting a lower price, at the same time supplying division has excess capacity, the management may have to intervene to ensure that resources are used optimally and that the decision benefits the company as a whole.

Negotiated prices depend on the ability of the manager to bargain on behalf of the division. This could affect the division's performance. The process may be time consuming that could even lead to conflict among the units.

Transfer Pricing and Goal Congruence (Range of Transfer Pricing)

Since internal transfer pricing develops a competitive setting for managers of each division, it is possible that they may operate in the best interest of their individual performance. This can lead to sub-optimal utilization of resources. In such cases, transfer pricing policy may be established to promote goal congruence.

In short, the management will always consider the best interest of the organisation, while taking the transfer pricing decision. It will differ from situation to situation in each case. We as a management consultant should always act in the best interest of the company. One can use marginal costing technique for such decision making.

The **minimum** transfer price desired by the **supplier** division

= Incremental cost per unit + Opportunity cost per unit (if any)

Note : Incremental cost = Variable cost + Any additional cost incurred by supplier division for modification, storage, transportation etc.

The **maximum** transfer price which **buyer** division can pay is

- (a) External purchase price or
- (b) Net Incremental revenue (i.e. Sales price – incremental cost of buying division)

Whichever is lower. That is lower of the above two.

Question 3 : [ICAI Module]

Division A transfers goods to Division B. Division A incurs marginal cost of ₹ 10 p.u. and Division B incurs marginal cost of 5 p.u to process it further. Division B can sell the finished product externally at ₹ 20 p.u.

To promote goal congruence:

- (i) What should be the minimum transfer price that Division A should charge? Assume there is no external market for this intermediate product.
- (ii) If Division B can buy the intermediate part externally for (a) ₹ 14 p.u. or (b) ₹ 18 p.u., what maximum price Division B will be willing to pay to Division A?
- (iii) Assume that intermediate goods of Division A can be sold externally at ₹ 12 p.u. How does this information will affect the minimum transfer price of Division A? What would be the acceptable range of transfer price for both the managers, if Division B can procure the part externally at ₹ 14 p.u.?

Practical Questions on Transfer Pricing
Question 4 :

Your company fixes the inter-divisional transfer prices for its products on the basis of cost plus a return on investment in the division. The Budget for Division A for next year appears as under :

Investment in Division A :	Rs.
Fixed Assets	5,00,000
Current Assets	7,00,000
Current Liabilities	2,00,000
Annual Fixed Cost of the Division	8,00,000
Variable Cost per unit of Product	10
Budgeted Volume	4,00,000 units p.a.
Desired ROI	28%

Determine the transfer price for Division A.

Question 5 :

Softdrinks Ltd. manufactures a product which is obtained basically from series of mixing operations. The finished product is packaged in the company made glass bottles and then packed in attractive cartons.

The company is organised into two independent divisions viz. one for the manufacture of the end-product and the other for the manufacture of glass bottles. The product manufacturing division can buy all the bottle requirements from the bottle manufacturing division.

The General Manager of the bottle manufacturing division has obtained the following quotations from the outside manufactures for the supply of empty bottles.

No. of empty bottles	Total purchase value (Rs.)
8,000	14,000
12,000	20,000

A Cost analysis of the bottle manufacturing division for the manufacture of empty bottles reveals the following production costs :

No. of empty bottles	Total cost (Rs.)
8,000	10,400
12,000	14,400

The production cost and sales value of the end product marketed by the product manufacturing division are as under :

Volume	Total Cost of End Product	Sales Value
(Bottles of end product)	(excluding cost of empty bottles)	(Packed in bottles)
Nos.	Rs.	Rs.
8,000	64,800	91,200
12,000	96,800	1,27,800

There has been considerable discussion at the corporate level as to the use of proper price for transfer of empty bottles from the bottle manufacturing division to product manufacturing division. This interest is heightened because a significant portion of the Divisional General Manager's salary is in incentive bonus based on profit centre results.

As the corporate management accountant responsible for defining the proper transfer prices for the supply of empty bottles by the bottle manufacturing division to the product manufacturing division, you are required to show for the two levels of volumes of 8,000 and 12,000 bottles, the profitability by using -

- Market price and
- Shared profit relative to the costs involved basis for the determination of transfer prices.

The profitability position should be furnished separately for the two divisions and the company as a whole under each method.

Discuss also the effect of these methods on the profitability of the two divisions.

Question 6 :

A company is engaged in the manufacture of edible oil. It has three divisions as under :

- (i) Harvesting oil seeds and transportation thereof to the oil mill.
- (ii) Oil Mill, which processes oil seeds and manufactures edible oil.
- (iii) Marketing Division, which packs the edible oil in 2 kg. containers for sale at Rs. 150 each container.

The Oil Mill has a yield of 1,000 kgs. of oil from 2,000 kg. of oil seeds during a period. The Marketing Division has a yield of 500 cans of edible oil of 2 kg. each from every 1,000 kg. of oil. The net weight per can is 2 kg. of oil.

The cost data for each division for the period are as under :

Harvesting Division :	
Variable cost per kg. of oil seed	Rs. 2.50
Fixed cost per kg. of oil seed	Rs. 5.00
Oil Mill Division :	
Variable cost of processed edible oil	Rs. 10.00 per kg.
Fixed cost of processed edible oil	Rs. 7.50 per kg.
Marketing Division :	
Variable cost per can of 2 kg. of oil	Rs. 3.75
Fixed cost per can of 2 kg of oil	Rs. 8.75

The fixed costs are calculated on the basis of the estimated quantity of 2,000 kg. of oil seeds harvested, 1,000 kg. of processed oil and 500 cans of edible oil packed by the aforesaid divisions respectively during the period under review.

The other oil mills buy the oil seeds of same quality at Rs. 12.50 per kg. in the market. The market price of edible oil processed by the oil mill, if sold without being packed in the marketing division is Rs. 62.50 per kg. of oil.

Required :

- (i) Compute the overall profit of the company of harvesting 2,000 kg. of oil seeds, processing it into edible oil and selling the same in 2 kg. cans as estimated for the period under review.
- (ii) Compute the transfer prices that will be used for internal transfers from (1) Harvesting Division to Oil Mill Division and (2) from Oil Mill Division to Marketing Division under the following pricing methods :
 - (a) Shared contribution in relation to variable costs; and
 - (b) Market price.
- (iii) Which transfer pricing method will each divisional manager prefer to use?

Question 7 :

Fastners Ltd. is having production shops reckoned as cost centres. Each shop charges other shops for material supplied and services rendered.

The shops are motivated through goal setting, autonomy and management efforts. Fastner Limited is having a welding shop and painting shop. The welding shop welds annually 12,000 assemblies.

The assemblies are having total cost of Rs. 9.50 each and are sold in market at Rs. 12 per assembly. Out of the total production, 80% is diverted to painting shop at same price ruling in the market. Welding shop incurs a fixed cost of Rs. 24,000 per annum. The painting shop is having fixed cost of Rs. 30,000 and its variable cost of painting including transfer price from welding shop comes to Rs. 20 per unit. This shop sells all units transferred to it by welding shop at Rs. 25 per assembly.

You are required to :

- Find out profit of individual cost centres and overall profitability of the concern.
- Recommend course of action if painting shop wishes to purchase its full requirement (at market price which is Rs. 10 per assembly) either from open market or from welding shop at market price of Rs.10 per assembly.

Note : Assume that the external demand for welding shop is restricted to only 20% of its production at a selling price of Rs. 12 per unit and no further.

Question 8 :

Division A of Better Margins Ltd. has been given a budgeted target of selling 2,00,000 components COM 21, at a price which would fetch a return of 25% on the average assets employed by it. The following figures are relevant:

Fixed Overhead	Rs. 4,00,000
Variable Cost	Re. 1 per unit
Average assets :	
Debtors	2,00,000
Stocks	6,00,000
Plant and other assets	4,00,000

However, the marketing department of the company finds out by a survey that the Maximum number of COM 21, the market can take, at the proposed price is only 1,40,000 units.

Fortunately Division B is willing to purchase the balance 60,000 units. The manager of division A is willing to sell to Division B at a concessional price of Rs. 4 per unit. But the Manager of division B is ready to pay Rs. 2.25 only per unit, as he feels he can himself make COM 21 in his Division at that price.

Rather than sell to Division B at Rs. 2.25, the manager, Division A feels he will restrict the activity of his Division to the manufacture and sale of 1,40,000 components only. By this, he could reduce Rs. 80,000 in stocks, Rs. 1,20,000 of plant and other assets and Rs. 40,000 in Selling and Administration Expenses.

As a Management Accountant, you are asked to work out the various computations and show that selling 60,000 COM 21 to Division B at Rs. 2.25 per unit would be in the best interest of the organisation to achieve goal congruence.

Question 9 :

A company is organised on decentralised lines, with each manufacturing division operating as a profit centre. Each division manager has full authority to decide on sale of division's output to outsiders and to other divisions.

Division C has always purchased its requirements of a component from Division A. But when informed that Division A was increasing its selling price to Rs. 150, the manager of Division C decided to look at outside suppliers.

Division C can buy the component from an outside supplier for Rs. 135. But Division A refuses to lower its price in view of its need to maintain its return on the investment.

The top management has the following information :

C's annual purchase of the component	1,000 units
A's variable costs per unit	Rs. 120
A's fixed cost per unit	Rs. 20

Required :

- Will the company as a whole benefit, if Division C bought the component at Rs. 135 from an outside supplier?
- If A did not produce the material for C, it could use the facilities for other activities resulting in a cash operating savings of Rs. 18,000. Should C then purchase from outside sources?
- Suppose there is no alternative use of A's facilities and the market price per unit for the component drops further by Rs. 20. Should C now buy from outside?

Goal Congruence with Capacity Restrictions
Question 10 :

City Instrument Company (CIC) consists of the Semi-conductor Division and the Mini-computer Division, each of which operates as an independent profit centre. Semi-conductor Division employs craftsmen, who produce two different electronic components, the new-high performance Super-chip and an older product called Okay-chip. These two products have the following cost characteristics :

Super-chip		
Material	Parts	Rs. 20
Labour	2 Hrs. x Rs.140	Rs. 280
Okay-chip		
Material	Parts	Rs. 10
Labour	1/2 hrs. x Rs.140	Rs. 70

Annual Overheads in Semi-conductor Division is Rs. 40,00,000 all fixed. Owing to high skill level necessary for the craftsmen, the Semi-conductor Division's capacity is set at 50,000 hours per year.

To date, only one customer has developed a product utilising super-chip, and this customer orders a maximum of 15,000 super-chips per year at a price of Rs. 600 per chip. If CIC cannot meet his entire demand, the customer curtails his own production. The rest of the semi-conductor's capacity is devoted to Okay-chips, for which there is unlimited demand at Rs. 120 per chip.

The Mini-computer Division produces only one product, a process control unit, which requires a complex circuit board imported at a price of Rs. 600. The control unit's costs are :

Control Unit		
Material	Circuit board	Rs. 600
	Other parts	80
Labour	5 hours @ Rs. 100	500

The Mini-computer Division is composed of only a small assembly plant and all overhead is fixed at a total of Rs. 8,00,000 per year. The current market price for the control unit is Rs. 1,400 per unit.

A joint research project has just revealed that with minor modifications, a single super-chip could be substituted for the circuit board currently used by the Mini-computer division. The modification would require an extra one hour of labour by Mini-computer's staff, for a total of 6 hours per control unit. Mini-computer has therefore asked Semi-conductor division to declare a transfer price at which Semi-conductor division would sell super-chip internally.

Required :

- Mini-computer expects to sell 5,000 control units this year. From the overall view point of CIC, how many super-chips should be transferred to Mini-computer Division to replace circuit boards?
- If the demand for the control unit is sure to be 5,000 units, but its price is uncertain, what should be the transfer price of super-chip to ensure proper decision? (All other data unchanged)
- If demand for the control unit rises to 12,000 units at a price of Rs. 1,400 per unit, how many of 12,000 units should be built using super-chip? (All other data unchanged.)

Question 11 :

Division Z is a profit centre, which produces four products A, B, C and D. Each product is sold in the external market also. Data for the period is as follows:

Particulars	A	B	C	D
Market Price per unit (Rs.)	150	146	140	130
Variable cost of production per unit (Rs.)	130	100	90	85
Labours Hours required per unit	6	8	4	6

Product D can be transferred to division Y, but the maximum quantity that might be required for transfer is 2,500 units of D.

The maximum sales in the **external market** are :

A	2,800 units
B	2,500 units
C	2,300 units
D	1,600 units

Division Y can purchase the same product at a slightly cheaper price of Rs. 125 per unit instead of receiving transfers of product D from division Z.

What should be the transfer price per unit for 2,500 units of D, if the total labour hours available in division Z are :

- (i) 40,000 hours.
- (ii) 60,000 hours.

Goal Congruence with Demand Restrictions

Question 12 :

A Company has two manufacturing divisions X and Y. X has a capacity of 96,000 hours per annum. It manufactures two products, 'Gear' and 'Engines' as per the following details.

Particulars	Gears	Engines
Direct Materials	240	34
Variable costs at ₹ 64/hour	256	64
Selling price in the outside market	640	128

Division 'Y' produces product 'Wheels' as per the following details:

Particulars	₹/Unit
Imported components	640
Direct Materials	96
Variable cost at ₹ 40 per hour	320
Selling price in the outside market	1,160

The fixed overheads for X and Y are ₹ 24 lakhs and ₹12 lakhs respectively.

With a view to minimizing dependence on the imported component, the company has explored a possibility of Division Y using product 'Gears'; instead of the imported component. This is possible provided Division Y spends an additional expenditure of ₹ 64 per component on modification of product 'Gears' to fit into 'Wheels'.

Production and sales of 'Wheels' in Division Y are limited to 5,000 units per annum.

Required :

- (i) What will be the maximum transfer price per unit that Y will offer?
- (ii) In each of the following independent situations, state with supporting calculations, the minimum transfer price per unit that X will demand from Y, if 5,000 units are required by Y.

Outside Market Demand in units	Gears	Engines
(a) Market demand is limited to	20,000	20,000
(b) Market demand is limited to	15,000	10,000
(c) Market demand is limited to	18,000	24,000

- (iii) In which of the above situations in (ii) above, will the management step in and compel X to sell to Y in the interest of overall company's profits to achieve goal congruence?

Question 13 : [RTP - May 2018]

Mary Ltd. has two divisions Division A and Division B. Division A produces product Z, which it sells to external market and also to Division B. Divisions in the Mary Ltd. are treated as profit centres and divisions are given autonomy to set transfer prices and to choose their supplier. Performance of each division measured on the basis of target profit given for each period.

Division A can produce 1,00,000 units of product Z at full capacity. Demand for product Z in the external market is for 70,000 units only at selling price of ₹ 2,500 per unit. To produce product Z, Division A incurs ₹ 1,600 as variable cost per unit and total fixed overhead of ₹ 4,00,00,000. Division A has employed ₹ 12,00,00,000 as working capital, working capital is financed by cash credit facility provided by its lender bank @ 11.50% p.a. Division A has been given a profit target of ₹ 2,50,00,000 for the year.

Division B has found two other suppliers R Ltd and S Ltd. who have agreed to supply product Z.

Division B has requested a quotation for 40,000 units of product Z from Division A.

Required

- (i) CALCULATE the transfer price per unit of product Z that Division A should quote in order to meet target profit for the year.
- (ii) CALCULATE the two prices Division A would have to quote to Division B, if it became Mary Ltd. policy to quote transfer prices based on opportunity costs.

Solution 13 :

(i) **Approach :** Transfer Price per unit of Product Z that Division A should quote in order to meet target profit, should be such that it meets Division A's target profit and interest cost on working capital. Therefore the minimum quote for 40,000 units of product Z will be calculated as follows :

Particulars	Amount (₹)
Target Profit (given for the year)	2,50,00,000
Add: Interest Cost on Working Capital (12,00,00,000 @11.5%)	1,38,00,000
Required Total Profit	3,88,00,000
Add: Fixed Overhead	4,00,00,000
Target Total Contribution	7,88,00,000
Less: Contribution Earned from External Sales { 60,000 units × (2,500 – 1,600) }	5,40,00,000
Contribution Required from Internal Sales	2,48,00,000
Contribution per unit of Product Z (2,48,00,000 ÷ 40,000 units)	620
Transfer Price of Product Z to Division B [1,600 + 620] (Variable Cost per unit + Contribution per unit)	2,220

(ii) The Two Transfer Prices Based on Opportunity Cost :

- (a) For the 30,000 units (i.e. for surplus capacity) : As there is no opportunity cost, the transfer price shall be variable cost of production i.e. ₹ 1,600 per unit.
- (b) For the next 10,000 units (i.e. for losing external market demand) : As there is an opportunity cost (i.e. contribution lost on external sales), the transfer price shall be variable cost per unit plus opportunity cost per unit = ₹ 1,600 + ₹ 900 = ₹ 2,500 per unit.

Proposals for Resolving Transfer Pricing Conflict

Conflict of interest between individual divisions and the company can also be addressed by following the following systems for transfer pricing:

1. Dual Rate Transfer Pricing System

The supplying division records transfer price by including a normal profit margin (i.e. cost plus) thereby showing reasonable profits. The purchasing division records transfer price at marginal cost thereby recording purchases at minimum cost. This allows for better evaluation of each division's performance. It also improves co-operation between divisions, promoting goal congruence and reduction in under utilisation of resources.

Drawbacks of Dual Pricing include:

- (i) It can complicate the records. As the debit and credit won't match, it may result in errors in the company's overall records.
- (ii) Profits shown by the divisions are artificial and need to be used only for internal evaluations.

2. Two Part Transfer Pricing System

This pricing system is again aimed at resolving problems related to distortions caused by the full cost based transfer price.

Here, transfer price = marginal cost of production + a lump-sum charge (two parts of pricing).

While marginal cost ensures recovery of additional cost of production related to the goods transferred, lump-sum charge enables the recovery of some portion of the fixed cost of the supplying division. Therefore, while the supplying division can show better profitability, the purchasing division can purchase the goods at a lower rate compared to the market price.

Questions on Transfer Pricing Conflicts & Behavioural Consequences

Question 14 : [RTP - Nov. 2018]

Great Vision manufactures a wide range of optical products including lenses and surveillance cameras. Division 'A' manufactures the lenses while Division 'B' manufactures surveillance cameras. The lenses that Division 'A' manufactures is of standard quality that has a number of applications. Due to huge demand in the market for its products, Division 'A' is operating at full capacity. It sells its lenses in the open market for ₹ 140 per lens, the variable cost of production for each lens is ₹ 110, while the total cost of production is ₹ 125 per lens.

The total production cost of a camera by Division 'B' is ₹ 400 each. Currently Division 'B' procures lens from foreign vendors, the cost per lens would be ₹ 170 each. The management of Great vision has proposed that to take advantage of in-house production capabilities and consequently the procurement cost of the lens would reduce. It is proposed that Division 'B' should buy an average of 5,000 lenses each month from Division 'A' at ₹ 120 per lens. The estimated cost of a surveillance camera is as below :

Other components purchased from external vendors	₹ 150
Cost of lens purchased from Division 'A'	₹ 120
Other variable costs	₹ 30
Fixed overheads	₹ 50
Total cost of a camera	₹ 350

Each surveillance camera is sold for ₹ 410. The margin for each camera is low since competition in the market is high. Any increase in the price of a camera would reduce the market share. Therefore, Division 'B' cannot pay Division 'A' beyond ₹ 120 per lens procured.

Great vision's management uses Return on investments (ROI) as a scale to measure the divisional performance and marginal costing approach for decision making.

Required :

- (i) ANALYZE the behavioral consequences of each division when Division 'A' supplies lenses to Division 'B' at ₹ 120 per lens? Substantiate your answer based on the information given in the problem.
- (ii) ANALYZE if it would be beneficial to the company as a whole for Division 'A' to supply the lenses to Division 'B' at ₹ 120 per lens.
- (iii) Do you feel that the divisional managers should accept the inter-divisional transfers in principle? If yes, CALCULATE the range of transfer price?
- (iv) ADVISE alternate transfer pricing models that the chief executive of the company can consider in order to change the attitude of the divisional heads if they are against the transfer pricing policy.
- (v) CALCULATE the range of transfer price, if Division 'A' has excess capacity and can accommodate the internal requirement of 5,000 lens per month within the current operations.

Answer 14 :

(i) Analysis of Behavioral Consequences :

Division 'A' has huge demand for its lenses enabling it to operate at full capacity. External sales yield a contribution of ₹ 30 per lens sold (selling price of ₹ 140 less variable cost of ₹ 110 per lens). Likewise, each sale yields a profit ₹ 15 per lens (selling price of ₹ 140 less total cost of production ₹ 125 per lens). This yields an ROI of 12% (profit of ₹ 15 per lens over a cost investment of ₹ 125 per lens).

If Division 'A' sells lens to Division 'B' at ₹ 120 per lens, its contribution reduces to ₹ 10 per lens (transfer price ₹ 120 less variable cost ₹ 110), while overall it shows a loss of ₹ 5 per lens (transfer price ₹ 120 less total cost of production is ₹ 125 per lens). The loss of ₹ 5 per lens is on account of (i) only partial recovery of fixed cost of production and (ii) opportunity cost in the form of loss of profit from external sales. This would therefore result in lower divisional profit for Division 'A'.

Consequently, the manager of Division 'A' would not accept the transfer price of ₹ 120 per lens. Lower profitability due to internal sales may demotivate the division. Due to the benefits of internal procurement, the management of Great vision may want to increase the capacity of Division 'A' or infuse more investment to expand its operations. However, due to inability to recover fixed costs in its entirety from internal sales, the ROI of the division is impacted, therefore divisional performance would be perceived to be lower. Therefore, it may oppose decisions as this would lead to higher fixed costs. At an overall level, such opposition may be detrimental to the company, leading to sub optimization of resources.

The current total cost of production for Division 'B' is ₹ 400 per camera. Each sale yields a profit of ₹ 10 per camera (Selling price ₹ 410 less total cost of production ₹ 400 per camera). Therefore, the current ROI is 2.50% (profit of ₹ 10 over cost investment of ₹ 400 per camera). If the lens is procured from Division 'A' at ₹ 120 per lens, Division 'B' can get a benefit of ₹ 50 per camera due to lower procurement cost. If lenses are procured from Division 'A', referring to the cost estimate given in the problem, Division 'B' can earn a contribution of ₹ 110 per lens sold (sale price of ₹ 410 per camera less variable cost of ₹ 300 per camera) and a profit of ₹ 60 per camera (sale price of ₹ 410 per camera less total cost of production of ₹ 350 per camera). Therefore, ROI improves to 17.14% (profit of ₹ 60 over cost investment of ₹ 350 per camera). By procuring the lenses internally, the profit of the division 'B' improves substantially. Consequently, the manager of Division 'B' would be happy to accept the transfer price of ₹ 120 per camera.

(ii) Analysis of Overall Benefit to the Company (from internal transfer) :

While calculating the benefit to the company, the fixed cost of each division is ignored. It is also given in the problem, that only marginal cost (variable cost) is considered for decision making.

As explained above, each external sale yields a contribution of ₹ 30 to Division 'A'. The lost contribution each month from diversion of external sales of Division 'A' towards internal transfer to Division 'B' = 5,000 units × ₹ 30 per lens = ₹ 1,50,000 per month. This is an opportunity cost to the company.

The current procurement price for Division 'B' is ₹ 170 per lens. The same lens can be manufactured at ₹ 110 (variable cost) by Division 'A'. Therefore, cost of production reduces by ₹ 60 for the company. Savings in procurement cost = 5,000 units × ₹ 60 per lens = ₹ 300,000 per month. This is a savings to the company.

Therefore, the net benefit to the company on overall basis is

$$= ₹ 3,00,000 - ₹ 1,50,000 = ₹ 150,000 \text{ per month.}$$

(iii) Range of Transfer Price :

As explained above, the company gets a net benefit of ₹ 150,000 per month by procuring the lenses internally. Therefore, the divisional managers should accept the transfer pricing model in principle. At the same time, neither of the division should be at a loss due to this arrangement. When the transfer price is ₹ 120 per lens, Division 'A' bears the loss, which will impact assessment of the division's performance. Therefore, an acceptable range for transfer price should be worked out. This can be done as below:

When the supplying division operates at full capacity, the range for transfer pricing would be-

(a) Minimum transfer price = Marginal cost p.u. + Opportunity cost p.u.

$$= ₹ 110 + ₹ 30 \text{ per lens} = ₹ 140 \text{ per lens.}$$

In other words, the minimum transfer price would be the external sale price of each lens.

(b) Maximum transfer price = Lower of net marginal revenue and the external buying price.

Net marginal revenue per camera

= Marginal revenue – Marginal cost (i.e. variable cost excluding the cost of the lens)

$$= ₹ 410 - ₹ (150 + 30) = ₹ 410 - ₹ 180 = ₹ 230 \text{ per camera.}$$

The current external procurement price is ₹ 170 per lens.

Lower of the above two is ₹ 170 per lens, which is maximum affordable price for the buying division 'B'.

Therefore, the acceptable range for transfer price would be from a minimum of ₹ 140 per lens up to maximum of ₹ 170 per lens. The managers may be given autonomy to negotiate a mutually acceptable transfer price between this range.

(iv) Advise on Alternative to Current Transfer Pricing System :

Other alternative transfer pricing models that can be considered are:

Dual Pricing

The supplying division, Division 'A', records transfer price by including a normal profit margin thereby showing reasonable revenue. At the current market price per lens, transfer price for Division A would be ₹ 140 per lens. The purchasing division, Division 'B', records transfer price at marginal cost thereby recording purchases at minimum cost. As per the current production cost, the transfer price for Division 'B' would be the variable cost incurred by Division

'A' to manufacture one lens, that is ₹ 110 per lens. This allows for better evaluation of each division's performance. It also improves co-operation between divisions, promoting goal congruence and reduction of sub-optimization of resources.

Drawbacks of dual pricing include:

- (a) It can complicate the records, thereby may result in errors in the company's overall records.
- (b) Profits shown by the divisions are artificial and need to be used only for internal evaluations.

Two Part Pricing System

Here, transfer price = marginal cost of production + a lump-sum charge (two part to pricing). While marginal cost ensures recovery of additional cost of production related to the goods transferred, lump-sum charge enables the recovery of some portion of the fixed cost of the supplying division. Therefore, while the supplying division can show better profitability, the purchasing division can purchase the goods at a lower rate compared to the market price.

The proposed transfer price of ₹ 120, is a two-part price that enables Division 'A' to recover the marginal cost of production of a lens as well as portion of the fixed cost. However, as explained in part (i) above, this price is insufficient to provide a reasonable return to Division 'A'. Therefore, the management of Great vision along with the divisional managers have to negotiate a price that is reasonable to Division 'A' while not exceeding the current procurement price of ₹ 170 per lens for Division 'B'. As explained in part (iii) of the solution, in the given case, the range of ₹ 140 to ₹ 170 per lens, would help resolve this conflict.

(v) Range of Transfer Price where Division 'A' has excess capacity :

When the supplying division has excess capacity, the range for transfer pricing would be

- (a) Minimum transfer price (determined by Division 'A') = marginal cost per lens = ₹ 110 per lens. Here, the opportunity cost to division 'A' is NIL. This ensures that the Division 'A' is able to recoup at least its additional outlay of ₹ 110 per lens incurred on account of the transfer. Fixed cost is a sunk cost hence ignored. Since capacity can be utilized further, it would be optimum for Division 'A' to charge only the marginal cost for internal transfer. Division 'B' gets the advantage of getting the goods at a lower cost than market price.
- (b) Maximum transfer price (determined by Division 'B') = Lower of net marginal revenue and the external purchase price. As explained in part (iii) above, this would be lower of net marginal revenue of ₹ 230 per camera or external purchase price of ₹ 170 per lens. Therefore, the maximum transfer price would be ₹ 170.

Hence, when Division 'A' has excess capacity, the minimum transfer price would be ₹ 110 per lens while the maximum transfer price would be ₹ 170 per lens.

Question 15 : [Nov. 2018 Exam]

Usha Products Co., operates a Pulp Division that manufactures Wood Pulp for use in the production of various paper goods. The following informations are available :

Particulars	₹/kg.
Selling price	210
Less : Variable expenses	126
Contribution	84
Less : Fixed expenses (based on a capacity 1,00,000 kgs. p.a.)	54
Net income	30

Usha Products has just acquired a small company that manufactures paper cartons. This company will be treated as a division of Usha with full profit responsibility. The newly formed Carton Division is currently purchasing 10,000 kgs of pulp per year from supplier at a cost of ₹ 210 per kg. less a 10% quantity discount. Usha's President is anxious that the Carton Division begins purchasing its pulp from the Pulp Division if an acceptable transfer price can be worked out.

Required : (Answer any 2 items from situations I, II and III below)

Situation I

If the Pulp Division is in a position to sell all of its pulp to outside customers at the normal price of ₹ 210 per kg, will the Managers of the Carton and Pulp Division agree to transfer 10,000 kgs. of pulp next year at a determined price? Explain with reasons. [5 Marks]

Situation II

Assuming that the Pulp Division is currently selling only 60,000 kgs of pulp each year to outside customers at the stated price of ₹ 210 per kg, will the Managers agree to a mutually acceptable transfer price for 10,000 kgs of pulp next year? Explain with reasons. [5 Marks]

Situation III

If the outside supplier of the Carton Division reduces its price to ₹ 177 per kg, will the Pulp Division meet this price? Explain. If the Pulp Division does not meet the price of ₹ 177 per kg, what will be the effects on profits of the company as a whole? [5 Marks]

Solution 15 :**Situation I :**

The Pulp Division is in a position to sell all its pulp to outside customer at the normal price of ₹ 210 per kg., it would ask the Carton Division to pay for Variable Cost plus Opportunity Cost i.e. the present selling price of ₹ 210 per kg.

Carton Division is presently buying the pulp from outside supplier at 10% discount i.e. $210 - 10\% = ₹ 189$ per kg. This division won't be ready to pay anything more than ₹ 189 per kg.

As can be observed from the above, Pulp Division won't sell below ₹ 210 per kg. and Carton Division won't pay above ₹ 189 per kg.; these divisions won't be able to reach at an agreeable price. Hence, no transfer would take place.

Situation II :

If Pulp Division is selling only 60,000 kg. in the outside market, then it will be left with a surplus capacity of 40,000 kg. For using spare capacity, the incremental cost of manufacture would be only variable cost i.e. ₹ 126 per kg. and no opportunity cost. It means, Pulp Division would be ready to transfer at any price above ₹ 126 per kg. The requirement of Carton Division is only 10,000 kg., which is within the available surplus capacity.

Carton Division is presently buying the pulp from outside supplier at ₹ 189 per kg. and would be ready to buy it at any price below ₹ 189 per kg.

Thus, both the divisional managers would agree to a price between the range of ₹ 126 per kg. to ₹ 189 per kg. In such case, the transfer would take place.

Situation III :

If we assume that Pulp Division has a spare capacity for internal transfer, then it should transfer to Carton Division at a price of ₹ 177 per kg. The incremental cost for Pulp Division is only ₹ 126 per kg. and it will still earn an incremental profit of ₹ 5,10,000 on internal transfer.

Calculation of incremental profit = 10,000 kg. \times (177 - 126) = ₹ 5,10,000.

However, if Pulp Division doesn't have the spare capacity, then it will not transfer the pulp to Carton Division @ ₹ 177 per kg.

Question 16 : Case Study

Rest Easy Company is a rapidly growing start-up in the technology sector. It develops customized ERP packages for clients across various business sectors. The business comprises primarily of two departments (1) Consultant and (2) Customer support. Consultant department has highly qualified professionals from management, accounting and technology background, who approach clients as a team and work out solutions that meet their needs. Customer support personnel are in charge of IT implementation and provide support through telephone, e-mail or on-site. Currently, the strength of the consultants department is 200 while that of customer support is 150.

Yash, the founder and CEO of the company, is very passionate about this business model. To deliver high-quality product solutions, he believes that his staff should be well-trained and up-to-date with developments in their professional fields. Therefore, Rest Easy provides periodic training to its staff in-house. All employees are expected to undergo 2 weeks of training annually. A training department has been set up with qualified trainers in various fields, who provide periodic training sessions to both Consultant and Customer Service departments. The training department has 5 trainers. Training sessions are aimed at providing skills that the executives need to provide better service to their clients. This in-house focus of high-quality delivery, is the key factor that Yash believes would set apart Rest Easy from its competitors.

In addition to delivering training sessions, trainers are responsible for developing training material for routine, on-going as well as specialized training sessions. They attend conferences, train the trainer sessions and subscribe to journals to keep themselves up-to-date with various developments that consultants and customer support executives need to be aware of.

At the beginning of each year, heads of consultant and customer service departments advise the training department on the expected number of training sessions that their staff would undertake. In special situations, where developments need to be communicated rapidly, extra sessions can also be conducted. Training department budgets are prepared based on these needs.

Transfer Pricing - Training Cost Allocation

Cost incurred by the training department is allocated to the consultant and customer service department based on the training sessions availed by both departments. A standard quote (transfer price) based on budgets is provided at the beginning of the year. At the end of the year, actual cost is allocated based on actual training sessions of each department.

Each of the user departments use the transfer price to prepare their individual budgets, that further gets built into their pricing models used for billing clients. One of the metric for manager appraisal is also the financial performance of their individual departments. Hence, managers of both consultant and customer service departments are very cost conscious.

Figures for budget and actual costs for 2017 of the training department are as follows:

Particulars of cost items	Budget	Actual
Salaries	25,00,000	30,00,000
Depreciation on Office Equipment	2,00,000	5,00,000
Software Licenses for Training Packages	80,000	1,05,000
Conference Travel for Train the Trainer Sessions	10,000	15,000
Telephone	20,000	25,000
Training Supplies	50,000	60,000
Trainee Lunch	100,000	120,000
Total Expenses	29,60,000	38,25,000

Consultant and Customer service departments are charged based on the number of training sessions actually availed. Details of training sessions for each department are:

Department	Budget	Actual
Consultant	100	100
Customer Service	100	80
Total	200	180

Problem of Goal Congruence

In accordance with the above explanation, the training department quoted a rate of ₹14,800 per session based on the budgeted cost and budgeted training sessions. (Budgeted cost ₹29,60,000 for 200 training sessions). Actual cost per session is ₹21,250 (Actual cost ₹38,25,000 for 180 training sessions). Cost overrun is ₹6,450 per session, a jump of around 43.58% from the original quote.

Consequently, a meeting was called that was attended by the managers of consultant, customer service and training departments, along with the CEO Yash.

The user departments were unhappy with the higher charge. Manager of the consultant department raised the following concerns:

- The market rate for similar trainings provided by external vendors was only ₹12,000 per session. He has accepted a higher transfer price of ₹14,800 per session only because the in-house training program was more customized towards Rest Easy's end-user-clients.

However, if the department is actually going to be charged ₹ 21,250 per session, he would rather source the training to the outside vendor.

- (b) Further, he pointed out that while his department had adhered to its commitment of 100 training sessions, the customer service department has availed of 20 lesser sessions than its commitment. Reviewing the cost structure of the training department, most of the expenses are fixed in nature. Therefore, when the transfer price is based on the actual cost and actual training sessions, the per session cost has increased because the customer service department did not undergo the entire 100 sessions. He questions, why he should bear a higher allocation of cost due to variance in actual and budgeted usage of training resources of the customer service department?

Manager of the customer service department explained that the variance of 20 training session is on account of the executives handling high-priority work pressure that did not allow them enough time to complete some of the training sessions. At the same time she contended that she should not be charged for those 20 sessions for which no training was availed.

Manager of the training department explained that the ₹5,00,000 cost overrun on salary is due to new hire of a trainer. The trainer's experience is very valuable to the company and hence to get her on board, the company had to offer a higher pay scale. Depreciation on office equipment was higher by ₹3,00,000 due to higher replacement cost of ageing equipment. A specialized software license resulted in an excess spend of ₹25,000. The manager argued that the rest of the expenses were normal increases which were not controllable.

Yash, the CEO, was understandably not happy with the cost over-run. Higher internal transfer price to the end user departments would affect employee morale. However, even though a cheaper option was available from an outside vendor, he could still foresee the value of investing in in-house training programs. Intangible benefits from these customized sessions, would definitely help the company's growth.

To conclude, he was not willing to shut down the training department. At the same time, he had to resolve the dispute resulting from internal transfer pricing in an amicable way. Like profits, teamwork is critical to success.

Required :

- (i) Identify the threats to goal congruence due to internal transfer pricing.
- (ii) During the meeting, an alternate transfer pricing methodology based on two-part pricing system was formulated. Costs would be segregated into fixed and variable categories. A transfer price for each category would be arrived based on budgeted costs and budgeted usage. The standard rate for fixed cost will be applied to the budgeted training sessions and charged to the user departments. The standard rate for variable cost will be applied to the actual training sessions and charged to the user departments. Fixed cost would be defined as those that are not directly impacted by the number of training sessions. Calculate the transfer price to be charged to each department under this method.
- (iii) Evaluate how the two-part pricing method of transfer pricing address the threats to goal congruence as identified in question (i)?

Solution 16 :

(i) Threats to goals congruence due to internal transfer pricing are:

- (a) User groups, consulting and customer service department are concerned that training department is not controlling its costs. Since the entire actual cost gets allocated to the users, training department may not be managing its costs efficiently. Since the financials of user departments are affected, it may lead to conflict between the departments.
 - (b) Yash, the CEO is a firm believer of in-house training and its benefits. However, there are outside vendors that provide similar service at substantially reduced costs. Performance assessment of managers of consulting and customer service are based on their department's financial metrics. Higher internal transfer price for training would affect employee morale since they have no control over these allocated costs. However, their performance is being evaluated based on uncontrollable factors. This could lead to discontent among the managers. Alternatively, Yash may want to reconsider his strategy of in-house training. When suitable, training can be sourced to cheaper options available in the market, without compromising on quality.
 - (c) Most costs of the training department are fixed in nature, as they need to be incurred irrespective of the number of training sessions. These costs are being allocated to the users based on actual training sessions. The budgeted target price is used by the user departments, to determine their billing model to Rest Easy's end user clients. Hence it is important that the budget transfer price is not very different from the actual transfer price charged at the end of the year.
 - (d) In the given problem, internal transfer price has been based on a budget of 200 sessions. Here the customer service department does not adhere to its commitment of 100 training sessions, training sessions actually availed are only 80. Since costs are mostly fixed in nature, the actual cost per training session increases. This is then charged out to the consultant and customer service departments. Consequently, despite meeting its commitment, the consultant department bears a higher cost allocation due to variance in the usage of training resources. This can lead to friction between the user departments.
- (ii) By segregating the costs into fixed and variable components, Rest Easy is working out two part pricing system for transfer price.

Two-Part Pricing System = Lump-Sum Charge + Marginal Cost

To segregate the costs into fixed and variable categories, the criteria is whether the costs change per additional training session. Accordingly, the classification of budgeted costs will be as below:

Cost Particulars	Fixed (₹)	Variable (₹)
Salaries	25,00,000	
Depreciation on Office Equipment	2,00,000	
Software Licenses for Training Packages	80,000	
Conference Travel for Train the Trainer Sessions	10,000	
Telephone	20,000	
Training Supplies		50,000
Trainee Lunch		100,000
Total Expenses	28,10,000	1,50,000

The lump-sum charge would be based on the fixed cost budget. Marginal cost would be based on the variable cost budget.

Total budgeted fixed expenses = ₹ 28,10,000 and total budget variable expenses = ₹150,000. Number of training sessions are 200, that is 100 each for consultant and customer service departments. Hence the fixed cost allocation rate would be ₹14,050 per session and variable cost allocation rate is ₹750 per session.

Transfer price to the consulting department = lump-sum charge + marginal cost

$$\begin{aligned}
 &= (\text{Standard Fixed Cost per session} \times \text{Budgeted Training Sessions}) + \\
 &\quad (\text{Standard Variable Cost per Session} \times \text{Actual Training Sessions}) \\
 &= (\text{₹ } 14,050 \times 100) + (\text{₹ } 750 \times 100) \\
 &= \text{₹ } 14,05,000 + 75,000 = \text{₹ } 14,80,000.
 \end{aligned}$$

Transfer price to the customer service department = lump-sum charge + marginal cost

$$\begin{aligned}
 &= (\text{Standard Fixed Cost per session} \times \text{Budgeted Training Sessions}) + \\
 &\quad (\text{Standard Variable Cost per session} \times \text{Actual Training Sessions}) \\
 &= (\text{₹ } 14,050 \times 100) + (\text{₹ } 750 \times 80) \\
 &= \text{₹ } 14,05,000 + \text{₹ } 60,000 = \text{₹ } 14,65,000.
 \end{aligned}$$

Total transfer price allocation is ₹ 29,45,000 versus actual expenses of ₹ 38,25,000. Unallocated expenses are ₹ 8,80,000.

- (iii) Evaluate how the two-part transfer pricing model would address the goal congruence issues listed in question 1?
- Since transfer prices are based on budgets, the training department would become more cost-conscious. As explained above, as per this transfer pricing method, unallocated expenses of ₹ 8,80,000 would have to be borne by the training department. As given in the problem, this variance is mainly on account of extra cost for the newly hired trainer and the higher depreciation expense. The department will be more cautious while taking future decisions. However, Yash the CEO must ensure that the quality of training is not compromised and remains in line with the company's strategic policy.
 - Internal transfer price of ₹14,800 per session is still higher than the outside rate of ₹12,000 per session. Further decisions would be based on the company's strategic objective. At the same time, if the number of training sessions are expected to increase beyond the budget, this transfer pricing method charges the user department only a marginal cost of ₹750 per session. This is definitely lower than the external rate.
 - Under this method, fixed expenses that form majority of the cost are allocated based on budgeted cost and budgeted usage. Variable expenses are allocated based on actual training sessions. Hence, any variance in the utilization of training resources, does not impact the other user department.

Therefore, most of the goal congruence issues can be addressed through this methodology.

Question 17 : [May 2018 Exam]

GL Ltd. is a multiproduct manufacturing concern functioning with four divisions. The Electrical Division of the company is producing many electrical products including electrical switches. This division is functioning at its maximum capacity, sells its switches in the open market at ₹ 25 each. The variable cost per switch to the division is ₹ 16.

The Household Division, another division of GL Ltd., functioning at 70% capacity asked the Electrical Division to supply 5,000 switches per month at the rate of ₹ 18 each to fit in night lamps produced by it. The total cost per night lamp is being estimated as detailed below:

Particulars	₹
Components purchased from outside suppliers	50.00
Switch if purchased internally	18.00
Other variable costs	40.00
Fixed overheads	21.00
Total cost per night lamp	129.00

The Household Division is marketing night lamps at a price of ₹ 130 each, with a very small margin, as it is doing business in a very competitive environment. Any increase in price made by the division will push out the division from the market. Therefore, the division cannot pay anything more to switches if they are supplied by the Electrical Division.

Further, the manager of the division informed that it is very much essential to keep on the market share for night lamps by the Household Division to retain the experienced workers of the division. The company is using return on investments (ROI) as a scale to measure the divisional performances and also marginal costing approach for decision making.

Required :

- Would you recommend the supply of switches to Household Division by Electrical Division at a price of ₹ 18 each? Substantiate your recommendation with reasons. **(5 Marks)**
- Analyze whether it would be beneficial to the company as a whole the supply of switches to Household Division at a unit price of ₹ 18 by Electrical Division. **(6 Marks)**
- Do you feel that the Divisional Managers should accept the inter-divisional transfers in principle? If yes, what should be the range of transfer price? **(5 Marks)**
- Suggest the steps to be taken by the chief executive of the company to change the attitude of divisional heads if they are against the inter-divisional transfers. **(4 Marks)**

Solution 17 :

- Electrical division won't be willing to supply at ₹ 18, because it has no surplus capacity left and it can sell these switches in the outside market at a much higher price of ₹ 25. If Electrical division supply to Household division, then it will lose ₹ 7 per unit (i.e. 25 - 18).

The performance of each division is measured using ROI. Transfer below ₹ 25, will lead to reduction in ROI and the performance of Electrical Division will be adversely affected. Hence, it is not recommended to transfer the switches @ ₹ 18 each.

- From the overall point of view of the company, it is beneficial to internally supply the switches @ ₹ 18 to Household division. Company will earn a contribution of ₹ 24 on sale of night lamp (as per calculation below) as against a contribution of ₹ 9 (i.e. 25 - 16) on sale of switches. Internal transfer would lead to goal congruence.

Fixed overheads charged to each night lamp is an unavoidable cost and hence irrelevant for decision making. Hence ignored.

Contribution per unit on sale of night lamp :

Particulars	₹
Sales price per unit	130.00
<u>Less : Variable cost per unit -</u>	
Components purchased from outside suppliers	50.00
Variable cost of switch to the company	16.00
Other variable costs	40.00
Contribution per unit on night lamp	24.00

- (iii) In the context of goal congruence, divisional managers should accept the inter-divisional transfers in principle. It will also save Household division from going out of the market. The company will be earning an incremental contribution of ₹ 15 per unit on sale of night lamp (i.e. 24 - 9).

The acceptable range of transfer price shall be minimum price required by Electrical division and maximum affordable price for Household division.

The minimum price to be demanded by Electrical division is Variable cost + Opportunity Cost (if any) i.e. External selling price ₹ 25.

The maximum affordable price for Household division is the lower of (a) External purchase price, which is not available and (b) Net incremental revenue (i.e. 130 - 50 - 40). Which comes to ₹ 40.

Hence, the transfer price should be between ₹ 25 to ₹ 40.

- (iv) As the performance of both the divisions are measured using ROI, the supplying division will not be ready to transfer at marginal cost and the purchasing division will not be ready to buy at market price. To resolve the above conflict, the following methods of transfer pricing are suggested :

1. Dual Rate Transfer Pricing System

The supplying division records transfer price by including a normal profit margin (i.e. cost plus) thereby showing reasonable profits. The purchasing division records transfer price at marginal cost thereby recording purchases at minimum cost. This allows for better evaluation of each division's performance. It also improves co-operation between divisions, promoting goal congruence and reduction in under utilisation of resources.

2. Two Part Transfer Pricing System

This pricing system is again aimed at resolving problems related to distortions caused by the full cost based transfer price.

Here, transfer price = marginal cost of production + a lump-sum charge (two parts of pricing).

While marginal cost ensures recovery of additional cost of production related to the goods transferred, lump-sum charge enables the recovery of some portion of the fixed cost of the supplying division. Therefore, while the supplying division can show better profitability, the purchasing division can purchase the goods at a lower rate compared to the market price.

International Transfer Pricing

Dynamic business models enable business to spread their business across countries. In the recent decades, with the acceptance of a globalized environment, benefits of such business models are being enjoyed across countries. Organisations have benefitted from a multi-national business model. For multinationals considerations for such business models are driven by many factors like :

- Demand for its final products
- Availability of raw materials in a specific country. To source such inputs, multi-national companies can have business set-up in the foreign country. Example - DeBeers Group that sources diamonds from across the world or from India.
- Availability of low-cost labor with specialized skills. India has been one of the major beneficiaries of this outsourcing model.

It can be observed that transactions between divisions of these multi-national companies could involve transfer of goods, provision of services or even for intangibles for use of patents, copyrights, brands in the form of royalty payments. McDonalds, Dominos, Subway, Visa Card etc. charge the brand fees from their franchisee in various countries.

In few cases, there could be inter-company loans to take advantage of excess funds lying with a company in one country, for meeting the needs of a company in another country.

Taxation, profit repatriation and transfer prices are critical considerations to the senior management of the multi-national companies. Multi-national organizations try to maximize profits by using transfer pricing as a tool to reduce the tax impact on earnings. If the supplying division is in a country with higher tax rate, the transfer price will be set lower in-order to book lower profits and pay lower tax. Similarly, the purchasing division, which has a lower tax rate, will get the goods at lower price and book higher profits. Likewise, supply from lower tax rate countries may be priced higher, to report higher profits and thereby reducing the tax impact.

As explained in the beginning of the chapter, from a taxation perspective, transfer price is analyzed as to whether it is at an "arms-length" price. However, what is "arms-length" is a subjective question. This question leads to transfer pricing related disputes between the company and tax authorities. Indian Income Tax Department has recently issued notices to many MNC's in such cases. For example – Vodafone, Nokia, Vedanta Resources etc. to name a few.

A recent case in point is the ruling on Starbucks UK subsidiary by the British authorities. The company is known for their world famous coffee, that generate high margins for the company. Although management claimed that business was good, the tax records reported losses. Investigations revealed that the UK subsidiary paid its Netherlands unit 6% of sales as royalty for intellectual property such as its brand and business processes. This agreement "6% of sale" is the transfer price between the units. The question tax authorities raised was whether this was at arm's-length? Is it comparable with market terms for similar transactions?

In India such tax avoidance measures are being regulated by the government with the introduction of Section 92A to 92F in the Income Tax Act, 1961. This concept is covered in further detail in your taxation syllabus.

International Transfer Pricing and Currency Management

International firms are exposed to exchange rate fluctuation risks. These fluctuations create uncertainty in cash flows and can also misrepresent performance of subsidiaries. With interdivisional trading between subsidiaries in different countries, when one subsidiary makes a loss on a contrary exchange rate movement, the other will make a profit.

The company as a whole should manage its exposures to currency risks. The management of currency risk is the responsibility of either the profit centre managers or a treasury department. A multinational company may set transfer price in a currency, such that any exchange rate fluctuation loss arises in the subsidiary which is in the high tax country. And exchange rate fluctuation profits arise in the country with the lower tax rate. It is possible only when one can fairly judge about the exchange rate movement in the future.

Question 18 :

Mr. Jacob is the CFO of a multinational company having its head office at Canada. The company has an Indian subsidiary having its office at New Delhi. The company manufactures some critical components of computer hardware system at Canada. The cost of manufacture is Rs. 8,000 per unit and it can be sold in India at Rs. 12,000 per unit. The income tax rate in Canada is 10% and in India is 30%.

The Indian law does not allow a foreign company to transfer goods below cost.

You have to help Mr. Jacob in deciding the transfer price of critical component to India, in such a manner that the tax liability of the company is minimised.

Your analysis should be restricted to only three options for transfer price :

i.e. (a) Rs. 8,000 (b) Rs. 10,000 and (c) Rs. 12,000

Question 19 : [ICAI Module]

A car manufacturing company has two manufacturing divisions in different countries. Division A in India manufactures engines for the cars. It has a capacity to manufacture 10,000 units each year. The variable cost of production is ₹ 8,000 p.u. and the division can sell 8,000 engines externally to customers within India at ₹ 11,000 p.u.

The other division, Division B is in Italy. It requires 5,000 engines every year to assemble them further into cars. It purchases these engines from a vendor in Italy at a price that is equivalent to ₹ 9,000 p.u.

If Division B were to purchase these units from Division A of India, the transfer price would be ₹ 10,000 p.u. Since no selling expenses need to be incurred on internal sales, variable cost of such transfers would be ₹ 7,000 p.u. for division A.

If Division A accepts the internal order from Division B, it will have to curtail some of its external sales.

Given that the tax rate is 30% in India and 40% in Italy. Determine whether the company as a whole will benefit if Division B purchases from Division A.

Question 20 : [ICAI Module]

Standard Corporation Inc. (SCI) is a US based multinational company engaged in manufacturing and marketing of Printers and Scanners. It has subsidiaries spreading across the world which either manufactures or sales Printers and Scanners using the brand name of SCI.

The Indian subsidiary of the SCI buys an important component for the Printers and Scanners from the Chinese subsidiary of the same MNC group. The Indian subsidiary buys 1,50,000 units of components per annum from the Chinese subsidiary at CNY (¥) 30 per unit and pays a total custom duty of 29.5% of value of the components purchased.

A Japanese company which manufactures the same component which is used in the Printer and Scanners of SCI, has a manufacturing unit in India and is ready to supply the same component to the Indian subsidiary of SCI at ₹ 320 per unit.

The SCI is examining the proposal of the Japanese manufacturer and asked its Chinese subsidiary to presents its views on this issue. The Chinese subsidiary of the SCI has informed that it will be able to sell 1,20,000 units of the components to the local Chinese manufactures at the same price i.e. ¥ 30 per unit but it will have to incur inland taxes @ 10% on sales value. Variable cost per unit of manufacturing the component is ¥ 20 per unit. The Fixed Costs of the subsidiaries will remain unchanged.

The Corporation tax rates and currency exchange rates are as follows:

Country	Corporate Tax Rate	Foreign Exchange Rate
China	25%	1 US Dollar (\$) = ₹ 61.50
India	34%	1 US Dollar (\$) = ₹ 6.25
USA	40%	1 CNY (¥) = ₹ 9.80

Required :

- Prepare a financial appraisal for the impact of the proposal by the Japanese manufacturer to supply components for Printers and Scanners to Indian subsidiary of SCI. Present your solution in Indian Currency.
- Identify other issues that would be considered by the SCI in relation to this proposal.

(Note: While doing this problem use the information provided in the problem only. Ignore the actual taxation rules or treaties which prevail in the above mentioned countries.)

Solution 20 :

Part (i) to be solved in the classroom and

Part (ii) answer is given below :

The SCI need to consider various other issues before reaching at a final decision of accepting the proposal of the Japanese manufacturer in India. The few suggestive issues that should be considered are as follows:

- The longevity of the proposal of the Japanese manufacturer: Whether Japanese manufacturer will supply the components in the future also. For this purpose a long term agreement between the Indian Subsidiary of SCI and Japanese manufacturer in India needs to be entered.
- Certainty of the fiscal policy in India: The Japanese manufacturer will not be able to supply the component at the present price if the fiscal policy of India will change in the future.
- Repatriation of Profit earned in India: Though the Indian subsidiary is making profit but it depends on the Government policy on the repatriation of profit from India to USA.
- Operating Conditions in China: The SCI has to make sure that the Chinese subsidiary is operating profitably and able to use the spare capacity in the future as well.
- The fiscal policy in China: If the Government of China liberalize its fiscal policies of China in future then the manufacturing cost will be cheaper than the today's cost.

Apart from above suggestive points the foreign relations and other tax treaties should also be kept in consideration.

Question 21 : [ICAI Module]

ABC miners operates two divisions, one in Japan and other in United Kingdom (UK). Mining Division is operated in Japan which is rich in raw emerald.

The other division is United Kingdom Processing Division. It processes the raw emerald into polished stone fit for human wearing.

The cost details of these divisions are as follows:

Division	Japan Mining Division	United Kingdom Processing Division
	Per carat of raw emerald	Per carat of polished emerald
Variable Cost	2,500 Yen	150 Pound
Fixed Cost	5,000 Yen	350 Pound

Several polishing companies in Japan buy raw emerald from other local Mining Companies at 9,000 Yen per carat. Current Foreign Exchange Rate is 50 Yen = 1 Pound. Income Tax rates are 20% and 30% in Japan and the United Kingdom respectively.

It takes 2 carats of Raw Yellow emerald to yield 1 carat of Polished Stone. Polished emerald sell for 3,000 Pounds per carat.

Required :

- (i) COMPUTE the transfer price for 1 carat of raw emerald transferred from Mining Division to the Processing Division under two methods –
 - (a) 200% of Full Costs and
 - (b) Market Price.
- (ii) 1,000 carats of raw emerald are mined by the Japan Mining Division and then processed and sold by the UK Processing Division. COMPUTE the after tax operating income for each division under both the Transfer Pricing Methods stated above in (i) above.

Solution 21 :

- (i) Transfer Price : 200% of Full Cost Basis
 = 200% of (¥ 2,500 + ¥ 5,000)
 = ¥ 15,000 or £ 300 (¥ 15,000/50)

Transfer Price : Market Price Basis
 = ¥ 9,000 or £ 180 (¥ 9,000/50)

(ii) Statement Showing Operating Income :

Particulars	Japan Mining Division		UK Processing Division	
	Transfer Price		Transfer Price	
	¥ 15,000	¥ 9,000	£ 300	£ 180
Selling Price (Polished)	---	---	£3,000	£3,000
Transfer price (raw emerald)	¥ 15,000	¥ 9,000	---	---
Cost of raw emerald	---	---	£600 (£300 x 2)	£360 (£180 x 2)
Variable Cost	¥ 2,500	¥ 2,500	£150	£150
Fixed Cost	¥ 5,000	¥ 5,000	£350	£350
Profit before tax	¥ 7,500	¥ 1,500	£1,900	£2,140
Less : Tax 20% or 30%	¥ 1,500	¥ 300	£570	£642
Profit after tax per carat	¥ 6,000	¥ 1,200	£1,330	£1,498
(x) Output Qty. (carats)	1,000	1,000	500	500
Total Profit (home currency)	¥ 60,00,000	¥ 12,00,000	£6,65,000	£7,49,000
Total Profit (in £) [Yen/50]	£1,20,000	£24,000	£6,65,000	£7,49,000

10

STRATEGIC ANALYSIS OF OPERATING INCOME (ABC)

Activity Based Costing (ABC)

Introduction :

The activity-based costing (ABC) is an alternative method of overhead absorption. Here, costs are grouped according to activities instead of cost centres. These costs are then charged using cost drivers, which drives the cost of an activity. A link is established between activities and products by assigning costs of activities to product(s) based on an individual products' demand for each activity. Costs are grouped into pools according to the activities which drive them. A cost pool of procurement of goods, for example, would include all costs associated with procurement, namely, ordering, inspection, storing and so on and cost driver identified. The acquisition cost is then calculated as cost per cost driver and then charged to the cost objects (i.e. goods & services).

The ABC is a more refined costing system and reports cost numbers that better measure the way the cost objects differently use resources of the company. It also points to opportunities for cost reduction. The cost reduction targets can be set that relate to reduction in the costs per driver unit of each activity area. It ensures that cost accounting information is not merely a by-product of external financial reporting/ accounting system. While it provides a more accurate basis for computing product costs, its greatest benefit is that it is a mechanism for managing costs. It has the greatest potential in area of cost management and resource planning rather than product costing. We will discuss it under Activity Based Management (ABM)

How the traditional absorption costing works

The traditional absorption system for overheads involves the following procedure :

- Step 1 : Collection of Overhead Costs.
- Step 2 : Classification of Overhead Costs into Fixed and Variable for decision-making purposes.
- Step 3 : Allocation of specific costs to particular Cost Centres.
- Step 4 : Apportionment of common costs to various cost centres on appropriate basis e.g. Rent based on area.
- Step 5 : Re-apportionment of Service Cost Centre expenses to Production Cost Centres.
- Step 6 : Computation of Overhead Recovery Rate based on Labour Hours or Machine Hours.

Disadvantages of Traditional absorption Costing

- a. This method attributes costs to Cost Centres. However, costs are influenced by a particular factor (called Cost Driver). They are not influenced by Cost Centres. Even within a cost centre, different heads of cost items can be influenced by different factors and behave in different ways.
- b. This method seeks to measure the cost per unit of time, instead of cost per unit of the product.
- c. This method uses a denominator that may be defective. These rates assumes that products, which take longer time involve more overheads.
- d. This method does not facilitate easy identification of idle capacity costs or abnormal overhead costs.

ABC or Activity Based Costing System has been devised to overcome the above disadvantages.

Cost Object and Cost Driver

Cost Object : It is an item for which cost measurement is required, e.g. a product, a job, a batch, a contract or a customer.

Cost Driver : It is the factor that causes a change in the cost of an activity. Cost Drivers are classified into :

- a. **Resource Cost Driver** : It is a measure of the quantity of resources consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool.
- b. **Activity Cost Driver** : It is a measure of the frequency and intensity of demand, placed on activity by cost objects. This is used to assign activity costs to cost objects.

Examples of Cost Drivers :

Functions	Cost Drivers
Research and Development	<ul style="list-style-type: none"> • Number of research projects • Personnel hours on a project • Technical complexities of projects
Customer Service	<ul style="list-style-type: none"> • Number of service calls • Number of products serviced • Hours spent on servicing products
Design of products, services and processes	<ul style="list-style-type: none"> • Number of products in design • Number of parts per product • Number of engineering hours
Marketing	<ul style="list-style-type: none"> • Number of Advertisements / insertions • Number of sales personnel • Sales revenue
Distribution	<ul style="list-style-type: none"> • Number of items distributed • Number of customers • Weight of items distributed

How Activity Based Costing Works :

The various steps involved in computation of ABC Absorption rates are :

Step 1 : Identify the various Activities within the organisation.

Step 2 : Relate the Overheads to the Activities using Resource Cost Drivers.

- a. Overheads will be related to Support and Primary Activities.
- b. For this purpose, Resource Cost Drivers, (the quantity of resources used by an activity) will be used.
- c. All costs will be identified under the activities, thus creating Activity Cost Pools / Cost Buckets.

Step 3 : Apportion the costs of Support Activities over the Primary Activities on suitable basis.

- a. This is very much like reapportionment of service department expenses to production departments.
- b. Costs of support activities are spread over to primary activities to group costs only under primary activities.

- c. The base is the cost driver which is the measure of how the support activities are used.

Step 4 : Determine the Activity Cost Drivers for each Activity / Cost Pool.

- Activity cost drivers used to relate the overheads collected in the cost pools to cost objects (products) should be determined.
- This is based on the factor that drives the consumption of the activity, i.e. the answer to the question : What causes the activity to incur costs ?
- For example, in production scheduling, the driver will be the number of batches ordered.

Step 5 :

$$\text{Calculate Activity Cost Driver Rate} = \frac{\text{Total Cost of Activity (Cost Pool)}}{\text{Activity Cost Driver}}$$

- Activity Cost Driver Rates are computed for each activity, just like overhead absorption rates.
- The rates will be multiplied by the different cost drivers of each activity that each product / other cost object consumes, so as to ascertain its cost.
- This rate can be used :
 - To ascertain cost of products, (as in traditional absorption costing)
 - To ascertain cost of other cost objects such as customers / customer segments and distribution channels.

Identification of activities for Activity Based costing

The first step in ABC is to identify various activities in the organisation.

Meaning of Activities : Activities comprise of units of work or tasks. For example, purchase of materials is an activity consisting a series of tasks like purchase requisition, advertisement, inviting quotations, identification of suppliers, placement of purchase order, follow-up etc.

Types of Activities : Activities basically fall into four different categories, known as the manufacturing cost hierarchy. These categories were first identified by Cooper in 1990 and help to determine the type of activity cost driver required.

The broad categories are :

Types of Activity	Examples
Unit level activities : These are activities for which the consumption of resources can be identified with the number of units produced. The costs of some activities (mainly primary activities) are strongly correlated to the number of units produced.	<ul style="list-style-type: none"> Use of indirect materials / consumable. Inspection or Testing.
Batch level activities : The costing of some activities (mainly manufacturing support activities) are driven by the number of batches of units produced. These are activities related to setting up of a batch or a production run. The costs of such activities vary with the number of batches made, but is fixed for all units within the batch.	<ul style="list-style-type: none"> Material ordering-where an order is placed for every batch of production. Machine set-up cost-where machines need resetting between each different batch of production. Inspection of Products where the first item in every batch is inspected.

Product level activities : The costs of some activities (often only once activities) are driven by the creation of a new product line and its maintenance. These are activities performed to support different products in the product line.	<ul style="list-style-type: none"> • Designing the product • Producing parts specifications and keeping technical drawings of products up-to-date. • Advertising of individual products rather than company's name.
Facility level activities : These are activities necessary for sustaining the manufacturing process and cannot be directly attributed to individual products.	<ul style="list-style-type: none"> • Ground Maintenance, Factory Rent • Plant Security • Production Manager's Salary

Choice of Activities for ABC : While the number of departments or cost centres can be smaller, activities can be numerous. Hence, all activities are not considered for ABC purposes. The final choice of activities depends on the following factors :

- Cost of that activity should be significant enough to justify separate treatment.
- The activity should be driven (influenced) by a single cost driver. For example, material procurement cost may be driven by the number of purchase orders. However, issuing materials is not driven by the same driver and should be separately identified.

Distinction between Traditional Absorption Costing and ABC :

	Traditional Absorption Costing		Activity Based Costing
a.	Overheads are first related to departments / cost centres (Production and Service Cost Centres)	a.	Overheads are first related to activities or grouped into Cost Pools.
b.	Only two types of activities viz. Unit level Activities and Facility Level Activities are identified.	b.	All levels of activities in the manufacturing cost hierarchy viz. Unit level, Batch Level, Product Level and Facility Level, are identified.
c.	This method relates overheads to cost centres i.e. locations. It is not realistic of the behaviour of costs.	c.	This method relates overheads to the cost driver. Thus, it is more realistic of cost behaviour.
d.	Overhead Rates can be used to ascertain cost of products only.	d.	Activity Cost Driver Rates can be used to ascertain cost of products and also cost of other cost objects such as customer / customer segments, distribution channels etc.
e.	The calculated cost of the cost object is more an approximation.	e.	The calculated cost of the cost object is more accurate & reliable.
f.	Cost of maintaining the system is low, accounting is simple.	f.	Cost of implementing ABC is higher and accounting procedure shall be more complex.

Need of ABC in Manufacturing Organisations.

Manufacturing organisations need ABC for product costing where :

- a. Production overheads are high in relation to direct costs.
- b. There is a great diversity in the product range.
- c. Products use different amounts of overhead resources.
- d. Consumption of overhead resources is not primarily driven by volume.

Purpose and benefits of ABC

- a. To link the cost to its causal factor – i.e. the Cost Driver
- b. To identify costs of activities rather than cost centres
- c. To ascertain product costs with greater accuracy by relating overheads to activities
- d. To overcome the inherent limitations of traditional absorption costing and use of blanket overhead rates.

Steps involved in the installation of an Activity Based Costing System.

1. **Specification of Objectives** : The motives for pursuing an ABC system must be established at the outset. Generally, the objectives are :
 - To improve product costing where there is a belief that existing methods under cost some products and over cost others; or
 - To identify non-value adding activities in the production process which might be a suitable focus for attention or elimination.
2. **Identification of costs for ABC** : Direct costs, like materials and direct labour, are easily assigned directly to products. Some indirect costs that are product-specific (e.g. specific advertising, dealer's commission), may be directly assigned to the product. Hence the remaining indirect costs forms the focus of ABC. Such costs are indirectly assigned to the cost object (i.e. product) via cost Pools and Activity Drivers.
3. **Process specification** : This involves identification of different stages of the production process, the commitment of resources to each process, processing times and bottlenecks. This provides a list of transactions which may, or may not, be defined as 'activities' at a subsequent stage.
4. **Activity definition** : The list of transactions as identified in the previous stage is analysed to ensure aggregation or grouping of common activities and elimination of immaterial activities. Activities are categorized into Primary Activities and Support Activities. The resultant cost pools will likely have a number of different events, or drivers, associated with their incurrence.
5. **Activity driver selection** : Activity cost drivers used to relate the overheads collected in cost pools to cost objects (products) should be determined. This is based on the factor that drives the consumption of activity, i.e. the answer to the question : What causes the activity to incur costs? Generally as single Driver is selected for every activity even though multiple and interrelated activity drivers may exist.
6. **Costing** : A single representative activity driver can be used to assign costs from the activity pools to the cost objects. Such linking of Costs to Cost Objects is generally based on the activity cost driver rate.

7. **Staff Training** : The co-operation of the workforce is essential for successful implementation of ABC. Staff training should be oriented to create an awareness of the purpose of ABC. The need for staff co-operation in the concerted team effort, for mutual benefit, must be emphasized throughout the training activity.
8. **Review and Follow-up** : The actual operation of the ABC system should be closely monitored, Periodic Review and Follow-up action is necessary for successful implementation of the system.

Practical Questions on Activity Based Costing

PROBLEM NO. 1 :

A company produces three products A, B & C for which the standard costs and quantities per unit are as follows :

Products	A	B	C
Quantity produced	10,000	20,000	30,000
Direct material p.u. (Rs.)	50	40	30
Direct labour p.u. (Rs.)	30	40	50
Labour hours p.u.	3	4	5
Machine hours p.u.	4	4	7
No. of purchase requisitions	1,200	1,800	2,000
No. of set ups	240	260	300

Production overhead split by departments :

Department 1	= Rs. 11,00,000
Department 2	= Rs. 15,00,000
Department 1 is labour intensive and department 2 is machine intensive.	
Total labour hours in Dept. 1	= 2,60,000
Total machine hours in Dept. 2	= 3,30,000

Production overhead split by activity :

- Receiving / inspecting	Rs.14,00,000
- Production scheduling / machine set up	Rs.12,00,000
Number of batches received / inspected	= 5,000
Number of batches for scheduling and set-up	= 800

You are required to :

- Prepare product Cost statement under traditional absorption costing and Activity Based costing method.
- Compare the results under two methods.

PROBLEM NO. 2 :

The following information provides details of costs, volume & cost drivers for a particular period in respect of ABC Ltd. for products X, Y, and Z.

	Particulars	X	Y	Z	Total
1	Production & Sales (units)	30,000	20,000	8,000	
2	Raw material types (nos./batch)	5	5	11	
3	Direct material cost (Rs./unit)	25	20	11	12,38,000
4	Direct labour hours (hours/unit)	1.3333	2	1	88,000
5	Machine hours (hours/unit)	1.3333	1	2	76,000
6	Direct labour cost (Rs./unit)	8	12	6	
7	Number of production runs	3	7	20	30
8	Number of deliveries	9	3	20	32
9	Number of receipts (2 x 7)*	15	35	220	270
10	Number of production orders	15	10	25	50

* The company operates a just-in-time inventory policy, and receives each component once per production run.

Overheads costs :	(₹)
Set-up	30,000
Machines	7,60,000
Receiving	4,35,000
Packing	2,50,000
Engineering	3,73,000
Total overheads cost	18,48,000

In the past the company has allocated overheads to products on the basis of direct labour hours. However, the majority of overheads are related to machine hours rather than direct labour hours. The company has recently redesigned its cost system by recovering overheads using two volume related bases: machine hours and a materials handling overhead rate for recovering overheads of the receiving department.

Both the current and the previous cost system reported low profit margins for product X, which is the company's highest-selling product. The management accountant has recently attended a conference on activity-based costing, and the overhead costs for the last period have been analysed by the major activities in order to compute activity based costs.

From the above information you are required to:

- (a) Compute the product costs using a traditional volume-related costing system on the assumption that :
 - (i) all overheads are recovered on the basis of direct labour hours (i.e. the company's past product costing system);
 - (ii) the overheads of the receiving department are recovered by calculating a % of material cost and the remaining overheads are recovered using a machine hour rate (i.e. the company current costing system).
- (b) Compute product costs using an activity-based costing system.

PROBLEM NO. 3 :

A company manufactures several products of varying levels of designs and models. It uses a single overhead recovery rate based on direct labour hours. The overheads incurred by the company in the first half of the year are as under :

Particulars	(₹)
Machine operation expenses	10,12,500
Machine maintenance expenses	1,87,500
Salaries of technical staff	6,37,500
Wages and Salaries of Stores Staff	2,62,500

During this period, the company introduced activity based costing system and the following significant activities were identified :

- receiving materials and components
- set up of machines for production runs
- quality inspection

It is also determined that :

- The machine operation and machine maintenance expenses should be apportioned between stores and production activity in 20 : 80 ratio.
- The technical staff salaries should be apportioned between machine maintenance, set up and quality inspection in 30 : 40 : 30 ratio.

The consumption of activities during the period under review are as under :

- Direct labour hours worked 40,000
- Direct wage rate Rs. 6 per hour
- Production set-ups 2,040
- Material and component consignments received from suppliers 1,960
- Number of quality inspections carried out 1,280

The data relating to two products manufactured by the company during the period is as under:

Products	P	Q
Direct Material Costs (Rs.)	6,000	4,000
Direct labour hours	960	100
Direct material consignments received	48	52
Production runs	36	24
Number of quality inspections done	30	10
Quantity produced (units)	15,000	5,000

A potential customer has approached the company for the supply of 24,000 units of a component K to be delivered in lots of 3,000 units per quarter. The job will involve an initial design cost of Rs. 60,000 and the manufacture will involve the following per quarter :

Direct material costs	Rs. 12,000
Direct labour hours	300
Production runs	6
Inspections	24
Number of consignments of direct materials to be received	20
The company desires a markup of	25% on cost

Required :

- Calculate the cost of products P and Q based on existing system of single overhead recovery rate.
- Determine the cost of products P and Q using activity based costing system.
- Compute the sales value per quarter of component K using activity based costing system.

ABC for Product Profitability Analysis

Introduction :

An organisation which operates in a competitive environment has to adopt various strategies to survive profitably into the market where it operates. Porter in its generic strategy theory has suggested that a firm can survive profitably in the long term if it chooses its generic strategy according to the environment in which it operates and which conforms to the overall corporate objectives.

A firm would be profitable if it is either a cost leader i.e. it can produce its product at a lower cost than its competitor and enjoy maximum market share or if it produces its products with some peculiar features which make it different from others. Whichever, approach a firm may choose it has to be very careful on the part of actual performance and any deviation from the set performance target. To achieve its objectives, it has to put some performance measurement mechanism into place, so that any deviation can be measured and corrective action can be taken.

Profitability Analysis can be useful to measure the performance of a firm against the acceptable standards. Profitability can be analysed as per the requirement of the management, to assist them to identify the critical success factors and to take appropriate decisions.

Questions on Product Profitability Analysis
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PROBLEM NO. 4 :

Family Store wants information about the profitability of individual product lines : Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 2013 - 14 for each product line :

Particulars	Soft drinks	Fresh produce	Packaged food
Revenues (Rs.)	7,93,500	21,00,600	12,09,900
Cost of goods sold (Rs.)	6,00,000	15,00,000	9,00,000
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000

Family Store also provides the following information for the year 2013 -14 :

Activity	Description of Activity	Total Cost (Rs.)	Cost allocation base
Bottles returns	Returning of empty bottles to store	12,000	Direct tracing of soft-drink line
Ordering	Placing of orders for purchases	1,56,000	No. of purchase orders
Delivery	Physical delivery & receipt of goods	2,52,000	No. of deliveries
Shelf stocking	Stocking of goods on store shelves & on-going restocking	1,72,800	Hours of shelf-stocking time
Customer Support	Assistance provided to customers.	3,07,200	No. of items sold

Required :

- (i) Family Store currently allocates support cost (all costs other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. Calculate the operating income as a % of revenues for each product line.
- (ii) If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using an activity - based costing system, calculate the operating income and operating income as a % of revenues for each product line.
- (iii) Comment on your answers in (i) and (ii) above.

PROBLEM NO. 5 :

The Instrumentation Ltd. manufactures two products, X and Y, using the same equipments and similar processes. An extract of the production data for these products in one period is given below :

Particulars	Product X	Product Y
Quantity produced (units)	10,000	14,000
Selling price per unit (Rs.)	80	150
Material cost per unit (Rs.)	20	25
Direct labour-hours per unit	2	4
Rate per labour hour is Rs. 10		
Machine-hours per unit	6	2
Set-ups in the period	20	80
Orders handled	30	120

Details of overheads costs	Rs.
Relating to machine activity	8,80,000
Relating to production run set-ups	80,000
Relating to handling of orders	1,80,000

Required :

Calculate the product cost and profit per unit using -

- The Traditional Costing Approach using the direct labour-hour rate to absorb overheads and
- The Activity-based costing approach, using suitable cost drivers to trace overheads to products.
- Comment upon the result.

ABC for Customer Profitability Analysis
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In many organisations it is just as important to cost customers as it is to cost products. Different customers or groups of customers differ in their profitability. ABC is a relatively a new technique that makes it possible because it creates cost pools for activities. Customers use some activities but not all, and different groups of customers have different 'activity profiles'.

Service organisations, such as a bank or a hotel, in particular need to cost customers. A bank's activities for a customer will include the following types of activities:

- Withdrawal of cash
- Unauthorised overdraft
- Request for a statement
- Stopping a cheque
- Returning a cheque because of insufficient funds.

Different customers or categories of customers will each use different amounts of these activities and so customer profitability profiles can be built up, and customers can be charged according to the cost to serve them.

A hotel may have activities that are provided for specific types of customers, such as well laid-out gardens, a swimming pool and a bar. Older guests may appreciate and use the garden, families use the swimming pool and business guests use the bar. If the activities are charged to the relevant guests a correct cost per room per day can be calculated for each type of category. This will show the relative profitability and lead to strategies for encouraging the more profitable guests.

Even a manufacturing organization can benefit from costing its customers. Not all customers cost the same to serve even if they require the same products. Some customers may be located a long way from the factory and transport may cost more. Other customers may be disruptive and place rush orders that interrupt production scheduling and require immediate special transport. Some customers need after sales service and help with technical matters, etc.

Benefits of Customer Profitability Analysis

- It helps the supplier to identify which customers are eroding overall profitability and which customers are contributing to it.
- It can help to provide a basis for constructive dialogue between buyer and seller to improve margins.

Questions on Customer Profitability Analysis

PROBLEM NO. 6 :

RST Limited specialized in the distribution of pharmaceutical products. It buys the medicines from the pharmaceutical companies and resells to each of the three different markets viz.

- Supermarket Chains;
- Drugstore Chains; and
- Chemist Shops.

The following data for the month of April in respect of RST Limited has been reported :

Particulars	Supermarket Chains	Drugstore Chains	Chemist Shops
Average revenue per delivery	Rs. 84,975	Rs. 28,875	Rs. 5,445
Average cost of goods sold per delivery	Rs. 82,500	Rs. 27,500	Rs. 4,950
Number of deliveries	330	825	2,750

In the past, RST Limited has used gross margin percentage to evaluate the relative profitability of its distribution channels. Now the company plans to use activity-based costing for analysing the profitability of its distribution channels.

In April, operating costs (other than cost of goods sold) of RST Limited are Rs. 8,27,970. These operating costs are assigned to five activity areas. The cost in each area and the quantity of the cost allocation basis (i.e. cost driver) used in that area for April, are as follows :

Activity Area	Total costs (Rs.)	Cost Drivers
Customer purchase order processing	2,20,000	5,500 orders
Line-item ordering	1,75,560	58,520 line items
Store delivery	1,95,250	3,905 store deliveries
Cartons dispatched to stores	2,09,000	2,09,000 cartons
Shelf-stocking at customer store	28,160	1,760 hours

Other data for April include the following :

Particulars	Supermarket Chains	Drugstore Chains	Chemist Shops
Total number of orders	385	990	4,125
Average number of line items per order	14	12	10
Total number of store deliveries	330	825	2,750
Average number of cartons shipped per store delivery	300	80	16
Average number of hours of shelf- stocking per store delivery	3	0.6	0.1

Required :

- Compute for April, gross margin percentage for each of its three distribution channels and compute RST Limited's operating income.
- Compute the April, rate per unit of the cost-allocation base for each of the five activity areas.
- Compute the operating income of each distribution channel in April, using the activity-based costing information. Comment on the results. What new insights are available with the activity-based cost information?

ANSWER 6 :

1. Statement of Gross Margin and Operating Income:

Particulars	Supermarket Chains	Drugstore Chains	Chemist Shops	Total
	Rs.	Rs.	Rs.	Rs.
(a) Average revenue / delivery	84,975	28,875	5,445	--
(b) Number of deliveries	330	825	2,750	--
(c) Total Revenue [a x b]	2,80,41,750	2,38,21,875	1,49,73,750	6,68,37,375
(d) Average COGS / delivery	82,500	27,500	4,950	--
(e) Total COGS [b x d]	2,72,25,000	2,26,87,500	1,36,12,500	6,35,25,000
(f) Gross Profit [c – e]	8,16,750	11,34,375	13,61,250	33,12,375
(g) Gross margin % [f / c x 100]	2.91%	4.76%	9.09%	--
(h) Other operating cost				8,27,970
(i) Operating Profit [f – h]				24,84,405

2. Statement showing Cost Driver Rates :

Activity Area	Total costs	Cost Drivers	Cost Driver Rate
Customer order processing	Rs. 2,20,000	5,500 orders	Rs. 40 per order
Line-item ordering	Rs. 1,75,560	58,520 line items	Rs. 3 per line item
Store delivery	Rs. 1,95,250	3,905 deliveries	Rs. 50 per delivery
Cartons dispatched to stores	Rs. 2,09,000	2,09,000 cartons	Re. 1 per carton
Shelf-stocking at store	Rs. 28,160	1,760 hours	Rs. 16 per hour

3. Statement of Operating Income using Activity Based Costing:

Particulars	Supermarket Chains	Drugstore Chains	Chemist Shops	Total
	Rs.	Rs.	Rs.	Rs.
(a) Total Revenue [w.n. 1(c)]	2,80,41,750	2,38,21,875	1,49,73,750	6,68,37,375
(b) Total COGS [w.n. 1(e)]	2,72,25,000	2,26,87,500	1,36,12,500	6,35,25,000
(c) Gross Profit [w.n. 1(f)]	8,16,750	11,34,375	13,61,250	33,12,375
(d) Total number of orders	385	990	4,125	5,500
(e) Order processing cost [40 x d]	15,400	39,600	1,65,000	2,20,000
(f) Average number of line items per order	14	12	10	--
(g) Line item ordering cost [Rs. 3 x d x f]	16,170	35,640	1,23,750	1,75,560
(h) Total number of store deliveries	330	825	2,750	3,905
(i) Stores delivery cost [50 x h]	16,500	41,250	1,37,500	1,95,250
(j) Average number of cartons shipped per store delivery	300	80	16	--
(k) Cost of carton dispatching [Re. 1 x h x j]	99,000	66,000	44,000	2,09,000
(l) Average hours of shelf stocking per store delivery	3	0.6	0.1	--
(m) Shelf stocking cost [Rs. 16 x h x l]	15,840	7,920	4,400	28,160
(n) Total Overheads [e + g + i + k + m]	1,62,910	1,90,410	4,74,650	8,27,970
(o) Operating Profit [c - n]	6,53,840	9,43,965	8,86,600	24,84,405
(p) Operating profit % to sales [o / a x 100]	2.33%	3.96%	5.92%	--
(q) Gross margin % [c/a x 100]	2.91%	4.76%	9.09%	--

4. Comments and New Insights:

- Average revenue per delivery and number of deliveries indicate that Supermarket Chains are the bulk buyers and Chemist Shops are the retail buyers.
- Gross profit margin for Supermarket Chain is lower, Drugstore Chain is moderate and Chemist Shop is higher. It gives an idea about the pricing policy of the company of charging low margin to wholesale customer and high margin to retail customer.
- In case of Chemist Shops, the consumption of activities is higher, leading to higher charge of overheads. However, it is taken care by higher gross profit margin as well.
- The gap between gross profit margin and operating profit margin provides a better insight about the overheads charged to each distribution channel. This gap is lowest in case of Supermarket Chains, indicating low consumption of activities and the gap is highest in case of Chemist Shops, indicating high consumption of activities.

PROBLEM NO. 7 :

Alpha Limited has decided to analyse the profitability of its five new customers. It buys bottled water at Rs. 90 per case and sells to retail customers at a list price of Rs. 108 per case. The data pertaining to five customers are:

Particulars	Customers				
	A	B	C	D	E
Cases sold	4,680	19,688	1,36,800	71,550	8,775
List Selling price	108	108	108	108	108
Actual Selling Price	108	106.20	99	104.40	97.20
Number of Purchase orders	15	25	30	25	30
Number of Customer visits	2	3	6	2	3
Number of Deliveries	10	30	60	40	20
Kilometers travelled per delivery	20	6	5	10	30
Number of expedited deliveries	0	0	0	0	1

Its five activities and their cost drivers are :

Activity	Cost Driver Rate
Order taking	Rs. 750 per purchase order
Customer visits	Rs. 600 per customer visit
Deliveries	Rs. 5.75 per delivery km travelled
Product handling	Rs. 3.75 per case sold
Expedited deliveries	Rs. 2,250 per expedited delivery

Required :

- Compute the customer- level operating income of each of five retail customers now being examined (A, B, C, D and E). Comment on the results.
- What insights are gained by reporting both the list selling price and the actual selling price for each customer?
- What factors Alpha Limited should consider in deciding whether to drop one or more of five customers?

ANSWER 7 :

1. Calculation of Customer Level Operating Income:

Particulars	Customers				
	A	B	C	D	E
(a) No. of Cases sold	4,680	19,688	1,36,800	71,550	8,775
(b) List Selling price (Rs.)	108	108	108	108	108
(c) Actual Selling Price (Rs.)	108	106.20	99	104.40	97.20
(d) Actual Sales Revenue [a x c]	5,05,440	20,90,866	1,35,43,200	74,69,820	8,52,930
(e) Number of Purchase orders	15	25	30	25	30
(f) Order taking cost [e x 750]	11,250	18,750	22,500	18,750	22,500
(g) Number of Customer visits	2	3	6	2	3
(h) Customer visit cost [g x 600]	1,200	1,800	3,600	1,200	1,800
(i) Number of Deliveries	10	30	60	40	20
(j) Kilometers travelled / delivery	20	6	5	10	30
(k) Cost of delivery [i x j x 5.75]	1,150	1,035	1,725	2,300	3,450
(l) Product handling [a x 3.75]	17,550	73,830	5,13,000	2,68,313	32,906
(m) No. of expedited deliveries	0	0	0	0	1
(n) Cost of expedited delivery	0	0	0	0	2,250
(o) Cost of goods sold [a x 90]	4,21,200	17,71,920	1,23,12,000	64,39,500	7,89,750
(p) Gross Profit [d – o]	84,240	3,18,946	12,31,200	10,30,320	63,180
(q) Total operating cost [f + h + k + l + n]	31,150	95,415	5,40,825	2,90,563	62,906
(r) Operating Profit [p – q]	53,090	2,23,531	6,90,375	7,39,757	274

Comment on the results :

- (a) Customer D is the most profitable customer inspite of ordering second largest quantity.
- (b) Customer E is the least profitable customer.

2. Insights are gained by reporting both the list selling price and the actual selling price for each customer :

- (a) The difference between the list selling price and actual selling price is the amount of discount offered to each customer.
- (b) A close observation of quantity sold and discount offered reveals the relationship between the two. Except customer E, we find that more discount is offered to a customer who places order for larger quantity.
- (c) It is surprising to note that customer E has been offered highest discount inspite of small order size. Reason for the same is required to be explored.

3. Factors to be considered in deciding whether to drop one or more of five customers :

- Dropping the customer cannot be the best solution, instead we should re-negotiate with them, so that the customers become profitable.
- Specially, we should re-negotiate the discount offered to customer E and also charge him separately for certain services e.g. expedited delivery.

PROBLEM NO. 8 : [ICAI Module]

A and B are two customers of XYZ Electronics Ltd., a manufacturer of Audio Players. Selling Price per unit is ₹ 5,400. It's cost of production per unit is ₹ 4,420.

Additional costs are –

- Order Processing Cost ₹ 2,000 per Order
- Delivery Costs ₹ 3,500 per Delivery

Details of Customers A and B for the period are given below –

Particulars	Customer A	Customer B
Audio Players purchased	350 nos.	500 nos.
Number of Orders	5 (each of 70 units)	10 (each of 50 units)
Number of Deliveries	5	0

The Company's policy is to give a discount of 5% on the Selling Price on orders for 50 units or more, and to further give 8% discount on the undiscounted selling price if a customer uses his own transport to collect the order. Assume that the production levels are not altered by these orders.

- You are required to analyse the profitability by comparing profit per unit for each customer.
- Comment on the discount policy on delivery.

PROBLEM NO. 9 : [RTP - May 2018]

Bookmark LLP is a publishing firm that started operations very recently. The firm has published "Advanced Learner's Dictionary". In the first year, it has been sold to 3 distributors PER, MGH and WLY. The firm's financials reflect profits in its first year of operations. The management is pleased with the results. However, they are interested in finding out how profitable each customer is. This would help them formulate their sales strategy.

Particulars	PER	MGH	WLY
Sales units p.a.	1,000	950	1,250
Sale price (gross)	250	250	250
Payment terms	3/10 net 30	net 30	3/10 net 30
Sales returns	0.5%	0%	10%
Delivery terms	FOB destination	FOB destination	FOB shipping point

In order to get market share, PER and WLY have been extended credit terms to avail discount if payment is made within 10 days. Customer MGH does not have much bargaining power and hence has been allowed only 30 days credit period without any benefit of availing discount for early payment. Both PER and WLY have made payments within 10 days to avail the discount.

On the cost front, variable cost of goods sold is ₹ 150 per unit. Key metrics of customer assignable marketing, administrative and distribution costs are as below:

Activity	Activity Driver	Qty. of Activity Driver			Cost Driver Rate (₹)
		PER	MGH	WLY	
Order taking and processing	# of orders	4	2	15	300
Expedited / rush orders	# of orders	1	-	5	250
Delivery costs	distance in km.	100	50	-	80
Sale return processing	# of returns	1	-	8	150
Billing cost	# of invoices	4	2	15	50
Customer visit	# of visits	1	-	5	800
Inventory carrying cost	# of units sold	1,000	950	1,250	10

Fixed cost that are not assignable to any customer is ₹ 1,00,000 p.a.

Required :

- PREPARE the customer wise profitability statement as also the overall profitability statement of Bookmark LLP.
- RECOMMEND a strategy for Bookmark LLP regarding its customers.

Solution 9 :

(i) Customer Wise & Overall Profitability Statement :

Particulars	PER	MGH	WLY	Total
(a) Sales units p.a.	1,000	950	1,250	3,200
(b) Sale price (gross)	250	250	250	
(c) Gross sale value [a x b]	2,50,000	2,37,500	3,12,500	8,00,000
(d) Sales returns [in %]	0.5%	0%	10%	
(e) Net Sale value [c - d]	2,48,750	2,37,500	2,81,250	7,67,500
(f) Cash discount [e x 3%]	7,462.5	--	8,437.5	15,900
(g) Final Collection [e - f]	2,41,287.5	2,37,500	2,72,812.5	7,51,600
(h) Variable cost of goods sold [a x Rs. 150]	1,50,000	1,42,500	1,87,500	4,80,000
(i) Order taking and processing cost [# of orders x ₹ 300]	1,200	600	4,500	6,300
(j) Expedited order cost [# of orders x ₹ 250]	250	--	1,250	1,500

(k) Delivery costs [distance in km x ₹ 80]	8,000	4,000	--	12,000
(l) Sale return processing [# of returns x ₹ 150]	150	--	1,200	1,350
(m) Billing cost [# of invoices x ₹ 50]	200	100	750	1,050
(n) Customer visits [# of visits x ₹ 800]	800	--	4,000	4,800
(o) Inventory carrying cost [# of units sold x ₹ 10]	10,000	9,500	12,500	32,000
(p) Total assignable cost [h to o]	1,70,600	1,56,700	2,11,700	5,39,000
(q) Customer Profitability [g – p]	70,687.5	80,800	61,112.5	2,12,600
(r) Non assignable fixed cost				1,00,000
(s) Net Profit [q – r]				1,12,600
(t) Profit as % to Sales [q / g x 100]	29.30%	34.02%	22.40%	
(u) Final collection as % of Gross Sales [g / c x 100]	96.52%	100%	87.30%	

(ii) Customer Strategy for Bookmark LLP :

It can be seen that Bookmark LLP has an overall profit of ₹ 1,12,600 which is around 15% of net total collection. While the overall performance is good, the firm's management has to analyze customer wise profitability.

- WLY is the largest customer in terms of units sold. However, Table 1 above shows that sale returns are 10%, which is unusually large compared to other customers. Bookmark LLP has to investigate why the returns are of such large quantity. Possibly, there could be communication gap between the firm and WLY. Possible non-conformity in goods delivered has resulted in returns. Only 87.30% of the original sale value is being collected. The root cause of the problem has to be identified and rectified. This will also reduce the sale return processing costs.
- WLY has placed many rush orders, which requires Bookmark LLP to ship these orders immediately, using costlier means of transportation. Currently, there is no separate charge for shipping rush orders. In order to deter WLY from repeatedly placing rush orders, Bookmark LLP can charge the customer for shipping such orders beyond a threshold number of orders. Say rush orders beyond 2 orders will be charged to the customer.
- WLY has placed 15 orders for 1,250 units. Comparatively, PER and MGH placed 4 and 2 orders for 1,000 units and 950 units respectively. WLY can be requested to place fewer orders with larger quantity per order, in order to optimize ordering cost.

- (d) Being the largest customer, WLY has 5 sale visits (i.e. customer visits) from Bookmark LLP, which is more than the other 2 customers. Priced at ₹ 800 per visit, this is very costly. At the same time, WLY is yielding the least profit. Therefore, Bookmark LLP should reassess if resources can be reallocated to the other two more profitable customers. That may encourage more sales from higher yielding customers.
- (e) Since WLY seems to need more hand-holding in terms of more sales visits as well as higher rush orders, Bookmark LLP may assess if it wants to discontinue or reduce business. Alternatively, it may reassign these resources towards existing or newer customers to get better profitability. However, if WLY can be migrated to a higher profitability, Bookmark LLP need not lose out its market share.
- (f) Customer MGH is the most profitable customer yielding 34% return over sales, although in terms of no. of units ordered, it is the smallest of the three. Bookmark LLP can assess if it can extend some cash discount, in order to encourage more sales. Currently, Customer MGH does not get any cash discount.
- (g) Bookmark LLP can assign more sales visits to Customer PER and MGH to encourage them purchase more as well as provide high quality customer service.

ABC in Advanced Manufacturing Environment

Now a days organization are adopting just in time manufacturing approach and implementing advanced manufacturing technology. More relevant and timely information is required for these organizations to build a sustainable long term competitive advantage. Organization must improve value received by their customers while increasing their own profits simultaneously.

ABC supports the continuous improvement process by allowing management to gain new insights into activity performance, by focusing attention on the sources of demand for activities. Better assessment of cost behavior, increased accuracy in product costing and an attempt to achieve continuous cost improvement are all critical for advanced manufacturing environment.

In advanced manufacturing environment, where support function overheads constitute a large share of total costs, ABC provides more realistic and accurate product costing, as traditional volume based costing system does not take into account the Non-unit Level Overhead Costs such as Setup Cost, Inspection Cost, and Material Handling Cost etc. Cost Analysis under ABC system shows that while these costs are largely fixed with respect to sales volume, but they are not fixed to other appropriate cost drivers.

Further it is pertinent to mention that ABC offers no increase in product-costing accuracy for a single product manufacturing company.

PROBLEM NO. 10 :

Netra Ltd. produces a large number of products including the A and B. The product A is complex product of which 1,000 units are made and sold in each period. The product B is simple product of which 2,000 units are made and sold in each period. Each unit of product A requires one direct labour hour to produce and each unit of product B requires 0.6 direct labour hours to produce. Direct cost per unit of A is Rs. 10 and that of B is Rs. 4

Netra Ltd. employs twelve salaried support staff and a direct labour force that works 4,00,000 direct labour hours per period. Overhead costs are Rs. 5,00,000 per period. The support staff is engaged in three activities – six staff engaged in receiving 25,000 consignments of components per period, three staff engaged in receiving 10,000 consignments of raw materials per period and three staff engaged in disbursing kits of components and materials for 5,000 productions runs per period.

Product A requires 200 component consignments, 50 raw material consignments and ten production runs per period. Product B requires 100 component consignments, eight raw material consignments and five production runs per period.

You are required to :

Identify appropriate cost drivers and calculate product cost of Products A and B, using an Activity-Based Costing System.

PROBLEM NO. 11 : [May 2018 Exam]

ABC Airlines has two divisions organised as profit centres, the Passenger Division and the Cargo Division. The following divisional informations were given for the year ended 31st March, 2018 :

Particulars	Cargo Division	Passenger Division	Total
No. of personnel trained	200	800	1,000
Number of flights	350	250	600
No. of reservations requested	NIL	7,000	7,000
Financial Information :	₹	₹	₹
Revenue	42,00,000	42,00,000	84,00,000
Operating Expenses (excluding service department charges)	36,00,000	28,50,000	64,50,000
Service Dept. Charges :			
Training	3,20,000	3,20,000	6,40,000
Flight Scheduling	1,50,000	1,50,000	3,00,000
Reservation	1,05,000	1,05,000	2,10,000

The service department charge rate for the service department costs was based on revenue. Since the revenue of both the divisions were equal, the service department charges to each division were also the same.

Required :

- Does the income from operations for the two divisions accurately measure performance?
(3 Marks)
- Prepare the divisional income statement using the activity bases provided above in revising the service department charges.
(7 Marks)

Solution 11 :**(i) Statement of Operating Income at present :**

Particulars	Cargo Division	Passenger Division	Total
Revenue	42,00,000	42,00,000	84,00,000
Operating Expenses (excluding service department charges)	36,00,000	28,50,000	64,50,000
Service Dept. Charges :			
Training	3,20,000	3,20,000	6,40,000
Flight Scheduling	1,50,000	1,50,000	3,00,000
Reservation	1,05,000	1,05,000	2,10,000
Operating Profit	25,000	7,75,000	8,00,000

As the service department charges are not based on actual consumption of activities by each division, we can say that the performance of two divisions is not accurately measured. For example - Cargo division does not need passenger reservation service, but it is still charged as 50:50, because revenue generation is in the ratio of 50:50. In the above case, Cargo division is showing very low profits as compared to Passenger division.

(ii) Divisional Income Statement using ABC :

Particulars	Total	Cost Driver	Cargo Division	Passenger Division
(a) Revenue	84,00,000	Given	42,00,000	42,00,000
(b) Operating Exp.	64,50,000	Given	36,00,000	28,50,000
(c) Gross Operating Profit	19,50,000	(a - b)	6,00,000	13,50,000
(d) Training	6,40,000	No. of personnel (200 : 800)	1,28,000	5,12,000
(e) Flight Scheduling	3,00,000	No. of flights (350 : 250)	1,75,000	1,25,000
(f) Reservation	2,10,000	No. of reservations (0 : 7000)	NIL	2,10,000
(g) Operating Profit	8,00,000	(c - d - e - f)	2,97,000	5,03,000

Strategic Profitability Analysis (Using Standard Costing)

Operating Profit of a firm is affected by various components which are responsible for changes in the revenue and costs. A change in the profit may be due to revenue or costs or both the factors.

For analyzing operating income, we spread our analysis into three main areas or components which are (a) Growth Component (b) Price Recovery Component and (c) Productivity Component. Analysis will cover both revenue and cost effect, wherever applicable, on these components separately.

- **Growth Component** – It measures the change in the quantity of output sold. The growth component of the change in the operating income measures the increase / decrease in revenue and in costs due to selling more / less quantity from the previous period. In standard costing, we call it as Sales Volume Variance and Profit Volume Variance.
- **Price Recovery Component** – It measures the change in operating income due to changes in prices. For example – Sales Price Variance, Material Price Variance, Labour Rate Variance etc.
- **Productivity Component** – It measures the change in operating income due to changes in the product mix or yield of efficiency as compared to last year. It is used to measure the cost variances only. For example – Material Usage Variance, Material Mix Variance, Material Yield Variance, Labour Efficiency Variance, Overhead Efficiency Variance etc.

PROBLEM NO. 12 : [ICAI Module]

Y limited is a manufacturer of Cardboard boxes. An analysis of its operating income between 2016 and 2017 shows the following :

Particulars	Income statement (Amount in 2016)	Revenue & Cost effect of Growth component in 2017	Revenue & cost effect of price recovery component in 2017	Cost effect of productivity component in 2017	Income statement (amount in 2017)
Revenue (₹)	40,00,000	2,00,000 (F)	4,20,000 (F)	—	46,20,000
Costs (₹)	29,20,000	60,000 (A)	2,56,000 (A)	58,000 (F)	31,78,000
Operating Income (₹)	10,80,000	1,40,000 (F)	1,64,000 (F)	58,000 (F)	14,42,000

Y limited sold 4,00,000 boxes and 4,20,000 boxes in 2016 and 2017 respectively. During 2017 the market for cardboard boxes grew 3% in terms of number of units and all other changes are due to company's differentiation strategy and productivity.

Required :

Compute how much of the change in operating income from 2016 to 2017 is due to the industry market size factor, productivity and product differentiation and also reconcile the profit of both years due to these factors.

PROBLEM NO. 13 : [Old Syllabus]

The trading results of Jack and Jackson Limited for the year 2019 and 2020 were as follows -

Particulars	2019 (Rs.)	2020 (Rs.)
Materials consumed	1,00,000	1,32,000
Wages	60,000	66,000
Variable Overheads	12,000	14,000
Fixed Overheads	20,000	24,000
Net Profit	8,000	17,000
Sale value of Products	2,00,000	2,53,000

Material prices and wage rates were increased in 2020 by 10% and sale price were also increased by 10%, as compared to 2019.

Prepare a statement showing how much each factor has contributed to the variation of profit.

PROBLEM NO. 14 : [Old Syllabus]

The summarized results of a company for the two years ended 31st December, 2019 and 2020 are given below -

(figures in Rs. Lakhs)

Particulars	2019	2020
Sales	600	770
Direct Materials	300	324
Direct Wages	120	137
Variable Overheads	60	69
Fixed Overheads	80	150
Profit	40	90

As a result of re-organisation of production methods and extensive advertisement campaign used, the company was able to secure an increase in the selling prices by 10% during the year 2020 as compared to the previous year.

In the year 2019, the company consumed 1,20,000 kgs. of raw materials and used 24,00,000 hours of direct labour. In the year 2020, the corresponding figures were 1,35,000 kgs. of raw materials and 26,00,000 hours of direct labour.

You are required to –

Use the information given for the year 2019 as the base year information to analyse the results of the year 2020 and to show in a form suitable to the management, the amount each factor has contributed by way of growth, price recovery and productivity to the change in profit in 2020.

Direct Product Profitability (DPP)

For a profit making organisation, profit earned from an operation is a key performance indicator which assures and controls the direction towards the organisation's objectives. In today's competitive business era most of the firms are having a portfolio of various ranges of products either for the same consumer market or for different consumer markets. A firm which has a portfolio of profitable products enjoys high profitability. However, it is very important to know the relative profitability of an individual product so that management can concentrate on the profitable products and weed out the loss-making products from the products' portfolio. Direct Product Profitability is one among the various analytical methods which analyse the profitability for each product or segment of products separately.

DPP is used to measure the profitability of an individual product and assist management to know the true profitability to make appropriate decisions. As opposed to the traditional absorption costing, where normally labour hours or machine hours are used as a basis for absorption of indirect costs, DPP uses variety of measures like space used for transportation and storing of goods, refrigeration time etc. **DPP is generally used in the retail trade** to determine profitability from an individual product.

Benefits of DPP

- Better cost analysis.
- Better pricing decisions.
- Better management of stores and warehouse space.
- The rationalisation of product ranges.

Direct Product Profitability Statement

Retail organisations traditionally deducted the bought in cost of goods from the selling price to give a gross margin. The gross margin is useless measure for controlling the costs of the organisation itself or making decisions about the profitability of the different products. This is because none of the costs generated by the retail organisation itself are included in its calculation. For example, it does not include the storage costs of the different goods and these costs vary considerably from one goods to another. A method was needed which relates the indirect costs to the goods according to the way the goods uses or creates these costs.

Indirect costs, for DPP may be analysed into basic cost categories as follows:

- (i) **Overhead Cost:** This is incurred through an activity that is not directly linked to a particular product.
- (ii) **Volume Related Cost:** The cost is incurred in relation to the space occupied by products. This includes storage and transport costs.
- (iii) **Product Batch Cost:** This cost is often a time-based cost. If product items (that is a number of identical products which are handled together as a batch) are stocked on shelves a labour time cost is incurred.
- (iv) **Inventory Financing Costs:** This is the cost of tying up money in stock and is the cost of the product multiplied by interest rate per day or per week.

Direct Product Profit can be derived as shown below:

Sales	xx
Less: Cost of Goods Sold	xx
Gross Margin	xx
Less: Direct Product Costs (Warehouse, Transportation, Storage etc.)	xx
Direct Product Profit	xx

Table 1, given below shows the DPP for product A. Directly attributable costs have been grouped into three categories and are deducted from the gross margin to determine the good's DPP.

Table 1 - Direct Product Profit for Product A

Particulars	₹
Selling Price p.u.	150.00
Less: Bought-in Price	80.00
Gross Margin	70.00
Less: Direct Product Costs:	
Warehouse Costs	16.00
Transport Costs	18.00
Stores Costs	22.00
Direct Product Profit p.u.	14.00

Warehouse and stores costs will include items such as labour, space and insurance costs, while, transport costs will include labour, fuel and vehicle maintenance costs. The usual way to spread these costs across the different goods sold is in relation to volume or area occupied, as most costs increase in direct proportion to the volume of the good or the space it occupies.

However, there are some exceptions to this; for example, insurance costs may be better spread on value or on a risk index. Risk is greater with refrigerated or perishable goods. Refrigeration costs must only be related to those products that need to be stored in the refrigerator.

The result of this type of DPP cost analysis may give information such as that given in the following table:

Table 2

Product	Gross Margin (%)	DPP (%)
Ice-Cream	20.40	4.60
Baby Food	11.00	5.50
Tooth Paste	31.20	18.80
Wine	45.30	17.20
Paper Tissues	15.70	0.00

Above table-2 shows that for ice-cream there is a considerable gap between the gross margin and the DPP because its refrigerated storage is expensive. It also shows that paper tissues, which had quite a healthy gross margin, are just breaking even with DPP; this is because they are very bulky relative to their price.

While the super market or other retailer does not have the luxury of stopping selling paper tissues, because obviously, it would lose considerable trade if it did not stock a complete range of goods, it does have other choices. The choices are merchandising ones, such as where to display the stock and in what position on the shelves. Stocks at eye level sells more quickly than the above or below eye level. The brand with the greatest margin should be placed at eye level. Goods at the front of the store tend to sell faster than goods at the back. This explains why tissues are rarely found close to the entrance or the cash counter.

DPP per unit of time adds another dimension to the measurement and DPP per unit of time with per unit of space adds a third. This is more relevant if the overheads cost is dependent on time as well as space both.

In the example in Table-1, the stores costs would be based on a rate per cubic centimeter per day and the product cost can be calculated according to its size and the time it takes to flow through the system. For example, if the stores cost per cubic cm is ₹ 0.0073 per day. Product A is 10 cubic cm and the average stay in the store is three days, then the stores cost per unit of A shall be ₹ 0.0073 × 10 cubic cm × 3 days = ₹ 0.219.

PROBLEM NO. 15 : [ICAI Module]

Jigyasa India Ltd. (JIL) has 30 retail stores of uniform sizes 'Fruity & Sweety Retails' across the country. Mainly three products namely 'Butter Jelly', 'Fruits & Nuts' and 'Icy Cool' are sold through these retail stores. JIL maintains stocks for all retail stores in a centralised warehouse. Goods are released from the warehouse to the retail stores as per requisition raised by the stores. Goods are transported to the stores through two types of vans i.e. normal and refrigerated. These vans are to be hired by the JIL.

Costs per month of JIL are as follows :

Particulars	(₹)	(₹)
Warehouse Costs:		
Labour & Staff Costs	27,000	
Refrigeration Costs	1,52,000	
Material Handling Costs	28,000	2,07,000
Head Office Cost:		
Salary & Wages to Head Office Staff	50,000	
Office Administration Costs	1,27,000	1,77,000
Retail Stores Costs:		
Labour Related Costs	33,000	
Refrigeration Costs	1,09,000	
Other Costs	47,000	1,89,000

Average transportation cost of JIL per trip to any retail stores are as follows :

Particulars	(₹)
Normal Van	3,200
Refrigerated Van	4,900

The Chief Financial Manager asked his Finance managers to calculate profitability based on DPP for three products sold through Fruity & Sweety retail stores rather than traditional method of calculating profitability.

For this, the following information regarding retail store is gathered :

Particulars	Butter Jelly	Fruits & Nuts	Icy Cool
No. of Cartons per cubic metre	42	28	40
No. of Items per cartons (units)	300	144	72
Time in Warehouse (in months)	1	1.5	0.5
Time in Retail Stores (in months)	1	2	1
Selling Price per unit (₹)	84	42	26
Purchase Price per unit (₹)	76	34	22

Butter Jelly and Icy-Cool are required to be kept under refrigerated conditions.

Additional information :

Total Volume of All Goods Sold per month	40,000 m ³
Total Volume of Refrigerated Goods Sold per month	25,000 m ³
Carrying Volume of each van	64 m ³

Required : Calculate the Profit per unit using Direct Product Profitability (DPP) method.

Solution 15 :

1. Calculation of Direct Cost per cubic metre (m³) per month :

Particulars	General Cost (₹)	Refrigeration Cost (₹)
(a) Warehouse cost per month	55,000 [27,000 + 28,000]	1,52,000
(b) Total volume of goods sold p.m.	40,000 m ³	25,000 m ³
(c) Warehouse cost per m ³ p.m. [a / b]	1.375	6.08
(d) Retail store cost per month	80,000 [33,000 + 47,000]	1,09,000
(e) Retail store cost per m ³ p.m. [d / b]	2.00	4.36
(f) Transport cost per trip	3,200	4,900
(g) Carrying volume of each van	64 m ³	64 m ³
(h) Transport cost per m ³ [f / g]	50.00	76.5625

2. Direct Product Profitability (DPP) Statement :

Particulars	Butter Jelly	Fruits & Nuts	Icy Cool
(a) Selling Price per unit (₹)	84	42	26
(b) Purchase Price per unit (₹)	76	34	22
(c) Gross Profit per unit (₹)	8	8	4
(d) No. of Cartons per cubic metre (m ³)	42	28	40
(e) No. of Items per cartons (units)	300	144	72
(f) No. of items per m ³ [d x e]	12,600	4,032	2,880
(g) Warehouse cost per m ³ p.m. [WN 1(c)]	7.455 [1.375 + 6.08]	1.375	7.455 [1.375 + 6.08]
(h) Time in Warehouse (in months)	1	1.5	0.5
(i) Warehouse cost per m ³ [g x h]	7.455	2.0625	3.727
(j) Retail store cost per m ³ p.m. [WN 1(e)]	6.36 [2 + 4.36]	2.00	6.36 [2 + 4.36]
(k) Time in Retail Stores (in months)	1	2	1
(l) Retail Store cost per m ³ [g x h]	6.36	4.00	6.36
(m) Transport cost per m ³ [WN 1(h)]	76.5625	50.00	76.5625
(n) Total DPP cost per m ³ [i + l + m]	90.3775	56.0625	86.65
(o) DPP cost per unit [n / f]	0.0072	0.0139	0.0301
(p) Direct Product Profit per unit [c - o]	7.9928	7.9861	3.9699

ACTIVITY BASED COST MANAGEMENT (ABM)

In the previous section of this chapter we have focused on activity based product costing. Empirical studies of ABC implementation have frequently shown that the greater benefits are derived from its adoption in Cost Management rather than in providing accurate product cost.

The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Cost Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers and the profit received by providing this value. ABM utilises cost information gathered through ABC and through various analysis, ABM manages activities rather than resources. It tries to determine what drives the activities of the organization and how these activities can be improved to increase the profitability.

Business Application of ABM :

ABM views the business as a set of linked activities that ultimately add value to the customer. ABM is based on the premise that activities consume costs. Therefore, by managing activities, costs will be managed in long term. Activities may be grouped in such a way as to describe the total process. For example, serving a particular customer involves a number of discrete activities, but the sum total of these activities represents the process by which the client is serviced. ABM classifies each activity within a process as value-added activities or non-value added activities.

Value-added activities (VA) :

The value-added activities are those activities which are necessary for the performance of the process. Such activities represents work that is valued by the external or internal customer. The customers are usually willing to pay (in some way) for the services. For example, polishing a furniture by a manufacturer dealing in furniture is value added activity.

Non-value-added activities (NVA) :

The NVA activity represents the work that is not valued by the external or internal customer. NVA activities do not improve the quality or function of a product or service, but they can adversely affect costs and prices. Non-value added activities create waste, result in delay of some sort, add cost to the products or services and for which the customer is not willing to pay. Moving materials and machine set up for a production run are examples of NVA activities. NVA activities are found in both the private and public sectors. For example, rerouting documents and the wait or delay in completing a case are examples of NVA activities in the "installment agreements" area.

The preparation of books of accounts, tax returns and other compliance work by organisations do not directly benefit the customers and hence are NVA. But because they are required by law, and the legal compliance is necessary for every business, they are not considered as NVA activities.

Practical Insight 1

A wine manufacturer stores a wine, the manufacturing of which is already completed but which needs to be stored for a specific period to meet the quality standard specified by customer. You are required to identify value-added and non- value-added activity.

If a wine manufacturer stores a wine, the manufacturing of which is already complete but which needs to be stored for a specific period to meet quality standard specified by customer, such storing time would be considered as a value added activity since without this storing activity manufacturing of wine of specified quality would not be complete.

Note : The quality and price of wine enhances as it grows old.

Practical Insight 2

Consider a 50-minute doctor's clinic visit. Suppose a patient spends 10 of those minutes on administrative tasks such as filling out forms, 25 minutes waiting in the reception area and examination room, and 15 minutes with the doctor. The service cycle efficiency for this visit equals to $15/50$, or 30%. In other words, only 30% of the 50 minutes added value to the patient. Minimizing non-value-added service time will allow doctor to treat more patients in less time.

Concept Insight 1

Value added manufacturing activities are tasks that, if eliminated, would reduce the actual or perceived value or utility the customer receives from using the product, such as time actually spent on the product. The rest of the time represents non-value-adding activities that, if eliminated, would not reduce the actual or perceived value or utility customers obtained from using the product. Examples of non-value-added cycle time include the time the product spends waiting for parts or for the next stage in production process, being inspected or repaired, and being moved. By identifying and minimizing the sources of non-value-added cycle time, companies can increase customer responsiveness while reducing costs.

Concept Insight 2

Companies that can eliminate waiting time for a service will find it easier to attract customers. The time taken to process mortgage and loan applications by financial institutions can involve a considerable amount of non-value-added waiting time. Thus, reducing the time to process the applications enhances customer satisfaction and creates the potential for increasing sales revenues. Most of us can observe this difference when we visit a public sector bank and a private bank.

The goal of the ABCM is to make customer needs to be satisfied while making fewer demands for resources. Current research suggests that customers have perceived needs in four areas, all of which must be satisfied simultaneously.

The customers require :

- (i) Lower costs
- (ii) Higher quality
- (iii) Faster response time
- (iv) Greater innovation

To satisfy these customer needs, ABM is being used for a variety of business applications. Such as :

- (i) Cost Reduction
- (ii) Activity Based Budgeting
- (iii) Business process re-engineering
- (iv) Benchmarking
- (v) Performance measurement

Let's discuss each of these business applications :

(i) **Cost reduction** : ABCM helps the organisation to identify costs against activities and to find opportunities to streamline or reduce the costs or eliminate the entire activity, especially if there is no value added. It is particularly useful in identifying and quantifying process waste and providing vehicle for continuous process improvement through continuous cost reduction.

(ii) **Activity Based Budgeting** : Activity Based budgeting, analyses the resource input or cost for each activity. It provides a framework for estimating the amount of resources required in accordance with the budgeted level of activity. Actual results can be compared with budgeted results to highlight both in financial and non-financial terms, those activities with major discrepancies from budget for potential reduction in supply of resources. It is a planning and control system which seeks to support the objectives of continuous improvement.

(iii) **Business process re-engineering** : Business process re-engineering involves examining business processes and making substantial changes in the current business operations. ABCM is a powerful tool for measuring business performance, determining the cost of business output and is used as a means of identifying opportunities to improve process efficiency and effectiveness.

A business process consist of linked set of activities. For example, purchasing of materials might be considered as business process, consisting of activities such as receiving a purchase request, identifying suppliers, preparing purchase orders, mailing purchase orders and performing follow up. This process might be re-engineered by sending the production schedule direct to the suppliers and to enter into contractual agreement to deliver materials according to the production schedule. The end result might be permanent reduction or elimination of some activities.

(iv) **Benchmarking** : Benchmarking is a technique for continuous improvement in performance. It involves comparison of a firm's products, services or activities against other best performing organisations, either internal or external to the firm. The objective is to find out how the product, service or activity can be improved and ensure that the improvements are implemented. It attempts to identify an activity such as customer order processing, which needs to be improved and then finding a non-rival organisation that is considered to represent world class best practice and studying how it performs the activity. It is a performance measure that provides the driving force to establish high performance and means to accomplish these goals. It is thus a component of a wider improvement process such as business process re-engineering for quality improvement.

(v) **Performance Measurement** : Many organisations are now focusing on activity performance as a means of facing competitors and managing costs. To monitor efficiency and effectiveness of activities, performance measures are required. Activity performance measures consist of measures relating to costs, time, quality and innovation.

Difference Between ABC & ABM :

The ABC refers to the techniques for determining the cost of activities and the output that those activities produce. The aim of ABC is to generate improved cost data for use in managing a company's activities.

The ABM is a much broader concept. It refers to the management philosophy that focuses on the planning, execution and measurement of activities as the key to competitive advantage.

Question 16 :

XYZ Ornamental Company has been a name to count on for quality and service. It has been designing wide range of ornamental (decorative) products for more than two decades using the highest-quality standard. Such quality is achieved through years of experience and the integrity that is maintained by its employees. They are known for their perfection. VGG approached XYZ to make inquiry of two products. The two products are indoor fountain known as 'The Star' and another one known as 'Dwarfs' for garden. Mr. Bob, the management accountant of XYZ, has estimated the variable costs per unit of 'The Star' and 'Dwarfs' as being ₹ 622.50 and ₹ 103.75 respectively. He estimated his calculations based on the following information:

(1) Product Data :

Particulars	The Star	Dwarfs	Other Products
Production / Sales (units)	10,000	20,000	80,000
Total Direct Material Cost	₹ 22,50,000	₹ 7,50,000	₹ 60,00,000
Total Direct Labour Cost	₹ 15,00,000	₹ 5,00,000	₹ 60,00,000

- (2) Total variable overheads for XYZ are ₹ 1,20,00,000 out of which 30% belong to the procurement, warehousing and use of direct materials. While all other variable overheads are related to direct labour.
- (3) XYZ presently allocate variable overheads into product units using percentage of total direct material cost and total direct labour cost.
- (4) VGG is willing to purchase 'The Star' at ₹ 740 per unit and 'Dwarfs' at ₹ 151 per unit.
- (5) XYZ will not accept any work yielding an estimated contribution to sales ratio less than 28%.

The directors of XYZ are considering switching to an activity-based costing system and recently appointed a management consultants firm to undertake an in-depth review of existing operations. As result of that review, the consultants concluded that estimated relevant cost drivers for material and labour related overhead costs attributable to 'The Star' and 'Dwarfs' are as follows :

Particulars	The Star	Dwarfs	Other Products
Direct Material Related Overheads : (The volume of raw materials held to facilitate production of each product is the cost driver.)			
Material Volume per product unit	5	8	5
Direct labour related overheads: (The number of labour operations performed is the cost driver)			
Labour Operations per product unit	7	6	5

Required :

- (i) Give a financial ANALYSIS of the decision strategy which XYZ may implement about the manufacture of each product using the unit cost information available.
- (ii) DISCUSS whether activity-based management should be adopted in companies like XYZ.

Solution 16 :**Workings :****(a) Direct Material Cost per unit :**

	The Star	Dwarfs
Total Costs (₹)	22,50,000	7,50,000
Production units	10,000	20,000
Cost per unit (₹)	225.00	37.50

(b) Direct Labour Cost per unit :

	The Star	Dwarfs
Total Costs (₹)	15,00,000	5,00,000
Production units	10,000	20,000
Cost per unit (₹)	150.00	25.00

(c) Variable Overheads :Material Related

Overhead Cost = 30% x ₹ 1,20,00,000 = ₹ 36,00,000

Total Volume Factor

Particulars	Units	Required per unit	Total Volume
The Star	10,000	5	50,000
Dwarfs	20,000	8	1,60,000
Others	80,000	5	4,00,000
Total Volume Factor			6,10,000

Overhead per unit of volume = ₹ 36,00,000 / 6,10,000 = ₹ 5.90 (approx)

Therefore, Overhead Cost per product unit will be as follows:

The Star	5	₹ 5.90	29.50
Dwarfs	8	₹ 5.90	47.20

Labour Related

Overhead Cost = 70% x ₹ 1,20,00,000 = ₹ 84,00,000

Total Operations Factor

Particulars	Units	Required per unit	Total Volume
The Star	10,000	7	70,000
Dwarfs	20,000	6	1,20,000
Other	80,000	5	4,00,000
Total Operations Factor			5,90,000

Overhead per operation = ₹ 84,00,000 / 5,90,000 = ₹ 14.24 (approx)

Therefore, Overhead Cost per product unit will be as follows:

The Star	7	₹ 14.24	99.68
Dwarfs	6	₹ 14.24	85.44

Existing Overhead Recovery Rate :

Material Related

Overhead Cost = 30% x ₹ 1,20,00,000 = ₹ 36 lakhs

Total Material Cost = 22.50 + 7.50 + 60 lakhs = ₹ 90 lakhs

Hence, OH as % of Material Cost = 36/90 = 40%

The Star's share of OH per unit = 225 x 40% = ₹ 90

Dwarf's share of OH per unit = 37.50 x 40% = ₹ 15

Labour Related

Overhead Cost = 70% x ₹ 1,20,00,000 = ₹ 84 lakhs

Total Labour Cost = 15 + 5 + 60 lakhs = ₹ 80 lakhs

Hence, OH as % of Labour Cost = 84/80 = 105%

The Star's share of OH per unit = 150 x 105% = ₹ 157.50

Dwarf's share of OH per unit = 25 x 105% = ₹ 26.25

(d) Product Information (per unit) is as follows:

Particulars	The Star		Dwarfs	
	Current Scenario	ABC Basis	Current Scenario	ABC Basis
Selling Price ... (A)	740.00	740.00	151.00	151.00
Direct Material Cost	225.00	225.00	37.50	37.50
Direct Labour Cost	150.00	150.00	25.00	25.00
Variable Overhead Cost :				
Material Related	90.00	29.50	15.00	47.20
Labour Related	157.50	99.68	26.25	85.44
Total Variable Cost ... (B)	622.50	504.18	103.75	195.14
Contribution ... (A) – (B)	117.50	235.82	47.25	(44.14)
Contribution to Sales (%)	15.88	31.87	31.29	(29.23)

(i) Analysis :

The product costs per unit along with the respective contribution per unit may be calculated either by employing an ABC approach or alternatively by using the existing basis for the allocation of variable overhead cost.

The current scenario of product costing suggests that 'Dwarfs' should be produced as per the request of VGG because the contribution to sales ratio is 31.29%. However, the current scenario of product costing also suggests that XYZ should not undertake production of 'The Star' at a selling price of ₹740 per unit since the estimated contribution to sales ratio is 15.88%, which is lower than the desired contribution to sales ratio of 28%.

Activity based costing approach ensures greater accuracy by using multiple cost drivers and determines areas generating the greatest profit or loss. Table [(d)] shows how much the contribution to sales (%) for each product changes when the overhead allocation method changes to ABC. As shown in Table [(d)], contribution to sales ratio on 'The Star' increased to 31.87% from 15.88% while contribution to sales ratio on 'Dwarfs' reduced from 31.87% to negative 29.23%.

Thus, XYZ should opt to produce 'The Star' for VGG as contribution to sales ratio is 31.87% which is higher than the desired one.

- (ii) The term Activity based management (ABM) is used to describe the cost management application of ABC. The use of ABC as a costing tool to manage costs is known as Activity Based Cost Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers and to improve strategic and operational decisions in an organisation. Kaplan and Cooper divide ABM into Operational and Strategic.

Operational ABM covers the actions that increases efficiency, lower cost (i.e. reduce the cost driver rate of activities) and lead to higher revenue through better resources utilisation. In short, the action required to do things right. In other words, it is all about 'doing things right', using ABC information to improve efficiency. It also helps in identifying and improving value added activities and removing non-value added activities as to reduce cost without distorting product value.

Strategic ABM is about 'doing the right things'. It uses ABC information to determine which products is to be manufactured and which activities is to be used. XYZ can also use this for customer profitability analysis, identifying that which customers are the most profitable and focusing on them more.

A risk with ABM is that some activities have an implicit value are not reflected in a financial value added to any product. For example, a good and pleasant working environment can attract and retain the best human resources, but might not be identified as value added activities in operational ABM.

ABM provides managers an understanding of costs and helps teams to make certain decisions that benefit the whole organization and not just their own activities. Therefore, some companies like XYZ may adopt ABM to improve their operations and obtain useful activity information.

Manufacturing Cycle Efficiency (MCE)

Now a days, people calculate Manufacturing Cycle Efficiency (MCE) by comparing value added time (i.e. processing time) and non value added time (i.e. inspection, waiting, moving etc.). In many manufacturing companies, it is observed that the MCE is less than 10%. It means, value added time is less than 10% of the total time spent on manufacturing activity. Firms with advanced manufacturing systems are trying hard to improve their MCE. Let's try to understand the concepts used in calculation of MCE.

- **Processing Time:** The time during which a product is undergoing conversion activity.
- **Inspection Time:** The amount of time spent confirming that the product is of high quality.
- **Move Time:** The time spent in moving raw materials, WIP, or finished goods between operations.
- **Waiting Time:** The amount of time that raw material or WIP spend while waiting for the next operation.
- **Manufacturing Cycle Time:** It is the total amount of production time required per unit. That is the total of the above four (i.e. Processing time + Inspection time + Move time + Waiting time).
- **Storage Time:** The time during which materials, partially completed products, or finished goods are held in stock before further processing or shipment.
- **Delivery Cycle Time:** It is the average time between the receipt of customer order and delivery of the goods.
- **Velocity** is defined as the number of units produced in a given time.

$$\begin{aligned}
 \text{Manufacturing Cycle Efficiency (MCE)} &= \frac{\text{Processing Time}}{(\text{Processing Time} + \text{Inspection Time} + \text{Waiting Time} + \text{Move Time})} \\
 &= \frac{\text{Processing Time}}{\text{Total Manufacturing Cycle Time}}
 \end{aligned}$$

PROBLEM NO. 17 : [ICAI Module]

Queenstown Furniture (QF) manufactures high-quality wooden doors within the forests of Queenstown since 1952. Management is emphasizing on creativity, engineering, innovation and experience to provide customers with the door they desire, whether it is a standard design or a one-of-a-kind custom door. The following information pertains to operations during April:

Processing time	9.0 hrs.*	Waiting time	6.0 hrs.*
Inspection time	1.5 hr.*	Move time	7.5 hrs.*
Units per batch	60 units		

(*) all the above are average time per batch.

Required :

Compute the following operational measures :

- (i) Average non-value-added time per batch
- (ii) Average value added time per batch
- (iii) Manufacturing cycle efficiency in percentage
- (iv) Manufacturing cycle time per unit

Question 18 : [RTP May 2021]

Glenn Electronics manufactures a wide range of electronic heaters and geysers. Glen was a popular name among retailers and customers, but it keeps on losing the market share. The major reason is that the emerging competitors are offering economical products to customers with similar features and quality. The market is price sensitive, hence adding more features and establishing itself as a premium brand is not the option. The only possible choice left with Glen is to reduce prices and for that it needs to reduce the cost to maintain the profit margin.

A cost management committee was constituted to study the scenario and recommend the solution to the board of directors. The committee based upon their study suggested a 3-phase solution. Out of which, phase one is 'stress on enhancing manufacturing cycle efficiency from its current level of 62.50%'. The committee has collected the following data from the office of the Chief Management Accountant –

- Current batch wait time before the order getting processed is 4 days.
- The time spent working on the products (batch processing time) is currently 30 days.
- Total time spent by the products waiting to be processed, moved, inspected, and delivered (batch queue time) is currently 6 days.
- Currently, the time spent on making sure that the products are not defective (batch inspection time) is double that of the time spent in transferring products between workstations (batch move time).

The Board of directors based upon the committee's report decided to apply cellular manufacturing to reduce unnecessary move time. Based upon the decision, tasks are allocated to concerned functional managers.

Managers and workers showed their resistance by stating – "we are not convinced that cellular manufacturing reduces motions on the production floor". Some workers even mentioned that they are not aware of what is current batch inspection time and batch move time.

Required :

You are a deputy to management accountant and was part of the committee, hence board approached you to convince the managers and workers to be a part of change management.

- (i) CALCULATE current batch inspection time and batch move time.
- (ii) CALCULATE manufacturing cycle time, and how much is non-value-added time? (in term of days)

- (iii) CALCULATE revised manufacturing cycle efficiency if both batch inspection time and batch move time are cut down to half of the current level and other elements remain constant.
- (iv) What makes cellular manufacturing capable to reduce motions on the production floor and how it will benefit the workers? EXPLAIN.

Answer 18 :

Student Note : MCE is already given in the question but batch inspection time and move time is missing. We need to calculate it by making a mathematical equation with the help of MCE.

Please note that Total manufacturing cycle time includes waiting time that Raw material or WIP spends while waiting for the next operation. However, it doesn't include the waiting time spent **before** starting the manufacturing process.

In the above question, it is mentioned that the current batch wait time **before** the order getting processed is 4 days. This waiting time won't be included in the calculation of MCE. However, it will be included in the calculation of **Customer Response Time** (if asked).

(i) Calculation of Batch Inspection Time and Batch Move Time

Let assume that batch move time is 'X' days, then the batch inspection time will be '2X' because currently it is double than the batch move time.

Manufacturing Cycle Efficiency (MCE)

$$= \frac{\text{Processing Time}}{(\text{Processing Time} + \text{Inspection Time} + \text{Queue Time} + \text{Move Time})}$$

$$\text{Hence, } 62.50\% \text{ or } 0.6250 = \frac{20 \text{ days}}{(20 \text{ days} + 2X + 6 \text{ days} + X)}$$

On solving the above linear equation, we will get $X = 2$ days

Hence, **Batch move time (X)** is 2 days and **Batch Inspection time (2X)** is 4 days.

(ii) Calculation of Manufacturing Cycle Time and Non-Value-Added Time (in days)

Total Manufacturing Cycle Time = (Processing + Inspection + Queue + Move Time)

$$= 20 + 4 + 6 + 2 \text{ days} = \mathbf{32 \text{ days}}$$

Non value added time = Inspection + Queue + Move Time

$$= 4 + 6 + 2 \text{ days} = \mathbf{12 \text{ days}}$$

(iii) Calculation of Revised Manufacturing Cycle Efficiency if both batch inspection time and batch move time are cut down to half of the current level.

Revised Move time will be 1 day and Revised Inspection time will be 2 days.

$$\text{MCE}_{\text{Revised}} = \frac{20 \text{ days}}{(20 \text{ days} + 2 \text{ days} + 6 \text{ days} + 1 \text{ day})}$$

$$MCE_{\text{Revised}} = \frac{20 \text{ days}}{29 \text{ days}} = 0.6897 \text{ or } 68.97\%$$

Improvement is recorded from 62.50% to 68.97%, on account of cut down of batch inspection time and batch move time to half of the current level.

- (iv) **Cellular manufacturing** is capable of reducing motions on the production floor. Cellular manufacturing is a **lean way** to enhance productivity by improving the performance in the context of time and motion involved in the production.

Cellular manufacturing is an application of **group technology** in manufacturing in which all or a portion of a firm's manufacturing system has been converted into **manufacturing cells** (a cluster of machines or processes located in close proximity and dedicated to the manufacturing of a family of parts). In this manner cellular manufacturing results in the reduction of move time by reducing material handling (through integrated cell) and transit time and using smaller batch sizes (even single unit).

Hence motion (movement of material & product) and movement of workers (efforts) during production is reduced on the production floor. This may also result in reduced queue time because batch size is small even single piece flow in some cases. This is beneficial to the workers as well in the following ways -

Apart from enhancing the productivity for organizations; firstly a worker has to work less, due to reduced motions. Fatigue will also be less to the worker after working in a shift of the same tenure. If he is a piece-rate worker, then he can earn more wages in the same time. Secondly, since he is working on more than one machine or more than on one part, his job becomes more challenging and hence he may feel more empowered. Hence, cellular manufacturing leads to win-win situation wherein organisation and labour both gets benefitted.

Activity Based Budgeting (ABB)

Activity Based Budgeting is a process of planning and controlling the expected activities for the organisation to derive a cost-effective budget that meets forecast workload and agreed strategic goals. An activity based budget is a quantitative expression of the expected activities of the firm, reflecting management's forecast of workload and financial and non-financial requirements to meet agreed strategic goals and planned changes to improve performance.

Thus, the key elements of ABB are:

- Type of work/activity to be performed;
- Quantity of work/activity to be performed; and
- Cost of work/activity to be performed.

ABB focuses on the activity/ business processes. Resources required are determined on the basis of expected activities and workload. The objective is to bring in efficiency into the system. So, in the process of budget preparation, many key questions need to be addressed and properly answered.

ABB is a technique for enhancing the accuracy of financial forecasts and increasing management understanding. When automated, ABB can rapidly and accurately produce financial plans and models based on varying levels of volume assumptions.

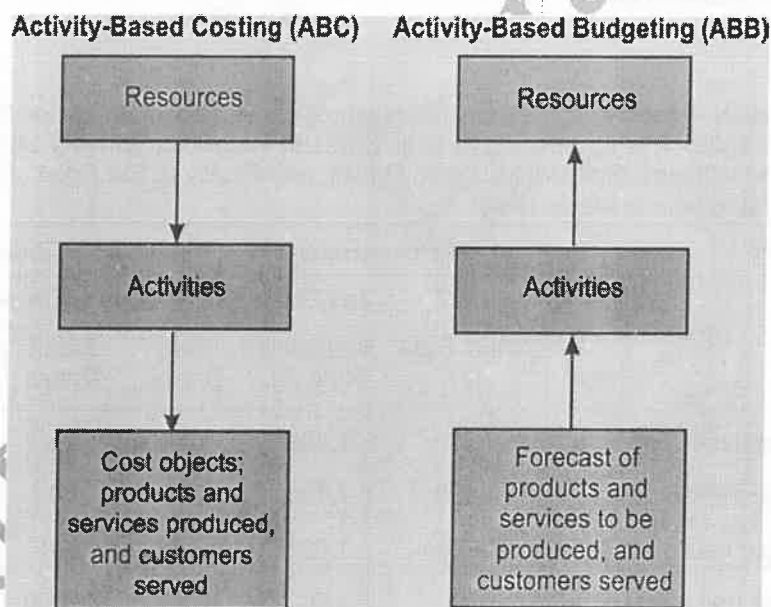


ABB analyzes the products or services to be produced, what activities are required to produce those products or services, and finally what resources are needed to perform those activities. Simply said, ABB is the reversing of the ABC process to produce financial plans and budgets.

Firms that have implemented an activity-based costing system (ABC) may also wish to install an activity-based budgeting (ABB) system.

A budgetary system at the activity level can be a useful approach to support continuous improvement and process management. Furthermore, because activities are what consume resources and, thus, are the causes of costs, activity-based budgeting may prove to be a much more powerful planning and control tool than the traditional, functional-based budgeting approach.

An activity-based budgetary approach can be used to emphasize cost reduction through the elimination of wasteful activities and improving the efficiency of necessary activities.

As with traditional, functional-based budgeting, ABB begins with sales and production budgets. Direct materials and direct labor budgets also are compatible with an ABC framework because these production inputs are directly traceable to the individual products. The major differences between functional and activity-based budgeting are found within the overhead and selling and administration categories. In a functional based approach, budgets within these categories typically are detailed by cost elements. These cost elements are classified as variable or fixed, using production or sales output measures as the basis for determining cost behavior. ABB, on the other hand, identifies the overhead, selling, and administrative activities and then builds a budget for each activity, based on the resources needed to provide the required activity output levels. Costs are classified as variable or fixed with respect to the activity output measure.

Activity Flexible Budgeting

The ability to identify changes in activity costs as activity output changes allows managers to more carefully plan and monitor activity improvements. Activity flexible budgeting is the prediction of what activity costs will be as activity output changes. Variance analysis within an activity framework makes it possible to improve traditional budgetary performance reporting. It also enhances the ability to manage activities. Activity flexible budgets differ from traditional flexible budgets because the cost formulas are based on the activity drivers for the respective activities rather than being based only on a single unit-based driver, such as direct labour hours or number of units produced etc.

Question No. 19 :

6-Twelve is an Indian – Japanese international chain of convenience stores for food, snacks, hot and cold beverages. It is formulating its activity-based budget for January 2018. 6-Twelve has only three product types: Soft Drinks, Fresh Drinks, and Ready to Eat Food. The budgeted data relating to three products are as under:

Activity and Driver	Cost Driver Rates		Jan 2018 Budgeted		
	2017	Jan 2018	Amount of Driver Used		
	Actual Rate (₹)	Budgeted Rate (₹)	Soft Drinks	Fresh Drinks	Ready to Eat Food
Ordering (per purchase order)	5,000	4,500	16	20	16
Delivery (per delivery)	4,000	4,100	13	60	20
Shelf-Stocking (per hour)	1,000	1,050	15	170	93
Customer Support (per item sold)	10	9	4,500	34,600	10,500

6-Twelve has a continuous improvement system to budgeting monthly activity costs for each month of 2018. February's budgeted cost-driver rate is 0.996 times the budgeted January 2018 rate. March's budgeted cost-driver rate is 0.996 times the budgeted February 2018 rate and so on.

Required :

- What is the total budgeted cost for each activity in January 2018?
- What advantages might 6-Twelve gain by using an activity-based budgeting approach over, say, an approach that allocates the cost of these activities to products as a percentage of the cost of goods sold?

- (iii) What is the total budgeted cost for each activity in March 2018 if March 2018 has the same budgeted amount of cost-driver usage as January 2018.
- (iv) What are the benefits of 6-Tweleve adopting a kaizen budgeting approach? What are the limitations?

Solution 19 :

(i) Calculation of Total Budgeted Cost for Each Activity :

(Figures in rupees)

Activity	Cost Hierarchy	Soft Drinks	Fresh Drinks	Ready to Eat Food	Total
Ordering [₹ 4,500 x 16 : 20 : 16]	Batch-Level	72,000	90,000	72,000	2,34,000
Delivery [₹ 4,100 x 13 : 60 : 20]	Batch-Level	53,300	2,46,000	82,000	3,81,300
Shelf stocking [₹ 1,050 x 15 : 170 : 93]	Output Unit Level	15,750	1,78,500	97,650	2,91,900
Customer support [₹ 9 x 4,500 : 34,600 : 10,500]	Output Unit Level	40,500	3,11,400	94,500	4,46,400
Total Budgeted Costs		1,81,550	8,25,900	3,46,150	13,53,600

- (ii) An Activity Based Budgeting approach identifies how different products require different mixes of support activities. The relative percentage of how each product area uses the cost driver at each activity area is:

Activity	Cost Hierarchy	Soft Drinks (%)	Fresh Drinks (%)	Ready to Eat Food (%)	Total (%)
Ordering	Batch-Level	30.77	38.46	30.77	100.0
Delivery	Batch-Level	13.98	64.52	21.50	100.0
Shelf Stocking	Output Unit Level	5.40	61.15	33.45	100.0
Customer Support	Output Unit Level	9.07	69.76	21.17	100.0

By identifying these differences, 6-Tweleve managers are better able to budget for different unit sales levels and different mixes of individual product-line items sold. Using a single cost driver such as 'Cost of Goods Sold' considers similarity in the use of indirect costs (support activities) across product lines, which is not true at 6-Tweleve.

Other benefits cited by managers include:

- Better identification of resource needs.
- Clearer linking of costs with staff responsibilities, and
- Better identification of gap between budget and actual.

(iii) Budgeted Cost Driver Rates for February and March, 2018 : (in rupees)

Activity	Cost Hierarchy	January	February	March
Ordering	Batch-Level	4,500.00	4,482.00	4,464.07
Delivery	Batch-Level	4,100.00	4,083.60	4,067.27
Shelf-stocking	Output Unit Level	1,050.00	1,045.80	1,041.61
Customer support	Output Unit Level	9.00	8.96	8.93

March 2018 rates can be used to compute the budgeted cost for each activity area:

Activity	Cost Hierarchy	Soft Drinks	Fresh Drinks	Ready to Eat Food	Total
Ordering [₹ 4,464.07 x 16 : 20 : 16]	Batch-Level	71,425	89,281	71,425	2,32,131
Delivery [₹ 4,067.27 x 13: 60: 20]	Batch-Level	52,875	2,44,036	81,345	3,78,256
Shelf stocking [₹ 1,041.61 x 15: 170: 93]	Output Unit Level	15,624	1,77,073	96,870	2,89,567
Customer support [₹ 8.93 x 4,500: 34,600: 10,500]	Output Unit Level	40,185	3,08,978	93,765	4,42,928
Total Budgeted Costs		1,80,109	8,19,368	3,43,405	13,42,882

(iv) A kaizen budgeting approach indicates management's commitment to cost reduction.

Let's compare the budgeted costs with the previous costs :

Reference	Ordering	Delivery	Shelf-Stocking	Customer Support	Total
Part (i)	2,34,000	3,81,300	2,91,900	4,46,400	13,53,600
Part (iii)	2,32,131	3,78,256	2,89,567	4,42,928	13,42,882

The kaizen budget number will show unfavorable variances for managers whose activities do not meet the required monthly cost reductions. This is likely to put more pressure on managers to creatively seek out cost reductions by working 'better' within 6-Twelve.

One limitation of kaizen budgeting, as illustrated above, is that it considers minor incremental improvements each month. It is possible that sometimes cost improvements arise from major breakthroughs in operating processes, supplier networks, or customer feedback. Companies need to highlight the importance of seeking these improvements as well as the minor incremental improvements.

PROBLEM NO. 20 :

ABC Electronics makes audio player model "AB100". It has 80 components. ABC sells 10,000 units each month at Rs. 3,000 per unit. The cost of manufacturing is Rs. 2,000 per unit or Rs. 200 lakhs per month for the production of 10,000 units. Monthly manufacturing costs incurred are as follows :

Particulars	Rs. lakhs
Direct Material costs	100.00
Direct manufacturing labour costs	20.00
Machining costs	20.00
Testing Costs	25.00
Rework Costs	15.00
Ordering costs	0.20
Engineering costs	19.80
Total	200.00

Labour is paid on piece rate basis. Therefore, ABC considers direct manufacturing labour costs as variable costs.

The following additional information is available for "AB100" :

- Testing and inspecting time per unit is 2 hours.
- 10 percent of 'AB100' manufactured are reworked.
- It currently takes 1 hours to manufacture each unit of "AB100"
- ABC places two orders per month for each component. Each component is supplied by a different supplier.

ABC has identified activity cost pools and cost drivers for each activity. The cost per unit of the cost driver for each activity cost pool is as follows :

Manufacturing Activity	Description of activity	Cost driver	Cost per unit of cost driver
1. Machining costs	Machining components	Machine hours of capacity	Rs. 200
2. Testing Costs	Testing component and finished products. (Each unit of 'AB100' is tested individually)	Testing hours	Rs. 125
3. Rework costs	Correcting and fixing errors and defects.	Units of "AB100" reworked	Rs. 1,500 per unit
4. Ordering costs	Ordering components of	Number of orders	Rs. 125 per order
5. Engineering costs	Designing and managing products and processes.	Engineering hours	Rs. 1,980 per engineering hour.

Over a long-run horizon, the above cost driver rates are assumed to remain constant.

In response to competitive pressure ABC must reduce the price of its product to Rs. 2,600 and to reduce the cost by at least Rs. 400 per unit. ABC does not anticipate increase in sales due to price reduction. However, if it does not reduce price it will not be able to maintain the current sales level.

Cost reduction on the existing model is almost impossible. Therefore, ABC has decided to replace 'AB 100' by a new model 'AB200', which is a modified version of 'AB100'. The expected effect of design modifications are budgeted as follows :

- (i) The number of components will be reduced to 50.
- (ii) Direct material costs to be lower by Rs. 200 per unit.
- (iii) Direct manufacturing labour costs to be lower by Rs. 20 per unit.
- (iv) Machining time required to be lower by 20 per cent.
- (v) Testing time required to be lower by 20 per cent.
- (vi) Rework to decline to 5 per cent.
- (vii) Machining capacity and engineering hours capacity to remain the same.

ABC currently out sources the rework on defective units.

Required :

- (i) Compare the actual manufacturing cost per unit of 'AB 100' with budgeted cost of 'AB 200'.
- (ii) Determine the impact of design change and pricing decision on the budgeted operating income of ABC.

PROBLEM NO. 21 :

A bank offers three products, viz., Deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods.

The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly. The following information is made available to formulate the budget :

Activity	Present Cost (Rs.)	Estimation for the budget period
1. ATM Services :		
(a) Machine maintenance	4,00,000	(all fixed, no change)
(b) Rents	2,00,000	(fully fixed; no change)
(c) Currency Replenishment	1,00,000	(Expected to double during budget period)
Sub-total	7,00,000	(This activity is driven by no. of ATM transactions)
2. Computer Processing	5,00,000	(Half this amount is fixed and no change is expected) (The variable portion is expected to increase to three times the current level) This activity is driven by the number of computer transactions.

3. Issuing Statements	18,00,000	Presently, 3 lac statements are made. In the budget period, 5 lac statements are expected. For every increase of one lac statements, one lac rupees is the budgeted increase. (this activity is driven by the number of statements)
4. Customer Inquiries	2,00,000	Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes).

The activity drivers and their budgeted quantities are given below:

Particulars	Deposits	Loans	Credit Cards
No. of ATM Transactions	1,50,000	—	50,000
No. of Computer Processing Transactions	15,00,000	2,00,000	3,00,000
No. of Statements to be issued	3,50,000	50,000	1,00,000
Telephone Minutes	3,60,000	1,80,000	1,80,000

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card Accounts.

You are required to:

- Calculate the budgeted rate for each activity.
- Prepare the budgeted cost statement activity wise.
- Find the budgeted product cost per account for each product using (i) and (ii) above.

Activity Based Costing – A Decision Making Tool

It is a useful tool for many of the management decisions facing companies today. It can bring a picture of the operation to light that may not be obvious through other analysis tools. Specifically, ABC is useful in analyzing specific segments of an organization. This might include a market line, a group of products (even a single product), a customer, or an employee. The ABC is implemented in following decisions:

- ABC is a complement to total quality management (TQM). It provides quantitative data that can track the financial impact of improvements implemented as part of the TQM initiative. Some have even suggested that ABC is the most important concept introduced since TQM. Many companies have utilized the ABC/TQM modeling concept to improve performance and profitability.
- Wholesale distributors can gain significant advantage in the decision-making process through implementation of ABC concepts. The expansion of line offerings has brought about difficult decisions for the distributor. Using traditional financial data, overhead burden is distributed equally across the product line. Introduction of new products or vendors might also introduce variance to the overhead. For instance, the need to support a special storage area for control or environmental reasons, or the need of new handling equipment will increase overall operational costs. These costs will be spread over the product line, reducing margin on existing products and reducing the cost impact of the new items.

ABC associates the costs to the activities. Thus the burden created by the new product is correctly reflected. This allows the existing products to enjoy lower cost while leaving the new product line to justify itself.

- Other decisions that can be assisted by ABC include facility and resource expansion. Often the basis for relocation or opening of a new distribution center is based on cost associations. Reduction in freight or other logistics costs can offset the expense of the new facility, staff or equipment. The ABC model can identify the specific cost elements being targeted, providing a much clearer picture from which management can act.
- Decisions regarding support staff cost for human resources can be taken with the help of ABC. Here activity and therefore cost, can be associated to an individual, new levels of financial performance can be determined. This might be appropriate in cases of branch management or sales. Adding or deleting support staff can be determined based on costs of activities as well. The added data provided through ABC can present a number of options, including outsourcing, productivity improvements through automation, and a determination of revenue per employee etc.
- Companies who wish to determine price based on cost plus markup basis find ABC method of costing very relevant and are able to determine competitive prices for their products.
- Using Traditional absorption costing, overheads may get distributed equally across all product lines. ABC traces costs back to the activity and the consumption of resources by each product. Thus, product line profitability can be determined in more realistic terms.

In summary, activity-based costing is a management decision-making tool. It provides financial support data structured in a fashion fundamentally different from accounting data provided in the general ledger. By associating cost to the activity, a clear relationship can be established between sources of activity demand and the related costs. This association can benefit the distributor in determining where costs are being incurred, what is initiating the costs and where to apply efforts to curb inflationary costs. This can be of particular value in tracking new products or customers. It can also provide tracking of logistics costs, one of the fastest growing areas of expense to the distribution operation.

ABC Concept in Practice at Coca Cola

Coca Cola Enterprises Belgium (CCEB) produces, distributes and sells the different brands of 'The Coca-Cola Company'. CCEB services the entire Belgium and Luxembourg market. CCEB is present in more than 85,000 points of sale (supermarkets, grocery stores, companies, hospitals, cinemas, amusement parks, sports centers etc.). By the end of 2009, CCEB employed more than 2,500 employees in Belgium and Luxembourg with revenue of €1.1 billion.

Like many other companies, Coca-Cola Enterprises Belgium was confronted with an increasing Cost to Serve (CTS) due to a changing customer landscape. This created a challenge to which CCEB needed to formulate decisive answers to stay on track towards achieving their growth path and their company objectives.

When companies are confronted with increasing CTS, it is essential to analyse the organisation, its revenues & costs and its processes down to the most detailed level of information. It is this data that give the true reasons behind certain evolutions so that management can take fact-based decisions. When having such a challenge at hand, Activity Based Costing is the most advanced and complete method to gain this information. Thus, CCEB wanted to use the information from ABC analysis to formulate:

- Cost/ Profit Modeling
- Performance Modeling and
- Set-up an Internal Recharge Mechanism to Sales

By implementing Activity-Based Costing, CCEB obtained the right information that enabled them to harmonize and streamline the processes of their different distribution centers.

This made it possible for CCEB to calculate the costs in a fair and transparent way, so that the sales force is charged correctly according to the complexity that Supply Chain had to deal with. From the capacity insights that CCEB got from Activity-Based Costing, multiple initiatives were derived that ultimately led to the redesign of the regional distribution strategy, including:

- Optimizing efficiency and capacity within the logistic department.
- Designing the most efficient processes, based on ABC Analysis.
- Implementing "best practice" processes in the CCEB distribution centers.

These actions successfully reduced their Cost to Serve and still be in line with the new corporate strategy.

11

BUDGETARY CONTROL

“Plans may Fail, but it doesn’t mean One should Fail to Plan.” – CA Rakesh Agrawal

Definitions

Budget is a **quantitative** plan of action for future period and **Budgetary Control** is a technique of exercising overall managerial control of the organisation with the help of budget. (Definition given by CA Rakesh Agrawal)

A Budget has been defined by I.C.M.A London terminology as “A Financial and/or quantitative statement prepared and approved prior to a definite period of time of the policy to be pursued during that period for the purpose of attaining a given objective. It may include income, expenditure and the employment of capital”.

It is a pre-determined detailed plan of actions developed and distributed as a guide to current operation and as a partial basis for subsequent evaluation of performance.

The budget system is both a ‘Plan’ as well as ‘Control’ and therefore it also includes within its broad scope ‘Budgetary Control’. It is an exact and rigorous analysis of the past and the probable and desired future expectations. Thus, Budget is concerned with policy making, while Budgetary Control results from the implementation of the policy.

Budgetary Control system includes -

- i. Preparation of budgets
- ii. Co-ordination between the departments and establishing the responsibilities.
- iii. Comparison of actual performance with that of budget and acting upon results to achieve maximum profitability.

A budget is therefore a formal expression of policies, plans, objectives and goals laid down in advance by top management for the undertaking as whole and for every sub-division thereof.

Budgetary Control is “Systematic control of an organization's operations through establishment of standards and targets regarding income and expenditure, and a continuous monitoring and adjustment of performance against them.”

Brown and Howard defines Budgetary Control is "a system of controlling costs which includes the preparation of budgets, co-ordinating the departments and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability."

Budget is an estimation of revenues and expenses over a specified future period of time which needs to be compiled and re-evaluated on a periodic basis based on the needs of the organisation. Budgetary Control is the process by which budgets are prepared for the future period and are compared with the actual performance for finding out variances, if any.

In other words, Budgetary Control is a process with the help of which, managers set financial and performance goals, compare the actual results with the budgets, and adjust performance, as it is needed.

Pre-requisites of Effective Budgetary Control :

- A serious attitude to the system is required
- Clear demarcation between areas of managerial responsibility
- Reasonable budget targets
- Established data collection, analysis and reporting techniques
- Reports aimed at individual managers, rather than in general
- Fairly short reporting periods, typically a month
- Timely variance reports
- Action being taken to get operations back under control if they are shown to be out of control

Practical Questions on Traditional Budgeting

Question 1 :

Soloproducts Ltd., manufactures and sells a single product and has estimated a sales revenue of Rs.126 lakhs this year based on 20% profit on selling price. Each unit of the product requires 3 lbs of material P and 1.5 lbs of material Q for manufacture as well a processing time of 7 hours in the Machine Shop and 2.5 hours in the Assembly Section. Overheads are absorbed at a blanket rate of 33 1/3% on Direct Labour. The factory works 5 days of 8 hours a day in a normal 52 weeks a year. On an average statutory holidays, leave and absenteeism and idle time amount to 96 hours, 80 hours and 64 hours respectively in a year. The other details are as under –

Purchase Price	Material P	Rs. 6 per lb	
	Material Q	Rs. 4 per lb	
Comprehensive Labour Rate	Machine Shop	Rs. 4 per hour	
	Assembly	Rs. 3.20 / hour	
No. of employees	Machine Shop	600	
	Assembly	180	
Stocks	Finished Goods	Material P	Material Q
Opening stock	20,000 units	54,000 lbs	33,000 lbs
Closing stock (estimated)	25,000 units	30,000 lbs	66,000 lbs

You are required to calculate -

1. The number of units of the product proposed to be sold.
2. Purchase to be made of materials P and Q during the year in Rupees.
3. Capacity utilisation of Machine Shop and Assembly Section, along with your comments.

Question 2 :

Lookahead Ltd., produces and sells a single product. Sales budget for the calendar year, 2017 by quarter is as under

Quarter	No. of Units to be sold
I	12,000
II	15,000
III	16,500
IV	18,000

The year, 2017 is expected to open with an inventory of 4,000 units of finished product and close with an inventory of 6,500 units. Production is customarily scheduled to provide for two-thirds of the current quarter's sales demand plus one-third of the following quarter's demand. Thus production anticipates sales volume by about one month. The standard cost details for one unit of the product is as follows -

Direct Materials 10 lbs. @ 50 paise per lb.

Direct Labour 1 hour 30 minutes @ Rs. 4 per hour.

Variable Overheads 1 hour 30 minutes @ Rs.1 per hour.

Fixed overheads 1 hour 30 minutes @ Rs. 2 per hour based on a budgeted production volume of 90,000 direct labour hours for the year.

- Prepare a production budget for 2017 by quarters, showing the number of units to be produced, and the total cost of direct materials, direct labour, variable overheads and fixed overheads.
- If the budgeted selling price per unit is Rs.17, what would be the budgeted profit for the year as a whole?

Question 3 :

A single product company estimated its sales for the next year quarter wise as under :

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units and the company expects to maintain the closing stock of finished goods at 16,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg. and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below :

Quarter	Purchase of raw materials % to total annual requirement in quantity	Price per kg. Rs.
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of raw materials in the beginning of the year is Rs. 20,000. You are required to present the following for the next year, quarterwise :

- Production budget (in units)
- Raw material consumption budget (in quantity)
- Raw material purchase budget (in quantity and value)

Question 4 :

The direct labour requirements of three of the products manufactured in a factory, each involving more than one labour operation, are estimated as follows –

	Direct Labour Time per unit (in minutes)		
OPERATIONS	PRODUCTS		
	1	2	3
Operation 1	18	42	30
Operation 2	—	12	24
Operation 3	9	6	—

The factory works 8 hours per day, six days in a week. The budget quarter is taken as 13 weeks and during a quarter lost hours due to leave and holiday and other causes are estimated to be 124 hours.

The budgeted hourly rates for the workers managing the operation 1, 2 and 3 are Rs. 2.00, Rs. 2.50 and Rs. 3.00 respectively.

The budgeted sales of the products during the quarter are –

Products	Units
1	9,000
2	15,000
3	12,000

There is a carryover of 5,000 units of Product 2 and 4,000 units of Product 3 and it is proposed to build up a stock at the end of the budget quarter as follows –

Product 1	1,000 units
Product 3	2,000 units

Prepare a Manpower budget for the quarter showing for each product and operation -

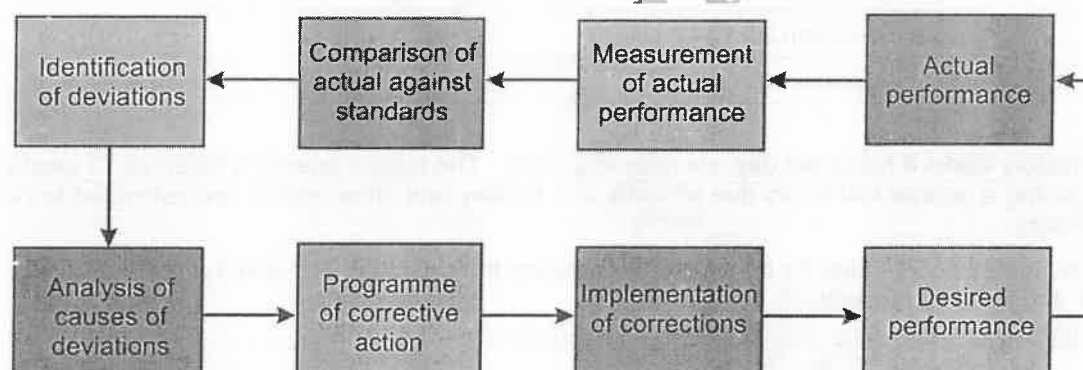
- Direct Labour Hours
- Direct Labour Cost and
- The Number of Workers

Feedback and Feed Forward Control

Feedback and Feed-forward are the two types of Budgetary Control Systems. These systems react automatically to changing environmental dynamics. Each utilizes sensors to measure important factors and a set of rules to react to changes in those factors. Feedback and Feed-forward Controls may coexist in the same system, but the two designs function in very different ways as follows :

Feedback Control :

- Feedback as the name suggests is a reaction after an action has taken place.
- So, there has to be an error if we want to take corrective actions.
- According to the CIMA's Official Terminology, It is defined as: 'Measurement of differences between planned outputs and actual outputs achieved, and the modification of subsequent action and/or plans to achieve future required results.'
- Feedback control is an integral part of budgetary control and standard costing systems.'
- A feedback system would simply compare the actual historical results with the budgeted results.
- In short, it is a reactive control mechanism.
- In feedback control, the information flows from bottom to top.



Types of Feedback :

There are four types of feedbacks –

1. **Primary Feedback** : It could be reported to line management in the form of control reports, comparing actual and budgeted results. If the variances are small or can be corrected easily then the information may not be feedback (passed on) to anyone higher in the organisation.
2. **Secondary Feedback** : In this case a feedback is sent to a higher level in an organisation and can lead a plan being reviewed and possibly changed. For example, the revision of a budget after large variances were discovered due to price changes over time.
3. **Negative Feedback** : It is a feedback taken to reverse a deviation from standard. In simple words, it is an adverse variance reported. For example, a machine may need to be reset to its original settings because it is generating excessive wastage.
4. **Positive Feedback** : It is a favourable variation from standard and it does not need any alteration in the process. However, some incentive should be passed on to the concerned manager.

Control Reports :

Control reports are feedback devices, but they are only part of the feedback system. A control report does not by itself cause a change in performance. A change results only when managers take actions that lead to change. Norton Bedford suggested the following five guidelines for feedback management control reports :

1. Feedback report should disclose both accomplishment and responsibility
2. Feedback reports should be extracted promptly
3. Feedback reports should disclose trends and relationships
4. Feedback reports should disclose variations from standards
5. Feedback reports should be in standardized format

Limitations

Feedback control system does have some operational limitations. First, it depends heavily on success of the error detection system. Second, there may be a time lag between the error detection, error confirmation, and error revision during which actual results may change again.

Feed-forward Control :

- In certain cases, we may be able to measure the amount of error before it has actually taken place. We may thus be able to place a control mechanism before the error takes place. Feed-forward Control is one such controlling system.
- According to the CIMA's Official Terminology, It is defined as the 'forecasting of differences between actual and planned outcomes and the implementation of actions before the event, to avoid such differences.'
- In short, it is a proactive control mechanism.
- In feed-forward control, the information generally flows from top to bottom.

Example 1 :

You have received information about an industrial dispute (say worker's strike) in a company who is a major supplier of an important raw material. This would cause smart buyers to buy before prices go up and their own inventory is exhausted (in contrast, a pure feedback system would not react until inventory had actually fallen).

A Purchase Manager will have to also search for an alternate supplier, who can supply raw material in case of an emergency. Any manager who ignores feed-forward control will contribute to the downfall of a company.

Example 2 :

Smart move Inc. made a smart move in anticipating its sales demand of 1000 units of readymade cloth item for the next year 2020 based on its current year sales and market research that took account for changing customer preferences. However, in the third month of year 2020, COVID news came like bolt from the blue and things changed drastically. The management team therefore changed its anticipation and forecasted that it could only sell 400 units in the year running due to falling purchasing power of customers. Thus, with use of feed forward control, the firm could proactively identify the issue before it happened and could know that the estimated demand would not be met.

Example 3 :

A CA Final student had prepared a plan to appear for Group I in May, 2020 exam. However, due to Covid-19, a nationwide lock down was declared in the month of March, 2020 and ICAI postponed the May, 2020 exam.

Judging from the reports of pandemic from all over the world, he could sense that it will now take a longer time to recover from this situation. He immediately purchased Group II video lectures online and started preparing for Group II also. This way, he could effectively utilise the study leave from office and the extra time available due to lock down, by studying from home.

He then appeared for both the groups in November, 2020 exam and cleared it in the first attempt.

Pre-requisites for successful implementation of Feed-forward Control :

1. Thorough planning and analysis is required
2. Careful discrimination must be applied in selecting input variables
3. The feed-forward system must be kept dynamic
4. A model of control system should be developed
5. Data on input variables must be regularly collected
6. Data on input variables must be regularly assessed
7. Feed-forward control requires action.

Limitations :

Akira Ishiwakawa observed the following limitations of the feed-forward control system:

- The feed-forward process is an evaluation process and is concerned with the estimates of uncertain future. This problem of uncertainty is likely to limit application of the concept.
- Study of future is not well developed; neither are the tools that have potential for overcoming the problem of uncertainty.

Question 5 : Case Study

Real Petroleum Corporation manufactures lubricant oils for motor vehicles (two wheelers, four wheelers and heavy vehicles). The company offers lubricant oils in various packages ranging from a 100 ml pouch to a 200 litre drum. About 70% of sales comprises of 900 ml 'cans'. The process of manufacturing and packaging lubricant oils is given below:

- Base oil of required grade is imported from middle east countries.
- The base oil is blended with additives at the manufacturing plants at specified temperatures to produce lubricant oils.
- The oil is stored for a day to bring the temperature to normal.
- The plant has an automated bottling facility. The operator is required to preset the quantity and number of 'cans' to be filled in a computerised system. No manual intervention is required thereafter.
- The product is filled in 'cans' at the first stage of packaging with 900 ml of product.
- Caps are fixed on the 'cans' and sealed at the second stage of packaging.
- The product is weighed at third stage of packaging (a conversion factor is used to convert volume into weight) before the 'cans' are packed into a carton.
- Any 'can' having lesser quantity of oil is removed before the 'cans' are packed into the cartons.
- The 'cans' which are short filled cannot be reused. Once the seal is broken, the 'can' is of no use.
- There is no process by which the oil in short filled 'can' could be reused. Hence the product is wasted.

The company is considering a proposal to add a component in its packaging unit to avoid losses arising out of quantity issues in packaging. The component will be installed after the first stage of packaging. The component will measure the volume of product and will forward the 'can' for capping and sealing only if the quantity in 'cans' is correct. In case the 'can' does not have required volume of product, the 'can' will be topped up with balance product before the capping and sealing process. The company will be able to achieve 0% wastage due to short filling after implementation of new system.

Required :

Using the context of control systems, IDENTIFY and EXPLAIN the type of control which is existing in the company and the type of control which is proposed.

Solution 5 :

What is Control?

Control is a management function of establishing benchmarks and comparing actual performance against the benchmarks and taking corrective actions. Control is required at all levels of organisation to ensure that the organisation achieves its intended objective. There are two types of control systems - Feedback Control and Feed-forward Control.

Feedback Control

Feedback Control is a control activity that takes place after a process is complete. It is also known as post action control. If any problem is identified after a process is complete, a corrective action is taken to rectify the problem. Feedback control provides information only after the process is complete and sometimes a significant time is lost to take corrective action. Feedback-based systems have the advantage of being simple and easy to implement.

Real Petroleum currently has a feedback control mechanism in place. The actual volume of the product is measured at the end of the packaging process. The current control process is that any 'can' which is short filled is not packed in the carton. This ensures that a lower quantity of product is not supplied into the market. The current control system, however leads to product losses as identification of short-filled 'cans' at the end of process is not useful to the production process. In case, there is a huge variation in the final packaging, the packaging system can be reviewed to ensure that such problems do not occur in the future.

Feed-forward Control

Feed-forward Control is also referred to as a preventive control. The rationale behind feedforward control is to foresee potential problems and take corrective action to ensure that the final output is as expected. Feed-forward controls are desirable because they allow management to prevent problems rather than having to cure them later. Feed-forward control is costly to implement as it requires additional investment and resources. These are designed to detect deviation from standard to allow correction to be made before a particular sequence of actions is completed.

The proposed system in Real Petroleum is a Feed-forward control. In this case, any short filling is identified in the packaging process itself and corrective action is taken to ensure that the final packed 'can' has proper quantity of product. The new process is beneficial to the company as the wastage arising out of the packaging process can be avoided. The savings must be compared with the cost required to modify the packaging process before finalising on whether the new system should be implemented or not.

Question 6 : Case Scenario [ICAI Website]

EW Partners, a leading strategy and management consulting firm is preparing its budgets for the year to 31 March 2019. One of the partner 'W' is concerned about liquidity, he argued, that a firm with adequate liquidity has less risk of being unable to meet their liabilities than an illiquid one. Where a firm has adequate liquidity, there is also the possibility of enriched profitability through reduced interest outlay or increased interest income, together with greater financial flexibility to negotiate better terms with suppliers and financiers or participate in new business opportunities. Accordingly, he desires to reduce the firm's CC to zero by 30 September 2018 and to have a positive cash balance of ₹ 1,45,000 by the end of the year.

Required :

COMPARE and CONTRAST, feed forward control and feedback control in context of the above information.

Solution 6 :

In feed-forward control, instead of actual results being compared against desired results, forecasts are made of what results are expected to be at some future time. If these expectations differ from what is desired, control actions are taken that will minimize these gaps. In brief, it is a preventive activity, which will try to anticipate the future and plan accordingly right now.

In the given scenario, EW Partners has following 2 expectations –

- the first is to reduce the CC to zero by 30th Sept, 2018 and
- the second is to have a positive cash balance of ₹ 1,45,000 by 31 March 2019.

Therefore, to achieve above expectations, a cash budget will be prepared based on various functional budgets showing cash inflows and outflows for each month so that the firm can identify its anticipated monthly cash balance. This can then be compared with the firm's expectations to see if their cash balance objectives are being achieved. However, if the objectives are not met by these budgets, these budgets may need to be revised by changing the levels of activities. It is the process of feed forward control.

Feedback control involves monitoring results achieved against desired results and taking whatever corrective action is necessary if a deviation exists. In brief, it is a corrective activity, where we learn from the past to improve our future results.

Thus, in the case of EW Partners, a comparison of the actual monthly cash balance can be made against the budgeted cash balance for that month. As with any budget and actual comparison there may be an adverse or favorable variance. If this is substantial, then further analysis may be needed to determine its reasons.

The reasons for deviation in cash balance could be, the cash expenses are more than budgeted, or cash receipts are lower than expected, or receivables took less time to pay than expected, or payables were paid later than expected etc. This comparison process is feedback control.

Conclusion

Feed forward control attempts to take preventive action before an event, whereas feedback control takes corrective action after the event.

Question 7 : [RTP May 2021]

The following are 2 types of monthly control reports of a CA firm showing gross collection in (₹ 000). The budgeted collection for the year ending on 31 March are ₹ 4,14,00,000 in total.

Type-X**'Gross Collection' Report prepared in July (₹ 000)**

Activity	Budget	Most Recent Forecast for the year	Expected Variance
Accounting	16,560	17,250	690 (F)
Auditing	10,350	8,280	2,070 (A)
Taxation	14,490	13,386	1,104 (A)
Total	41,400	38,916	2,484 (A)

Type-Y**'Gross Collection' Report prepared in July (₹ 000)**

Activity	Monthly			Cumulative till date		
	Budget	Actual	Variance	Budget	Actual	Variance
Accounting	2,415	2,622	207 (F)	6,210	6,486	276 (F)
Auditing	1,380	966	414 (A)	3,450	2,691	759 (A)
Taxation	1,725	1,587	138 (A)	3,450	3,105	345 (A)
Total	5,520	5,175	345 (A)	13,110	12,282	828 (A)

Required :

IDENTIFY the type of control system for both types of report.

Answer 7 :

Type-X indicates to a feed forward control system. A feed forward control system operates by comparing budgeted results against a forecast. So that, corrective action can be taken to avoid expected adverse variances.

Type-Y reveals feedback control system. A feedback control system identifies variances that has already taken place, by comparing the actual historical results with the budgeted results.

Note – Both Feedback and Feed forward Controls may coexist in the same system, but the two designs function in a very different ways.

Behavioural Aspects of Budgetary Control

Human beings in general don't like to be controlled by others. A manager won't like someone else to set the targets for him and then evaluate his performance to find out the deviations from the target set. The study of this psychological conflict in the implementation of budgetary control system is often termed as behavioural aspects of budgetary control.

In every commercial organisation, an employer would wish to get maximum output from his employees by paying them the lowest wages and salaries. On the other hand, every employee would wish that he should get highest salary without taking any efforts. Thus, employer and employee work together with different motives in their mind. This conflict is required to be handled very skillfully.

Behavioural aspects explains that many of the goals of budgeting are contradictory. On the one side, we want to be able to fairly evaluate the performance of managers. But we also want to motivate managers and therefore, even if managers are not involved in the process, managers may find the budget too challenging and therefore reduce their efforts. That in turn would distort any evaluation.

The participation of managers in setting targets for themselves tend to improve motivation and performance. But the budget themselves may distort the goals as they will be very short term, be focused on cost reduction rather than, say, quality aspects, and they will solely focus on financial aspects of the organisation's goals. There is therefore a conflict between aiming to achieve financial control and communicating the organisation's goals.

Moreover, the budget is framed to act as a plan for a manager, section, or division. The manager may therefore pursue this plan at the cost of other critical success factors that emerge in the internal or external environment of the firm. For example, a production manager may continue to use the planned materials mix even if the sales department are indicating that customers would desire a different product design and the purchasing department have accommodated their purchases accordingly. The production manager then has to choose between the production plan and inter departmental coordination.

Many of the conflicts arise due to the human nature of a budgetary control system. Managers do not always follow organisational goals, they do not always think long term, they may be cautious of moving away from the plan etc. This provides a conflict between many of the goals of a budgetary control system which needs to be considered at a strategic level when implementing such a system.

Budget Slack :

Budget Slack is the deliberate under-estimation of budgeted revenue or over-estimation of budgeted expenses. This allows managers a much better chance of achieving their targets. Managers are worried about achieving their targets, because their incentives and bonuses are linked to the achievement of budgeted numbers.

Thus budget affects the approach and behaviour of managers. Unrealistic demanding targets tend to affect manager's performance adversely. Allowing managers to set their own targets will introduce slack targets. Managers working in an environment where they are expected to meet the budget targets often try to introduce slack into budget. It can have a detrimental impact on the evaluation of actual performance if managers incorporate 'slack' into the budget in order to make it easier to achieve.

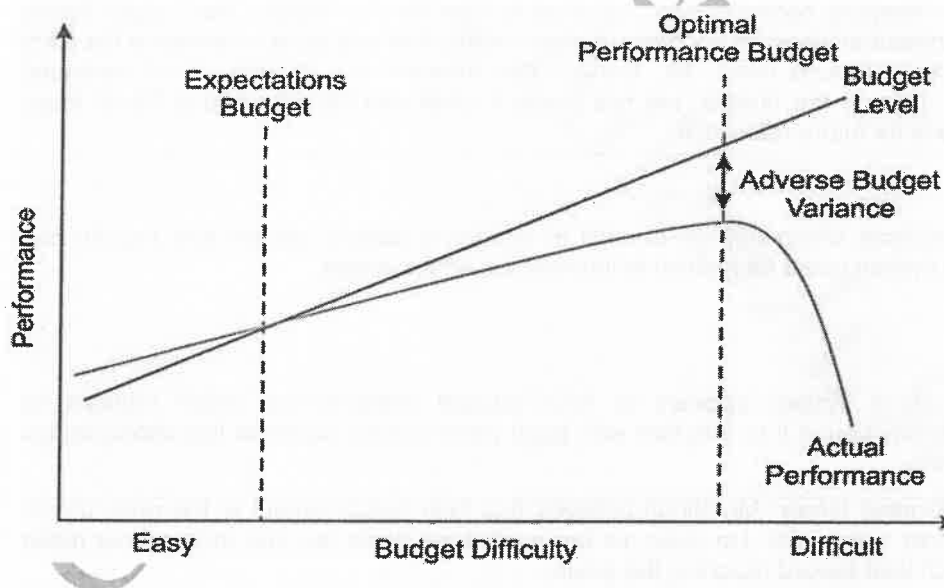
To sum up, if we go by participative style of preparation of budget (to motivate managers), then managers may introduce budget slack. If we go by autocratic style of preparation of budget (i.e. dictatorship style), then the managers will find it difficult to achieve the targets and lose the motivation and confidence to work. This paradoxical situation is discussed below :

Effect of the Budget Difficulty on Performance :

Once budgets have been set as performance targets, surely performance will be evaluated. This can be simply a comparison of actual with budgeted performance or alternatively can be a more detailed comparison of actual performance with flexed budget performance, as is found in variance analysis and operating statements. The evaluation step is often one of the most argumentative as it is here that performance is likely to be criticised and employees will be sensitive. There are many potential difficulties:

- Budgets have no motivational effect unless they are accepted by the managers involved as their own personal targets.
- Beyond a certain point, where the budget is no longer acceptable, the more demanding the target, the worst will be the results achieved.
- Demanding budgets are seen as more relevant than less difficult targets, but negative attitudes result if they are seen as too difficult.
- Acceptance of budgets is facilitated when good upward communication exists. The use of departmental meeting was found helpful in encouraging managers to accept budget targets.
- Managers' reactions to budget targets were found affected both by their own personality and by more general cultural and organizational norms.

The relationship between budget difficulty and the ensuring level of performance can be shown graphically as under :



Budget level that motivates the best level of performance may not be achievable. In contrast, the budget that is expected to be achieved motivates a lower level of performance as managers no longer aspire to meet the higher budget target."

To sum up, the achievable performance is not the best performance of any employee. On the other hand, the best performance of an employee is below the target set. Beyond a certain point, the target becomes so difficult, that the employee loses the motivation to achieve it. As an employee feels that the targets are not achievable in spite of his best efforts, he stops working and the actual performance sharply goes down.

Question 8 : Case Study

"It's frustrating working with Danial. He's very dominant and expects everything to be done his way. We have done more and better work to get up to budget, and the minute we make it he tightens the budget on us. We can't work any faster and still maintain quality. We always seem to be interrupting the big jobs for all those small rush orders. The accountants seem to know everything that's happening in my department, sometimes even before I do. I thought all that budget and accounting stuff was supposed to help, but it just gets me into trouble. I'm trying to put out quality work; they're trying to save money. This is a dead end of my job. I don't see much of a future here." – said Mr. Singh, manager of the machine shop of Global Mfg. Ltd. a UK based Company.

Mr. Singh had just attended the monthly performance evaluation meeting for plant department heads. These meetings had been held on the third Friday of each month since Mr. Danial, MBA from Manchester University, had joined the Indian operations a year earlier.

Mr. Singh had just been given the worst evaluation he had ever received in his long career with Global Mfg. Ltd. He was the most respected and the experienced machinists in the company. Old Plant Manager had often stated that the company's success was due to the high quality of the work of machinists like Mr. Singh. He had been with Global Mfg. Ltd. for many years and was promoted to supervisor of the machine shop when the company expanded and moved to its present location. As supervisor, Mr. Singh stressed the importance of craftsmanship and told his workers that he wanted no careless work coming from his department.

When Mr. Danial became the plant manager, he directed that monthly performance comparisons to be made between actual and budgeted costs for each department. The departmental budgets were intended to encourage the supervisors to reduce inefficiencies and to seek cost reduction opportunities. The company controller was instructed to have his staff 'tighten' the budget slightly whenever a department attained its budget in a given month; this was done to reinforce the plant supervisor's desire to reduce costs. Mr. Danial often stressed the importance of continued progress toward attaining the budget. He has made it clear that he will keep a file of these performance reports for future reference.

Required :

IDENTIFY the problems which appear to exist in budgetary control system and explain how budgetary control system could be revised to improve the effectiveness.

Solution 8 :

The budgetary control system appears to have several shortcomings which reduces its effectiveness and may cause it to interfere with good performance. Some of the shortcomings are explained below.

- Lack of co-ordinated Goals: Mr. Singh believes that high quality output is the goal; it now appears low cost is the goal. He does not know what the goals are and thus cannot make decisions which lead toward reaching the goals.
- Influences of Uncontrollable Factors: The actual performance relative to budget is greatly influenced by uncontrollable factors i.e. rush orders. Thus, the variance reports serve little purpose for evaluation of performance.
- The Short-Run Perspectives: The monthly evaluation and the budget tightening on a monthly basis result in a very short-run perspective. This will result in inappropriate decisions.

The improvements in the budgetary control system must correct the deficiencies described above. Accordingly :

- Budgetary control system must more clearly define the company's objectives.

- Budgetary control system must develop an accounting and reporting system which matches controllable factors with supervisor responsibility and authority.
- Establish budget values for appropriate time periods which do not change monthly, simply as a result of a change in the prior month's performance.
- The entire company from top management level to down level must be educated in sound budgetary procedures so that all parties will understand the total process and recognize the benefit to be gained.

Use of Accounting Information in Performance Evaluation

Correct balance must be established when budgeted performance is evaluated against the actual performance. Otherwise, it may lead to a feeling among the employees that performance appraisal was unjust; due to behavioural aspects of budgeting.

Hofstede (1968) found that stress on the actual results in performance evaluation led to more extensive use of budgetary information, and this made the budget more relevant. However, this stress was associated with a feeling that the performance appraisal was unjust. To overcome this problem, the correct balance must be established when the budgeted performance is evaluated.

Anthony George Hopwood carried out research into the manufacturing division of a US steel works, wherein he studied more than 200 managers with cost centre responsibility in the year 1973. A G Hopwood identified three distinct styles of using budgetary information to evaluate management performance, which he expressed in 'An Accounting System and Managerial Behaviour'. These 3 styles are :

- **Budget Constrained Style** – under this style, the performance of a manager who is responsible for cost centre shall be evaluated **based on ability to achieve budget in the short term**. Hence behavioural problems like short-term decision making at the expense of long-term gain, manipulation of data, and poor working relations with colleagues etc. may emerge.
- **Profit Conscious Style** – under this style, performance of a manager who is responsible for cost centre is evaluated **based upon their ability to increase the long-term effectiveness of their division**. Here, a budget is considered as a guideline rather than a strict target. Hence one cannot say that the budgets are ignored but can say budgets are interpreted flexibly. This style led to better working relations and little manipulation of accounting information due to less or moderate job-related pressure.
- **Non-accounting style** – under this style, the performance of a manager is evaluated mainly on **non-accounting performance indicators** such as quality and customer satisfaction. Hence, budget and budgetary information does not play a substantial or important role in the evaluation of performance. This style also led to better working relations and little manipulation of accounting information due to less or moderate job-related pressure.

The behavioural consequences of the above 3 styles of performance evaluation, may be summarised in a table below :

Type of Activity	Style of Evaluation		
	Budget Constrained	Profit Conscious	Non-Accounting
Involvement with Costs	High	High	Low
Job related tension	High	Medium	Medium
Manipulation of Accounting Information	Extensive	Little	Little
Relations with Superiors	Poor	Good	Good
Relations with Colleagues	Poor	Good	Good

Question 9 : [Jan. 2021 Exam - 10 Marks]

- (i) "Correct balance must be established when budgeted performance is evaluated otherwise it may lead to a feeling that performance appraisal was unjust".

In furtherance of the above object, three distinct styles, namely Budget Constrained Style, Profit Conscious Style and Non-Accounting Style have been observed for using budget and actual cost information in performance evaluation of a manufacturing division. EXPLAIN each of these styles. **(3 Marks)**

- (ii) In K Automotive Ltd., an automobile manufacturer, there is a sudden breakdown of one important machine which would delay the shipment of an important order and required to spend more than the repair budget allocation. ANALYZE the likely behavioural aspects of respective departmental heads in this situation under -

(A) Budget Constrained Style

(B) Profit Conscious Style

(2 Marks)

- (iii) Summarize the effects of the given three styles of management in the below matrix in Table B by putting a suitably coined word given in Table A for each of the specified activity.

Table A

High	Medium	Low	Extensive	Little	Good	Poor
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Table B

Activity	Style of Evaluation		
	Budget Constrained	Profit Conscious	Non-Accounting
Involvement with Costs			
Job related tension			
Manipulation of Accounting information			
Relation with superiors			
Relation with Colleagues			

(5 Marks)

Answer 9 :

- (i) Yes, correct balance must be established when budgeted performance is evaluated otherwise it may lead to a feeling that performance appraisal was unjust; due to behavioural aspects of budgeting. Hofstede (1968) found that stress on the actual results in performance evaluation led to more extensive use of budgetary information, and this made the budget more relevant. However, this stress was associated with a feeling that the performance appraisal was unjust. To overcome this problem, the correct balance must be established when the budgeted performance is evaluated.

Anthony George Hopwood carried out research into the manufacturing division of a US steelworks, wherein he studied more than 200 managers with cost centre responsibility in year 1973. A G Hopwood identified three distinct styles of using budgetary information to evaluate management performance, which he expressed in a book 'An Accounting System and Managerial Behaviour'.

Budget constrained style – under this style, performance of manager who is responsible for cost centre shall be evaluated **based on ability to achieve budget in the short term**. Hence behaviour problems like short-term decision making at the expense of long-term gain, manipulation of data, and poor working relations with colleagues etc. may emerge.

Profit conscious style – under this style, performance of manager who is responsible for cost centre is evaluated **based upon their ability to increase the long-term effectiveness of their division**. Here budget is considered as guidelines rather a strict target hence one cannot say budgets are ignored but can say budgets are interpreted flexibly. This style led to better working relations and little manipulation of accounting information due to less or moderate job-related pressure.

Non Accounting style – under this style, performance of a manager is evaluated mainly on non-accounting performance indicators such as quality and customer satisfaction. Hence, budget and budgetary information does not play a substantial or important role in evaluation.

- (ii) Behavioural problems are often linked to different management styles; budgeting is not an exception.
- (A) Under **budget constrained style**, since the performance of a manager of cost centre shall be evaluated on ability to achieve budget in the short term, hence manager will be criticised in case if spending exceeds the set limit. In such case, managerial behaviour is oriented towards short-term decision making at the expense of long-term gain. Hence, in order to keep expenses within the budgeted limits, departmental head is likely to take a decision of '**not spending more than the repair budget allocated**'.
- (B) Under **profit conscious style**, since the performance of a manager of cost centre shall be evaluated based upon their ability to increase the long-term effectiveness of their division, hence a manager will be prepared to exceed the budgetary limit in the short term if this will result in an increase in long term profit. In such case, managerial behaviour is oriented towards long term effectiveness. Hence, departmental head is not hesitated to spend beyond the set budgeted limit to enable the organisation to meet customer requirements. Here manager is likely to take decision of '**spending more than the repair budget allocated**' so that delay of shipment of an important order can be avoided.

(iii) Table-B :

Activity	Style of Evaluation		
	Budget Constrained	Profit Conscious	Non-Accounting
Involvement with Costs	High	High	Low
Job related tension	High	Medium	Medium
Manipulation of Accounting information	Extensive	Little	Little
Relation with Superiors	Poor	Good	Good
Relation with Colleagues	Poor	Good	Good

Participation in Budget Setting Process

There are two main approaches to budgeting, the **top down** approach and **bottom up** approach. Budgets can be prepared centrally and subordinates have little influence on the target setting. This is called top down budget or **imposed style** approach. The benefit of top down approach is that it can be produced quickly and involve less management time than other options. However, there is a significant risk of inaccurate budgets being set that are also not acceptable to the subordinate managers.

An alternative to top-down approach is for the subordinate managers to participate in the preparation of their own budgets and then these budgets to be reviewed by senior management. This is called bottom up approach (sometimes referred as **participative** approach).

Many researchers have recommended that the bottom up approach involving participation is a preferable method of preparing a budget. Other studies have suggested that participation is not a solution that will solve all the problems. In view of the conflicting opinions about the budget style to be used, it would be advisable for the management of company is evaluate any one option, which is most suitable for them.

Circumstances where Top-Down Budget is Preferable :

- Where personality characteristics of the participation may limit the benefits of participation.
- Where participation by itself is not adequate in ensuring commitment to standards and managers can significantly influence the results or use budget slack.
- Where a process is highly programmable and clear. Stable input-output relationships exist.
- Where a firm has large number of homogeneous units and operating in stable environment.

Question 10 : Case Study

History of the Company

Great Bus Tours Co. Ltd. (GBTCL) is an open top double-decker bus sightseeing company, particularly identified with its special red and cream-colored buses. It commenced operating in small town of Meghalaya in June 2013 with four buses and as of 2017 operated over 44 buses in north east region of India. GBTCL operates five routes with stops at tourist destinations. The company runs hop-on, hop-off bus tours of various hills, with one 24-hour ticket valid for unlimited journeys on the route.

Budget Process / Incentive Plan

As a part of management performance control and incentive scheme, it has been following participative budgeting approach. In GBTCL, budgeting is a joint process in which functional divisions develop their plans in conformity with corporate goals for the next financial year. Based on these plans, divisions prepare functional budgets and send to the appropriate management for review and approval.

The budgets after the incorporation of the feedback and suggestions received from the said management, are finalised for the implementation. These finalised budgets are used as a yardstick for performance measurement. Comparing the actual performance with the yardstick, bonus and other performance related incentives are considered. The higher management believes that this performance control and incentive scheme is very helpful to measure the performance and fixing responsibilities for the responsibility centers.

Budgeted Income Statement :

(₹ '000)

Revenue	1,13,800
Less:	
Variable Costs-	
Direct Material (Fuel, Lubricants and Sundries)	13,600
Direct Labour	40,500
Variable Overheads	7,700
Fixed Costs -	
Operating Overheads (Buses, Garage, Salaries)	18,100
Marketing and Administration	10,700
Profit / (Loss) before taxes	23,200

Current Year's Income Statement :**(₹ '000)**

Revenue	93,500
Less :	
Variable Costs:	
Direct Material (Fuel, Lubricants and Sundries)	19,600
Direct Labour	37,700
Variable Overheads	6,200
Fixed Costs:	
Operating Overheads (Buses, Garage, Salaries)	20,150
Marketing and Administration	10,100
Profit / (Loss) before taxes	(250)

Other Information :

From the above it can be noticed that the current year's actual results were not up to the mark. Actual results were clearly showing adverse performance in comparison with budgeted figures.

Managers of GBTCL were upset because they did not receive the bonus. Ms. Maggie, a Tour Manager of Route No. 3, said –

"We lost 2 months revenue due to heavy rains and fuel prices are almost doubled. We did our best, but these circumstances were beyond our control and we should not be penalized at all."

In support of her statement, Ms. Maggie provided following additional information –

- (a) Rain is common in North East Region. But, the past year set a record in numbers. In July the expected average was 1,577 mm and it actually received 1,810 mm. In August the expected average rain was 990 mm and actual received was 1,535 mm. Heavy rain in these two months disrupted normal life of the region.
- (b) The fuel prices have gone up almost continuously since last year due to surge in global crude oil prices.
- (c) Additional operational expenses ₹ 22,00,000 also incurred to remove the milky appearance of the buses caused due to heavy rain. This cost is incurred to give the bus a new look again, which was not originally planned.

She claimed that – "Revised budget with consideration of the above factors would give different results and lead to different conclusions."

Required : ANALYSE the tour manager's view.

Solution 10 :**Analysis of Issue**

It appears that GBTCL has been badly hit by the weather – high rain in July and August have led to a slump in business. Revenue has seen a fall of around 18% over the budgeted figure. Direct Material (most of the fuel) is 21% of the Sales (compared to 12% of budgeted level) because of hike in fuel price. Variable Overheads are almost same as % of sales.

However, if we remove the additional cost of 22,00,000 from actual fixed operating overheads (i.e. 20,150 – 2,200 = 17,950) then we notice that there is a saving of ₹ 1,50,000 (i.e. 18,100 – 17,950) as compared to the budget figure. Furthermore, there is reduction in fixed Marketing & Administration Cost by ₹ 6,00,000.

The ratio of direct labour to sales has gone up to 40.32 % in 2017 from 35.60% (as budgeted). This increase requires a careful study. It is possible that the labour might be sitting idle due to slump in business and hence the labour cost ratio to sales has gone up.

Award of bonus in case of losses is not justified and managers should be held accountable for their operations. However, they should not be held accountable for the events beyond their control. A manager cannot control movements in fuel price. Managers shouldn't be penalized for the uncontrollable events.

Accordingly, GBTCL should revise the budget to account for uncontrollable events. The revised budgeted income statement is presented below for better comparison.

Revised Budgeted Income Statement :**(₹ '000)**

Revised Revenue [1,13,800 x 10/12 months]	94,833
Less : Variable Costs -	
Direct Material [19,600 x 94,833 / 93,500] (Based on actual expenses due to increase in fuel price)	19,879
Direct Labour [40,500 x 94,833 / 1,13,800]	33,750
Variable Overheads [7,700 x 94,833 / 1,13,800]	6,417
Less : Fixed Costs -	
Operating Overheads [18,100 + 2,200]	20,300
Marketing and Administration (same as original)	10,700
Profit / (Loss) before taxes	3,787

The Revised Profit Margin has come down to 4% as against the Target Profit Margin of 20%. This clearly indicates that the performance was benchmarked against the higher target. If original budget figure is used to measure the performance, it will punish employees for the reasons which are beyond their control.

GBTCL should discuss the variation in the actual performance with respect to the revised budget, with its divisional managers and should try to improve the performance in the next budget period. Continuous monitoring of Budget Performance (achievement / failure) in GBTCL is essential to overcome this situation. This helps to identify where revisions are required in the budget to account for changing conditions, errors, modification to company's plan etc. Monitoring of Budget Performance should be the responsibility of the managers in GBTCL.

Questions on Flexible Budgeting
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PROBLEM NO. 11 :

Deccan Ltd., has prepared the following cost and profit budget for 2019-20 with budgeted sales at Rs. 200 lakhs.

Raw materials	40%
Direct wages	25%
Factory overheads (variable)	10%
Factory overheads (fixed)	5%
Admn. and selling overheads (variable)	6%
Admn. and selling overheads (fixed)	12%
Profit	2%
Total Sales Value	100%

However, after considering the half yearly performance it was felt that the budgeted volume of sales would not be achieved. It was caused due to overall downfall in the general economy globally. The divisional manager has requested the top management of the company to revise the budget target to achieve 80% of the original budgeted level of activity.

You are required to –

Present the original budget and the revised budget based on 80% achievement showing the quantum of profit or loss.

PROBLEM NO. 12 :

Vivek Elementary School has a total of 150 students consisting of the 5 sections with 30 students per section. The school plans for a picnic around the city during the week-end to places such as zoo, the amusement park, the planetarium, etc. A Private Transport operator has come forward to lease out the buses for taking the students. Each bus will have a maximum capacity of 50 (excluding 2 seats reserved for the teachers accompanying the students). The school will employ two teachers for each bus, paying them an allowance of Rs. 250 per teacher. It will also lease out the required number of buses. The following are the other cost estimates -

Particulars	(Rs.)
Breakfast per student	20
Lunch per student	50
Tea per student	10
Entrance Fee at Zoo per student	5
Rent	5,000 per bus
Special Permit Fee	500 per bus
Block Entrance Fee at the planetarium	2,500
Prizes to students for games	2,000

No costs are incurred in respect of the accompanying teachers (except the allowance of Rs. 250 per teacher).

You are required to prepare –

- A flexible budget estimating the total cost at the levels of 30, 60, 90, 120 and 150 students. Each item of cost is to be indicated separately.
- Calculate the average cost per student at these levels.

Beyond Budgeting (BB)

To overcome the limitations of Traditional Budgeting, a tool came into force known as Beyond Budgeting. Beyond Budgeting is a leadership philosophy that relates to an alternative approach to budgeting which should be used instead of traditional annual budgeting.

Limitations of Traditional Budget :

- Time-consuming and costly to put together
- Constrain responsiveness and flexibility
- Often a barrier to change
- Rarely strategically focused and are often contradictory
- Add little value, especially given the time required to prepare
- Concentrate on cost reduction and not on value creation
- Developed and updated too infrequently, usually annually
- Are based on unsupported assumptions and guesswork
- Reinforce departmental barriers rather than encourage knowledge sharing
- Make people feel undervalued.

According to CIMA's Official Terminology- "Beyond Budgeting (BB) is a specific idea which regards the abolition of the traditional budget process as a trigger for improving management control within organisations by a fundamental re-examination of how they might be managed better."

Difference between Traditional Budgeting & Beyond Budgeting :

Points of Differences	Traditional Budgeting Management Model	Beyond Budgeting Management Model
Targets and Rewards	<ul style="list-style-type: none"> • Incremental targets • Fixed incentives 	<ul style="list-style-type: none"> • Stretch goals • Relative targets and rewards
Planning and Controls	<ul style="list-style-type: none"> • Fixed annual plans • Variance controls 	<ul style="list-style-type: none"> • Continuous planning • KPI's & rolling forecasts
Resource and Coordination	<ul style="list-style-type: none"> • Pre-allocated resources • Central coordination 	<ul style="list-style-type: none"> • Resources on demand • Dynamic Coordination
Organizational Culture	<ul style="list-style-type: none"> • Central control • Focus on managing numbers 	<ul style="list-style-type: none"> • Local control of goals / plans • Focus on value creation

Characteristics of Beyond Budgeting :

1. The rolling budgets may incorporate KPIs (i.e. Key Performance Indicators)
2. Benchmarking can be incorporated in budgets.
3. Here the focus of the managers shifts to improving future results.
4. Allow operational managers to react to the environment.
5. Encourage a culture of innovation.
6. More timely allocation of resources.

Suitability of Beyond Budgeting :

1. Industries where there is a rapid change in the business environment - Flexible targets will be responsive to change.
2. Industries using management methods such as TQM – Continuous improvement will be the key.
3. Industries undergoing radical change like BPR – Targets may be hard to achieve in such circumstances.

Benefits of the 'Beyond Budgeting' Model :

- Beyond budgeting helps managers to work in coordination to beat the competition. Internal rivalry between managers is reduced as target shifts to competitors.
- Helps in motivating individuals by defining clear responsibilities and challenges.
- It eliminates some behavioural issues by making rewards team based.
- Proper delegation of authority to operational managers who are close to the concerned action and can react quickly.
- Operational managers do not restrict themselves to budget limits and focus on achieving key ratios.
- It establishes customer orientated teams.
- It creates information systems which provide fast and open information throughout the organisation.

Beyond Budgeting – Principles for Adaptive Performance Management :

Process Principles :

Goals	Set aspirational goals aimed at continuous improvement, not fixed annual targets.
Rewards	Reward are shared based on relative performance, not on meeting fixed annual targets.
Planning	Make planning a continuous and inclusive process, not an annual event.
Controls	Base controls on relative key performance indicators (KPIs) and performance trends, not variances against a plan.
Resources	Make resources available as needed, not through annual budget allocations.
Co-ordination	Co-ordinate cross-company interactions dynamically, not through annual planning cycles.

Leadership Principles :

Customer	Focus everyone on improving customer outcomes, not on meeting internal targets.
Accountability	Create a network of teams accountable for results, not centralised hierarchies.
Performance	Champion success as winning in the marketplace, not on meeting internal targets.
Freedom to Act	Give teams the freedom and capability to act, don't merely require adherence to plan.
Governance	Base governance on clear values and boundaries, not detailed rules and budgets.
Information	Promote open and shared information; don't restrict it to those who 'need to know'.

Implementation of Beyond Budgeting :

There are nine steps that Hope and Fraser consider to be essential for implementing the Beyond Budgeting Approach :

1. Define the case for change and provide an Outline Vision
2. Be Prepared to Convince the Board
3. Get Started
4. Rethink the Role of Finance
5. Train and Educate People
6. Design and Implement New Processes
7. Change Behaviour - New Processes, Not Management Orders
8. Evaluate the Benefits
9. Consolidate the Gains

12

STANDARD COSTING

PRELIMINARY :

Standard costing is a technique used for Cost Control. Under the standard costing system, standards are pre-determined by a group of experts. Then the actual results are compared with standards and the differences are noted. The difference between standard and actual is called as "Variance". These variances are further analysed to know their causes. A suitable action is taken to minimise such variances in future. Thus it is a continuous process.

Variance analysis is "a process of analysing the variances in a manner, which will enable the management to take appropriate actions for off standard performance". Thus variance analysis is an integral part of the Standard Costing System.

According to The Institute of Cost and Management Accountants, England standard costing is "the preparation and use of standard costs, their comparison with actual costs and the analysis of variances to their causes and points of incidence".

PROCESS OF STANDARD COSTING :

1. Setting up the standards of performance i.e. preparation of standard cost sheet
2. Compilation of actual results
3. Comparing actual result with the standard data to note down the variances
4. Analysis of variances to know the possible causes
5. Taking corrective steps to minimise the occurrence of variances in future
6. A continuous process of learning from the past and correcting for future.

TYPES OF VARIANCES :

1. Generally Variances are analysed under the following groups -

- i. Cost Variances
- ii. Sales Variances
- iii. Profit Variances (i.e. Sales Margin Variance)

2. The variances are further analysed into -

- a. Favourable variances (F) i.e. those variances which increases the standard profit. These variances occur when actual cost is less than standard cost or actual output is more than standard output.
- b. Unfavourable or adverse variances (A) i.e. those variances which decreases the standard profit. These variances occur when actual cost is more than standard cost or actual output is less than standard output.
- c. Management may further classify the variances as Controllable or Uncontrollable, depending upon the reason for such variance. It helps management in taking proper corrective action.

MATERIAL COST VARIANCES

In manufacturing industry, the major cost incurred for manufacture of finished product is the cost of raw material. This variance captures the cost of raw material also known as direct material cost.

$$\text{Cost Variance} = \text{Standard material cost of actual output} - \text{Actual Cost}$$

Standard cost of actual Output = Standard quantity required for actual output x Standard Price

Actual Cost = Actual Quantity of raw material consumed x Actual Price

Analysis of Direct Material Cost Variance :

$$\text{i. Price Variance} = \text{*Actual Qty. Consumed} \times (\text{Std. Price} - \text{Actual Price})$$

$$\text{ii. Usage Variance} = \text{Std. Rate} \times (\text{Std. Quantity} - \text{Actual Quantity})$$

*Sometimes, ICAI may provide data relating to actual quantity of raw material **purchased** in the question. In such case, you may additionally calculate "**Purchase Price Variance**" by taking AQ purchased instead of consumed. However, after this change, the total of Price Variance + Usage Variance will not tally with Cost Variance. Don't worry.

Sub-analysis of Usage Variance :

$$\text{a. Mix Variance} = \text{Std. Price} \times (\text{Std. mix}^{**} - \text{Actual Mix}^{*})$$

* Actual mix = actual quantity consumed and

** Std. Mix = total actual quantity consumed revised in standard mixing proportion.

$$\text{b. Yield Variance} = \text{Std. cost per unit of output} \times (\text{Std. Yield}^{*} - \text{Actual Yield})$$

* Std. Yield = Expected output from actual total input.

Alternatively, instead of yield variance, the Sub-Usage variance can be calculated as -

$$\text{Sub Usage Variance} = \text{Std. Price} \times (\text{Std. Qty.} - \text{Std. Mix})$$

Adverse or Favourable :

- (a) In cost variance, if actual cost is more than standard, then the variance is adverse and if lower then it is favourable.
- (b) In price variance, if actual price is more than standard then the variance is adverse and if lower then it is favourable.
- (c) In usage variance, if actual quantity consumed is more than standard then the variance is adverse and if lower then it is favourable.
- (d) In mix variance, if actual mix is more than standard, then the variance is adverse and if lower then it is favourable.
- (e) In yield variance, if actual yield is more than standard, then the variance is favourable and if lower then it is adverse.

- (f) In sub-usage variance, if std. mix (obtained from actual quantity consumed) is more than standard quantity, then the variance is adverse and if lower then it is favourable. This is because, the std. mix is calculated from actual quantity consumed.

Illustration 1 : The following standard and actual data relate to a manufacturing concern :

STANDARD :

Material X - 40 kgs. @ Rs. 6 =	Rs.240
Material Y - 60 kgs. @ Rs. 4 =	Rs.240
Standard output is 80% of input i.e. 80 kgs. Process loss is 20%	

ACTUAL :

Material X - 600 kgs. @ Rs.4
Material Y - 400 kgs. @ Rs.6
Actual output is 70% of input i.e. 700 kgs. Process loss is 30%

You are required to calculate Material Cost Variances.

Solution : Calculation of Material Cost Variances :-

- 1) Total Cost Variance = Std. cost of actual output – Actual cost
 Standard cost = Std. qty. of raw material required for actual output x Std. price.
 Actual output = 700 kgs.
 Std. input output ratio = 100 : 80
 Std. Qty. required for actual output = 700 Kgs. x 100/80 = 875 Kgs.
 Std. Mix ratio = 4 : 6
 Std. Qty. of X = 875 kgs. x 4/10 = 350 kg.
 Std. Qty. of Y = 875 kgs. x 6/10 = 525 kg.

Therefore, Material Cost Variance = (SQ x SP) – (AQ x AP)

X :	(350 kg. x Rs.6) – (600 kg. x Rs.4) =	300 (A)
Y :	(525 kg. x Rs.4) – (400 kg. x Rs.6) =	300 (A)
Total :		600 (A)

- 2) Material Price Variance = Actual qty. consumed x (Std. price – Actual price)
 X : 600 kgs. (Rs. 6 – Rs. 4) = 1200 (F)
 Y : 400 kgs. (Rs. 4 – Rs. 6) = 800 (A)
 Total 400 (F)

3) Material Usage Variance = Std. price x (Std. qty. – Actual qty.)

X : Rs.6 x (350 kg. – 600 kg) = 1500 (A)

Y : Rs.4 x (525 kg. – 400 kg) = 500 (F)

Total 1000 (A)

Sub-Analysis of Material Usage Variance :-

4) Material Mix Variance = Std. price (Std. Mix – Actual mix)

Material	Std. price Rs.	Calculation	Std. mix Kg.	Actual mix Kg.	Variance Rs.
X	6	1000 x 4/10	400	600	1200 (A)
Y	4	1000 x 6/10	600	400	800 (F)
Total			1000	1000	400 (A)

* Actual Mix = Actual Qty. consumed.

** Std. Mix = Actual total quantity consumed, revised in std. mixing proportion.

5) Yield Variance = Std. cost per unit of output x (Std. Yield – Actual Yield)

$$= \frac{\text{Std. cost of actual output}}{\text{Actual output}} \times [\text{Std. output expected from actual input} - \text{Actual output}]$$

$$= \text{Rs. } 4,200 / 700 \text{ kgs. } [(1000 \text{ kg.} \times 80\%) - 700 \text{ kgs. }]$$

$$= \text{Rs. } 6 \times (800 \text{ kgs.} - 700 \text{ kgs.}) = \text{Rs. } 6 \times 100 \text{ kgs.}$$

$$= \text{Rs. } 600 \text{ (A) [Actual Output is less, hence adverse]}$$

OR

Sub-usage Variance (Substitute to Yield Variance) = Std. price x (Std. qty. – Std. mix)

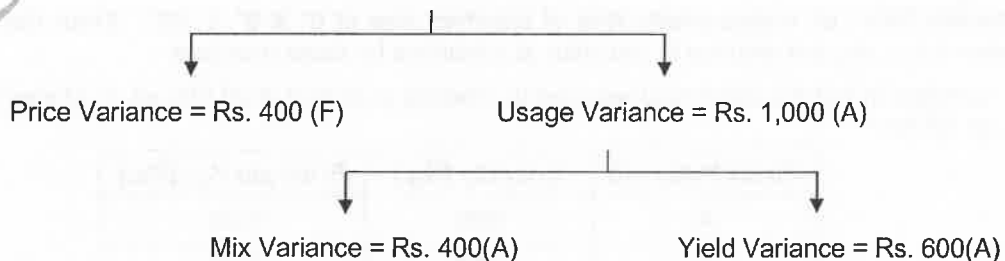
X : Rs. 6 (350 kg. – 400 kg.) = Rs. 300 (A)

Y : Rs. 4 (525 kg. – 600 kg.) = Rs. 300 (A)

Total Rs. 600 (A)

Analysis of Material Cost Variances

Total cost Variance = Rs. 600 (A)



Practical Questions on Material Cost Variance
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PROBLEM NO. 1

The standard material cost for a normal mix of one tonne of Chemical X is based on -

Chemical	Usage (kgs.)	Price per kg. (Rs)
A	240	6
B	400	12
C	640	10

During the month 6.25 tonnes of X were produced from -

Chemical	Consumption Tons	Cost (Rs)
A	1.6	11,200
B	2.4	30,000
C	4.5	47,250

Analyse the variances.

PROBLEM NO. 2

S.V. Ltd. manufactures BXE by mixing three raw materials. Every batch of 100 kgs. of BXE, 125 kgs. of raw materials are used. In April, 60 batches were prepared to produce an output of 5,600 kgs.

Calculate Material Cost Variances from the standard and actual particulars for April, given below:

Raw Material	Standard		Actual		Qty. of RM purchased kg.
	Mix	Price/kg	Mix	Price/kg.	
	%	Rs.	%	Rs.	
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

PROBLEM NO. 3

Modern Tiles Ltd. makes plastic tiles of standard size of 6" X 6" X 1/2". From the following information, you are required to calculate all variances for direct materials -

A standard mix of the compound required to produce an output of 20,000 sq. ft. of tiles 1/2" thick is as follows -

Direct Materials	Quantity (Kg.)	Price per Kg. (Rs.)
A	600	0.90
B	400	0.65
C	500	0.40

During December, eight mixes were processed and actual materials consumed were :

Direct Materials	Quantity Kg.	Price per Kg. (Rs.)
A	5000	0.85
B	2900	0.60
C	4400	0.45

Actual Production for December was 6,20,000 tiles.

PROBLEM NO. 4

Compute the missing data indicated by the Question Marks from the following information -

Particulars		A	B
Standard Price/Unit	(Rs.)	12	15
Actual Price/Unit	(Rs.)	15	20
Standard Input	(kgs.)	50	?
Actual Input	(kgs.)	?	70
Material Price Variance	(Rs.)	?	?
Material Usage Variance	(Rs.)	?	300 (Adverse)
Material Cost Variance	(Rs.)	?	?

Material Mix Variance for both the materials together is Rs. 45 (Adverse).

LABOUR COST VARIANCES

Cost Variance = Standard cost of actual output - Actual Cost

Where, Standard Cost of Actual Output = Std. hours required for Actual Output x Std. Rate
and

Actual Cost = Actual Hours Paid for x Actual Rate

Analysis of Direct Labour Cost Variance :

i. **Rate Variance** = Actual Hours paid x (Std. Rate - Actual Rate)

ii. **Efficiency Variance** = Std. Rate x (Std. Hours - Actual hours paid)

Sub Analysis of Efficiency Variance :

i. **Idle Time Variance** = Std. Rate x (Actual Hours paid - Actual Hours Worked)

ii. **Mix or Gang or Composition Variance** = Std. Rate x (Std. Mix** - Actual Mix*)

iii. **Sub - Efficiency or Yield Variance** = Std. Rate x (Std. Hours - Std. Mix)

* Actual Mix = Actual hours worked

** Std. Mix = Total actual hours worked revised in standard proportion.

Adverse or Favourable :

- (a) In cost variance, if actual cost is more than standard, then the variance is adverse and if lower then it is favourable.
- (b) In rate variance, if actual rate is more than standard, then the variance is adverse and if lower then it is favourable.
- (c) In efficiency variance, if actual hours paid are more than standard then the variance is adverse and if lower then it is favourable.
- (d) Idle time variance is always adverse, because it is the time paid for without getting any output. It is generally calculated for abnormal idle time.
- (e) In mix variance, if actual mix is more than standard, then the variance is adverse and if lower then it is favourable.
- (f) In sub-efficiency variance, if std. mix is more than standard hours, then the variance is adverse and if lower then it is favourable. This is because, the std. mix is calculated from actual hours worked. This is also called as net efficiency variance, for which workers may be held responsible.

Illustration 2 : Calculate all possible Labour cost variances from the following data :-

Particulars	Skilled	Unskilled
Std. time (hrs.)	500	500
Actual time (hrs.)	400	700
Std. rate (Rs/hr.)	15	10
Actual rate (Rs/hr.)	20	15

1) Total Labour Cost Variance = Std. cost of actual output - Actual cost

$$= (\text{Std. time} \times \text{Std. rate}) - (\text{Actual time} \times \text{Actual rate})$$

$$\text{Skilled} = (500 \text{ hrs.} \times \text{Rs. } 15) - (400 \text{ hrs.} \times \text{Rs. } 20) = \text{Rs. } 500 \text{ (A)}$$

$$\text{Unskilled} = (500 \text{ hrs.} \times \text{Rs. } 10) - (700 \text{ hrs.} \times \text{Rs. } 15) = \text{Rs. } 5,500 \text{ (A)}$$

$$\text{Total} \quad \quad \quad \text{Rs. } 6,000 \text{ (A)}$$

2) Labour Rate Variance = Actual time x (Std. rate - Actual rate)

$$\text{Skilled} \quad 400 \text{ hrs.} \times (\text{Rs. } 15 - \text{Rs. } 20) = \text{Rs. } 2,000 \text{ (A)}$$

$$\text{Unskilled} \quad 700 \text{ hrs.} \times (\text{Rs. } 10 - \text{Rs. } 15) = \text{Rs. } 3,500 \text{ (A)}$$

$$\text{Total} \quad \quad \quad \text{Rs. } 5,500 \text{ (A)}$$

3) Labour Efficiency Variance = Std. rate x (Std. time - Actual time)

$$\text{Skilled} \quad \text{Rs. } 15 \times (500 \text{ hrs.} - 400 \text{ hrs.}) = \text{Rs. } 1,500 \text{ (F)}$$

$$\text{Unskilled} \quad \text{Rs. } 10 \times (500 \text{ hrs.} - 700 \text{ hrs.}) = \text{Rs. } 2,000 \text{ (A)}$$

$$\text{Total} \quad \quad \quad \text{Rs. } 500 \text{ (A)}$$

4) **Labour Mix Variance** = Std. Rate x (Std. mix - Actual mix)

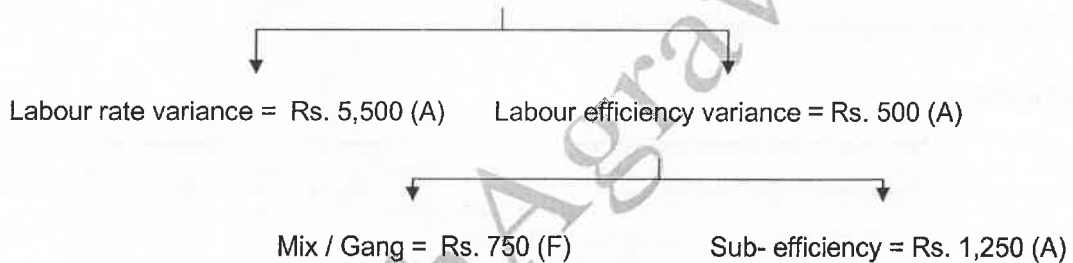
Worker	Std. rate Rs.	Calculation	Std. mix hrs.	Actual mix hrs.	Variance Rs.
Skilled	15	1100 x 50 %	550	400	2,250 (F)
Unskilled	10	1100 x 50 %	550	700	1,500 (A)
Total			1100	1100	750 (F)

5) **Sub-efficiency Variance** = Std. rate x (Std. hrs. - Std. mix)

Skilled	Rs. 15 x (500 hrs.- 550 hrs.)	=	Rs. 750 (A)
Unskilled	Rs. 10 x (500 hrs.- 550 hrs.)	=	Rs. 500 (A)
Total			Rs. 1,250 (A)

Analysis of Labour Cost Variances

Total Labour Cost Variance = Rs. 6,000 (A)



Practical Questions on Labour Cost Variance

PROBLEM NO. 5

The standard labour component and the actual labour component is given below :

Particulars	Skilled Workers	Semi-skilled Workers	Un-skilled Workers
Standard number of workers in the gang	32	12	6
Standard wage rate per hour (Rs.)	13	12	11
Actual number of workers employed in the gang during the week	28	18	4
Actual wage rate per hour (Rs.)	14	13	12

During the 40 hours working week the gang produced 1800 standard labour hours of work.
Calculate all types of labour cost variances.

PROBLEM NO. 6

The gang of workers normally consists of 30 men, 15 women and 10 boys. They are paid at standard hourly rates as under -

Men ... Rs. 18 Women ... Rs. 16 Boys ... Rs. 14

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output.

During the week ended 31st May, the gang consisted of 40 Men, 10 Women and 5 boys. The actual wages paid were @ Rs. 17, Rs. 15 and Rs. 13 respectively. 4 hours were lost due to idle time and 1600 units were produced.

Calculate -

- i. Cost Variance
- ii. Labour Rate Variance
- iii. Labour Efficiency Variance
- iv. Gang Variance (i.e. Labour Mix Variance)
- v. Labour Idle Time Variance.

PROBLEM NO. 7

From the following data, compute the Wage Variances -

STANDARD -

Number in the Standard Gang	Men 20,	Women 10
Standard wage rate per hour	Rs. 9	Rs. 8
Standard output per Gang hour	50 units	

ACTUAL -

Number in the Actual Gang		Men 16	Women 18
Actual Wage rate per hour		Rs. 10	Rs. 5
Actual Gang hours paid for	40		
Actual Gang hours worked for	39		
Abnormal idle time	1 Gang hour		
Actual Output	2,400 units		

PROBLEM NO. 8

The following data relate to a factory :

Particulars	Skilled Men	Un-skilled Men
Number in Standard Gang	20	10
Standard Rate per hour	Rs. 10	Rs. 6
Number in Actual Gang	16	14
Actual Rate per hour	Rs. 9	Rs. 7

48 hours a week has worked and the actual output was 1,200 standard hours. Compute Labour Cost Variances assuming that -

- (a) There is no abnormal idle time and
- (b) Abnormal idle time is one hour per employee.

PROBLEM NO. 9 : [3 Variance Method]

From the following information, calculate labour cost variances using 3 variance method :

- Standard time per unit = 5 hours
- Standard wage rate = Rs. 40 per hour
- Actual wage rate = Rs. 38 per hour
- Actual Output = 1,000 units
- Actual hours paid = 5,500
- Actual hours worked = 5,300

PROBLEM NO. 10

The following information relates to labour of X Ltd.

Type of Labour	Skilled	Semi Skilled	Unskilled	Total
No. of workers in standard gang	4	3	2	9
Standard rate per hour (Rs.)	6	3	1	-
Number of workers in actual gang				9
Actual wage rate per hour (Rs.)	7	2	2	-

In a 40 hours week, the gang produced 270 standard hours.

The actual number of semi-skilled workers is two times the actual number of unskilled workers. The rate variance of semi-skilled workers is Rs. 160 (F).

Find the following:

- (i) The number of workers in each category
- (ii) Total gang variance
- (iii) Total Sub-efficiency variance
- (iv) Total labour rate variance
- (v) Total labour cost variance

VARIABLE OVERHEAD COST VARIANCES

For calculation of overhead cost variances, first we have to calculate the standard rates of recovery of overheads as follows -

$$\text{Standard Rate of Recovery per unit (SRR/unit)} = \frac{\text{Budgeted Overheads}}{\text{Budgeted Output}}$$

$$\text{Standard Rate of Recovery per hour (SRR/hour)} = \frac{\text{Budgeted Overheads}}{\text{Budgeted Hours}}$$

Variable Overhead Cost Variance

$$\begin{aligned} &= \text{Standard Recovered Overheads for Actual Output} - \text{Actual overheads} \\ &= (\text{Actual Output} \times \text{SRR / unit}) - \text{Actual overheads} \\ &= \text{Overheads Absorbed} - \text{Overheads Incurred} \end{aligned}$$

Analysis of Variable Overhead Cost Variance :

- i. **Expenditure / Budget Variance** = (Actual hours x SRR/hour) – Actual Overheads
- ii. **Efficiency Variance** = SRR/hour x (Std. hours for actual output – Actual hours)

NOTE : The above variances can also be calculated by using alternate formulae by substituting SRR/unit instead of SRR/hour, standard output instead of actual hours and standard hours instead of actual output.

Adverse or Favourable :

- (a) In cost variance, if actual overheads are more than standard, then the variance is adverse and if lower then it is favourable.
- (b) In expenditure variance, if actual overheads are more than standard then the variance is adverse and if lower then it is favourable.
- (c) In efficiency variance, if actual hours are more than standard then the variance is adverse and if lower then it is favourable.

Illustration 3 :

The following information is obtained from the cost records of Unique Ltd. which uses Standard Costing System. Calculate Variable Overhead Cost Variances.

Particulars	Budget	Actual
Production (units)	4,000	3,800
Labour Hours	8,000	6,650
Variable Overheads (Rs.)	12,000	12,000

Solution :-

i) Std. rate of recovery per unit (i.e. SRR / unit)

$$= \frac{\text{Bud. overheads}}{\text{Bud. production}} = \frac{\text{Rs. 12,000}}{4,000 \text{ units}} = \text{Rs. 3 per unit.}$$

$$\text{ii) SRR / hr.} = \frac{\text{Bud. overheads}}{\text{Bud. hours}} = \frac{\text{Rs. 12,000}}{8,000 \text{ hrs.}} = \text{Rs. 1.50 per hr.}$$

iii) Standard output 4,000 units in 8,000 hours, i.e. 1 unit requires 2 hours.

$$\begin{aligned} \text{1) Total cost variance} &= \text{Std. recovered overheads on actual output} - \text{Actual overheads} \\ &= (\text{Actual output} \times \text{SRR/unit}) - \text{Actual overheads} \\ &= (3,800 \text{ units} \times \text{Rs. 3}) - \text{Rs. 12,000} \\ &= \text{Rs. 11,400} - \text{Rs. 12,000} = \text{Rs. 600 (A)} \end{aligned}$$

$$\begin{aligned} \text{2) Expenditure variance} &= \text{Std. overheads for actual hrs.} - \text{Actual overheads.} \\ &= [(\text{Actual hrs.} \times \text{SRR / hr.}) - \text{Rs. 12,000}] \\ &= [(6,650 \text{ hrs.} \times \text{Rs. 1.50}) - \text{Rs. 12,000}] \\ &= \text{Rs. 9,975} - \text{Rs. 12,000} = \text{Rs. 2,025 (A)} \end{aligned}$$

$$\begin{aligned} \text{3) Efficiency variance} &= \text{SRR/hour (Std. Hours - Actual Hours)} \\ &= \text{Rs. 1.50 [(3,800} \times 2 \text{ hrs.)} - 6,650 \text{ hrs.]} \\ &= \text{Rs. 1.50 (7,600 - 6650 hours)} = \text{Rs. 1,425 (F)} \end{aligned}$$

Analysis of Variable overhead Cost Variances

Total cost variance = Rs. 600 (A)

Expenditure = Rs. 2,025 (A)

Efficiency = Rs. 1,425 (F)

Practical Questions on Variable OH Cost Variance

PROBLEM NO. 11

The following data is obtained from the books of manufacturing company regarding variable overheads. Calculate and analyse the variances.

Budgeted Production for January	300 units
Actual Production for January	250 units
Budgeted Variable Overhead	Rs. 7,800
Actual Hours	4,500 hours
Standard Time for one unit	20 hours
Actual Variable Overhead	Rs. 7,000

PROBLEM NO. 12

From the following data relating to Modern Manufacturers, prepare variable overhead variance analysis.

Standard :	Actual :
Production = 5,000 units	Production = 4,000 units
Hours required per unit = 4	Hours = 18,000
OH Rate per hour = Rs. 3.40	Variable Overheads = Rs. 28,500

FIXED OVERHEAD COST VARIANCES

Once again we need to calculate the standard recovery rates as we did in variable OH.

Fixed OH Cost Variance

$$\begin{aligned}
 &= \text{Standard Recovered Overheads on Actual Output} - \text{Actual overheads} \\
 &= (\text{Actual Output} \times \text{SRR/unit}) - \text{Actual overheads} \\
 &= \text{Overheads absorbed} - \text{Overheads incurred}
 \end{aligned}$$

Analysis of Fixed Overhead Cost Variance :

$$\text{i. Expenditure / Budget Variance} = \text{Budgeted Overheads} - \text{Actual Overheads}$$

$$\text{ii. Volume Variance} = \text{SRR/unit} \times (\text{Budgeted Output} - \text{Actual Output})$$

Sub-analysis of Volume Variance :**a. Calendar Variance**

$$= *SRR/\text{day} \times (\text{Budgeted working days} - \text{Actual working days})$$

$$* SRR/\text{day} = \text{Budgeted Overheads} / \text{Budgeted working days}$$

b. Capacity Variance = SRR/hour x (Budgeted Hours - Actual Hours)

Note : If there is a calendar variance, then the budgeted hours shall be calculated w.r.t. actual number of working days for Capacity Variance.

c. Efficiency Variance

$$= SRR/\text{hour} \times (\text{Std. hours for actual output} - \text{Actual hours})$$

Adverse or Favourable :

- (a) In cost variance, if actual overheads are more than standard, then the variance is adverse and if lower then it is favourable.
- (b) In expenditure variance, if actual overheads are more than budgeted, then the variance is adverse and if lower then it is favourable.
- (c) In volume variance, if actual output is more than budgeted, then the variance is favourable and if lower then it is adverse.
- (d) In calendar variance, if actual working days are more than budgeted, then the variance is favourable and if lower then it is adverse.
- (e) In capacity variance, if actual hours are more than budgeted, then the variance is favourable and if lower then it is adverse.
- (f) In efficiency variance, if actual hours are more than standard then the variance is adverse and if lower then it is favourable.

Illustration 4 : The following information is available from the records of a factory :

Particulars	Budget	Actual
Fixed Overheads for June (Rs)	10,000	12,000
Production in June (units)	2,000	2,100
Standard time per unit (hours)	10	
Actual hours worked in June		22,000

Compute -

- i. Fixed Overhead Cost Variance
- ii. Expenditure Variance
- iii. Volume Variance
- iv. Capacity Variance
- v. Efficiency Variance.

Solution :-

Std. rate of recovery per unit (SRR/unit)

$$= \frac{\text{Budget overheads}}{\text{Budget output}} = \frac{\text{Rs. 10,000}}{2,000 \text{ units}} = \text{Rs. 5 per unit}$$

Std. rate of recovery per hr. (SRR/hr.)

$$= \frac{\text{Budget overheads}}{\text{Budgeted hrs.}} = \frac{\text{Rs. 10,000}}{2,000 \times 10} = \text{Rs. 0.50/ hour}$$

Input output ratio = 1 unit requires 10 hrs.

- 1] **Total cost variance** = Std. recovered overheads on actual output - Actual overheads
 = (SRR/unit x Actual output) - Actual overheads.
 = (Rs. 5 x 2,100 units) - Rs. 12,000
 = Rs. 10,500 - Rs. 12,000 = Rs. 1,500 (A).
- 2] **Expenditure variance** = Budget overheads - actual overheads.
 = Rs. 10,000 - Rs. 12,000
 = Rs. 2000 (A)
- 3] **Volume variance** = SRR/unit (Budget output - actual output)
 = Rs. 5 (2,000 units - 2,100 units)
 = Rs. 5 x 100 units = Rs. 500 (F)
- 4] **Capacity variance** = SRR/hr. x (Budgeted hrs. - Actual hrs.)
 = Rs. 0.50 (20,000 hrs. - 22,000 hrs.)
 = Rs. 0.50 x 2,000 hrs. = Rs. 1,000 (F)
- 5] **Efficiency variance** = SRR/hour x (Std. Hours – Actual hours)
 = 0.50 x [(2,100 unit x 10 hrs.) – 22,000]
 = 0.50 x (21,000 – 22,000) = Rs. 500 (A)

Analysis of Fixed Overhead Cost Variances

Total cost Variance = Rs. 1,500 (A)

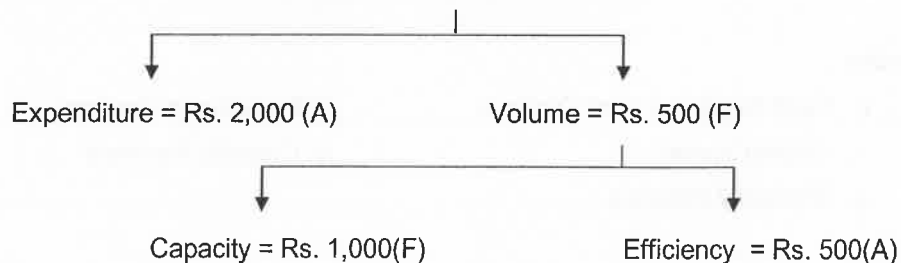


Illustration 5 :

Vinak Ltd., has furnished you the following information for the month of June –

Particulars	Budget	Actual
Output (units)	30,000	32,500
Hours	15,000	16,500
Fixed Overheads (Rs.)	45,000	50,000
Variable Overheads (Rs.)	60,000	68,000
Working Days	25	26

Calculate Variable & Fixed Overhead Cost Variances.

Solution :-

Vinak Ltd.

Calculation of overheads cost variances

Working notes :-

1) Calculation of Overhead Recovery Rates :-

Formula	Variable Overheads	Fixed Overheads
$\text{SRR/Unit} = \frac{\text{Budgeted OH}}{\text{Budgeted Output}}$	$\frac{\text{Rs. 60,000}}{30,000 \text{ Units}} = \text{Rs. 2.00 p.u.}$	$\frac{\text{Rs. 45,000}}{30,000 \text{ Units}} = \text{Rs. 1.50 p.u.}$
$\text{SRR/Hour} = \frac{\text{Budgeted OH}}{\text{Budgeted Hours}}$	$\frac{\text{Rs. 60,000}}{15,000 \text{ hours}} = \text{Rs. 4.00 / hr.}$	$\frac{\text{Rs. 45,000}}{15,000 \text{ hours}} = \text{Rs. 3.00 / hr.}$

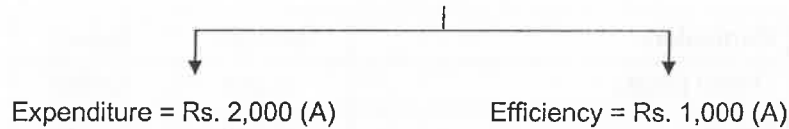
2) Input output Ratio = Budgeted output 30,000 units in budgeted hrs. 15,000 hrs.
Therefore 2 units can be produced in 1 hour

I] Variable overhead cost variances :-

- 1) **Total cost variance** = [SRR /unit (Actual output)] - Actual overheads.
= (Rs. 2 x 32,500 units) - Rs. 68,000 = Rs. 3,000 (A)
- 2) **Expenditure variance** = [SRR / hr. x Actual hrs.] - Actual overheads
= [Rs. 4 x 16,500 hrs.] - Rs. 68,000
= Rs. 66,000 - Rs. 68,000 = Rs. 2,000 (A)
- 3) **Efficiency variance** = SRR/hour x (Std. Hours – Actual hours)
= 4 x [(32,500 / 2) – 16,500]
= 4 x (16,250 – 16,500) = Rs. 1,000 (A)

Analysis of Variable OH

Total cost Variance = Rs. 3,000 (A)



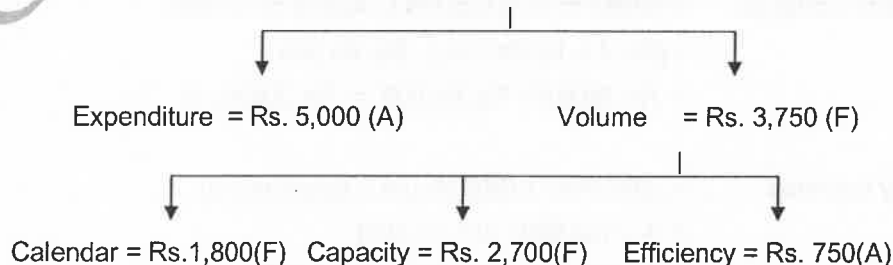
II] Fixed overhead cost variances :-

- 1) **Total cost variance** = (Actual output x SRR p.u.) - Actual overheads.
 = (32,500 units x Rs. 1.50) - Rs. 50,000
 = Rs. 48,750 - Rs. 50,000 = Rs. 1,250 (A)
- 2) **Expenditure variance** = (Budgeted overheads - Actual overheads)
 = Rs. 45,000 - Rs. 50,000 = Rs. 5,000 (A)
- 3) **Volume variance** = SRR / unit x (Budgeted output - Actual output)
 = Rs. 1.50 (30,000 units - 32,500 units)
 = Rs. 1.50 x 2,500 units = Rs. 3,750 (F)
- 4) **Calendar variance** = Std. overheads per day x (Budget days - Actual days)

$$= \frac{\text{Rs. 45,000}}{25 \text{ days}} \times (25 \text{ days} - 26 \text{ days}) = \text{Rs. 1,800 (F)}$$
- 5) **Capacity variance** = SRR / hr x (Budgeted hrs. for actual working days - Actual hrs)
 = Rs. 3 [(15,000 hrs. x 26 days/25 days) - 16,500 hrs.]
 = Rs. 3 (15,600 hrs. - 16,500 hrs.) = Rs. 2,700 (F).
- 6) **Efficiency variance** = SRR/hour x (Std. Hours – Actual hours)
 = 3 x [(32,500 / 2) – 16,500]
 = 3 x (16,250 – 16,500) = Rs. 750 (A)

Analysis of Fixed OH Variance

Total cost Variance = Rs. 1,250 (A)



Practical Questions on Fixed OH Cost Variance
--

PROBLEM NO. 13

SV Limited has furnished the following data –

Particulars	Budget	Actual
No. of working days	25	27
Production in units	20,000	22,000
Fixed Overheads	30,000	31,000

Budgeted fixed overhead rate is Rs.1 per hour. In July, the actual hours worked were 31,500.

Calculate the following variance -

- | | |
|-------------------------|----------------------------|
| 1. Efficiency Variance | 2. Capacity Variance |
| 3. Calendar Variance | 4. Volume Variance |
| 5. Expenditure Variance | 6. Total Overhead Variance |

PROBLEM NO. 14

In a factory the standard units of production for the year were fixed at 1,20,000 units and estimated overhead expenditure were to be –

Fixed ... Rs.12,000 Variable ... Rs. 6,000 Semi-variable ... Rs.1,800

Actual production during April of the year was 8,000 units. Each month has 20 working days.

During the month in question there was one extra holiday. The actual overheads amounted to –

Fixed ... Rs.1,190 Variable ... Rs. 480 Semi-variable ... Rs.192

Semi-variable charges are considered to include 60% expenses of fixed nature and 40% of variable character. Find out the Expenditure, Volume and Calendar Variances.

PROBLEM NO. 15

From the following data, compute overhead variance –

Particulars	Budget	Actual
Output (kgs)	25,000	31,000
Man-hours per day	800	1,000
No. of days	25	26
Fixed Overheads	Rs.37,500	Rs.38,000

PROBLEM NO. 16

From the following information, calculate fixed overhead variances –

Particulars	Budget	Actual
Output (units)	12,500	13,400
Capacity (hours per day)	8,000	8,800
Number of days working	25	26
Fixed Overheads (Rs.)	1,25,000	1,30,000

PROBLEM NO. 17

From the following data, analyse fixed and variable overhead cost variances –

Particulars	Budget	Actual
Production	4,000 units	3,800 units
Working days	20	21
Fixed Overhead	Rs.40,000	Rs.39,000
Variable Overheads	Rs.12,000	Rs.12,000
Hours	8,000	7,000

PROBLEM NO. 18

Ravi, Richard, Rahim and Roop Singh are regional salesmen distributing the product of Super Perfumes Ltd. The selling price of the product is Rs. 400 per unit. The sales quota and the standard selling expenses for the year are :

Salesmen	Sales Quota (Rs.)	Std. selling exp. (Rs.)
Ravi	7,50,000	2,25,000
Richard	9,00,000	2,47,500
Rahim	11,50,000	2,87,500
Roop Singh	6,00,000	2,25,000

Actual data for the year were as follows :

Particulars	Ravi	Richard	Rahim	Roop Singh
Days on field work	200	175	225	250
Kilometres covered	20,000	18,000	18,000	30,000
	Rs.	Rs.	Rs.	Rs.
Sales	8,00,000	10,00,000	10,50,000	5,20,000
Salary	80,000	80,000	80,000	80,000
Free samples	9,000	7,500	5,375	8,000
Postage & stationery	8,000	9,000	10,000	6,000
Other expenses	9,000	5,000	4,000	10,000

The salesmen are given conveyance allowance of Rs. 1.50 per kilometer and a daily allowance of Rs. 80 per day for the days spent on field work. Ravi, a senior salesman gets a commission of 6% on sales and others are given a commission of 5% on sales. Corporate sales office expenses are chargeable at the rate of Rs. 30 per unit sold in the case of Ravi and Richard and Rs. 40 per unit in the case of Rahim and Roop Singh.

Prepare a schedule showing the selling cost variance for each salesman.

PROBLEM NO. 19

A Cost Accountant of a Company was given the following information regarding the overheads.

- Overhead Cost Variance Rs.1,400 adverse
- Overhead Volume Variance Rs.1,000 adverse
- Budgeted Hours for February, 2003 1,200 hours
- Budgeted Overheads for February, 2003 Rs.6,000
- Actual Rate of recovery of overheads Rs. 8 per hour.

You are required to assist him in computing the following -

- Overhead Expenditure Variance
- Actual Overheads Incurred
- Actual hours for Actual Production
- Overheads Capacity Variance
- Overheads Efficiency Variance
- Standard hours for Actual Production

Question 20 : [Nov. 2018 Exam]

Apple Ltd., is following three variances method to analyse and understand production overhead variances. The three variances for a particular year were reported as given below :

Production overhead expenditure variance	₹ 94,000 (A)
Production overhead volume variance	₹ 1,00,000 (F)
Production overhead efficiency variance	₹ 48,000 (F)

The other particulars furnished from the records of the company are :

Standard machine hours for the year	11,500
Closing balance in the production overhead control account	₹ 18,00,000
Fixed overhead rate per hour	₹ 125
Variable overhead rate per hour	₹ 80

Required :

Compute the following by considering the additional information also :

- Actual machine hours
- Budgeted machine hours
- Total Fixed Production Overhead amount
- Applied Production Overhead amount

Additional Information :

- Expenditure variance was computed totally for fixed and variable overheads.
- Volume variance is applicable to fixed overhead only.
- Efficiency variance is applicable only to variable overhead and fixed overhead efficiency variance was already included in volume variance.

Practical Questions - All in One

PROBLEM NO. 21

A company produces Single Product from Single Material. It operates a standard cost system and furnishes you the following information –

PARTICULARS	BUDGET	ACTUAL
Product Units	8,000	6,000
Materials -		
Total Quantity - kg	16,000	13,000
Total Amount - Rs.	32,000	27,300
Labour -		
Total Hours	2,400	2,000
Total Amount - Rs.	3,000	3,000
Variable Overheads		
Total Hours	2,400	2,000
Total Amount - Rs.	2,400	2,200

You are required to compute the following variance –

- | | |
|---------------------------------|-------------------------------|
| a. Material Price Variance | b. Material Usage Variance |
| c. Labour Rate Variance | d. Labour Efficiency Variance |
| e. Overhead Efficiency Variance | f. Overhead Budget Variance |

PROBLEM NO. 22

The following standards have been set to manufacture a product –

Particulars	Rs.
Direct Materials :	
2 Units of A at Rs.4 per unit	8.00
3 Units of B at Rs.3 per unit	9.00
15 Units of C at Re.1 per unit	15.00
Direct Labour 3 hours at Rs.8 per hr.	24.00
Total Standard Prime Cost	56.00

The company manufactured and sold 6,000 units of the product during the year. Direct Material Cost were as follows:

- 12,500 Units of A at Rs.4.40 per unit
- 18,000 Units of B at Rs.2.80 per unit
- 88,500 Units of C at Rs.1.20 per unit

The company worked 17,500 direct labour hours during the year. For 2,500 of these hours the company paid at Rs.12 per hour while for the remaining the wages were paid at the standard rate.

Calculate Material Price and Usage Variances and Labour Rate and Efficiency Variances.

PROBLEM NO. 23 :

A standard costing system is adopted in Machine Shop which is fabricating components for Refrigerators. The following is the composition of the standard machine hour rate –

	Rs.
Direct Labour @ Rs. 2 per hour	2.00
Variable Overheads @ Rs. 4 per hour	4.00

All machines are identical in the shop. The above rates have been worked out on the basis of 2,60,000 machine hours per annum consisting of 52 weeks. In a particular week the following components were produced.

Button Toys .. 500 Nos.; Door Panels .. 800 Nos. and Side Panels .. 600 Nos.

The standard time allowed for the above items are 1, 4 and 2 hours per unit respectively. During the week, actual labour and overhead costs incurred are –

Direct Labour	Rs. 11,000 @ Rs. 2 per hour
Variable Overheads	Rs. 23,000

You are required to work out the various labour and overhead cost variances for week.

PROBLEM NO. 24

The standard Cost Sheet per unit for the product produced by the Modern Manufacturers is worked out on this basis -

Direct Materials	1.3 kgs. @ Rs. 4.00 per kg.
Direct Labour	2.9 hours @ Rs. 2.30 per hour.
Factory Overheads	2.9 hours @ Rs. 2.00 per hour
Normal Capacity is	2,00,000 direct labour hours per month.

The factory overhead rate is arrived at on the basis of a Fixed Overhead of Rs.1,00,000 per month and a Variable Overhead of Rs. 1.50 per direct labour hour.

In the month of May, 50,000 units of the product was started and completed. An investigation of the raw material inventory account reveals that 78,000 kgs. of raw materials were transferred into and used by the factory during the May. These goods cost Rs.4.20 per kg.

1,50,000 direct labour hours were spent during May at a cost of Rs.2.50 per hour.

Factory overheads for the month amounted to Rs. 3,40,000 out of which Rs.1,02,000 was fixed.

Compute and identify all variances under Materials, Labour and Overheads as favourable or adverse.

SALES VARIANCES (REVENUE VARIANCE)

$$\begin{aligned}\text{Total Sales Value Variance} &= \text{Budgeted Sales} - \text{Actual Sales} \\ &= (BQ \times SSP) - (AQ \times ASP)\end{aligned}$$

Where, Budgeted Sales = Budgeted Quantity x Std. Selling Price
and Actual Sales = Actual Quantity sold x Actual Selling Price

Analysis of Sales Variance :

- i. **Sales Price Variance** = Actual Qty. x (Std. Selling price - Actual Selling Price)
- ii. **Sales Volume Variance** = Std. S.P. x (Budgeted Qty.- Actual Qty.)

Sub-analysis of Sales Volume Variance :

- i. **Sales Mix Variance** = Std. S.P. x (Std.Mix** - Actual Mix*)
 * Actual Mix = Actual quantity sold and
 ** Std. Mix = Total actual quantity sold revised in standard proportion.
- ii. **Sales Quantity Variance** = Std. Selling Price x (Budgeted Qty. - Std. Mix)

Note : In case of sales variances, budgeted data and standard data means one and the same. These two words are used interchangeably for sales.

That is, Budgeted Qty. = Standard Qty.
 Budgeted Selling Price = Standard Selling Price and
 Budgeted Sales = Standard Sales

Adverse or Favourable :

- (a) In sales variance, if actual sales are more than budgeted, then the variance is favourable and if lower then it is adverse. This is because, now we are studying the revenue variances and actual revenue more is better. For cost variances, actual cost lower is better.
- (b) In sales price variance, if actual price is more than standard, then the variance is favourable and if lower then it is adverse.
- (c) In volume variance, if actual quantity sold is more than budgeted, then the variance is favourable and if lower then it is adverse.
- (d) In mix variance, if actual mix is more than standard, then the variance is favourable and if lower then it is adverse.
- (e) In quantity variance, if std. mix is more than budgeted quantity, then the variance is favourable and if lower then it is adverse. This is because, std. mix is calculated from actual quantity sold.

Illustration 6 :

PH Limited furnished the following information relating to budgeted sales and actual sales for April. Calculate the sales variances.

Particulars	Product	Sales Qty	Selling Price p. u.
		units	Rs.
Budgeted Sales	A	1200	15
	B	800	20
	C	2000	40
Actual Sales	A	880	18
	B	880	20
	C	2640	38

Solution :**PH Ltd. - Calculation of Sales Variances**

- 1] Total sales variance = Budgeted Sales - Actual sales
 = (Budgeted Qty. x Std. selling price p.u.) - (Actual Qty. x Actual S.P.)

Product	Budgeted Sales (Rs.)		Actual sales (Rs.)		Variance
A	(1200 units x Rs. 15)	18,000	(880 units x Rs. 18)	15,840	2,160 (A)
B	(800 units x Rs. 20)	16,000	(880 units x Rs. 20)	17,600	1,600 (F)
C	(2000 units x Rs. 40)	80,000	(2640 units x Rs. 38)	1,00,320	20,320 (F)
	Total	1,14,000	Total	1,33,760	19,760 (F)

- 2] Sales Price Variance = Actual Qty. x (Std. S.P. - Actual S.P.)
- A = 880 units (Rs. 15 - Rs. 18) = Rs. 2640 (F)
- B = 880 units (Rs. 20 - Rs. 20) = NIL
- C = 2640 units (Rs. 40 - Rs. 38) = Rs. 5280 (A)
- Total Rs. 2640 (A)
- 3] Sales Volume Variance = Std. selling price x (Budgeted qty. - Actual qty.)
- A = Rs. 15 (1200 units - 880 units) = Rs. 4,800 (A)
- B = Rs. 20 (800 units - 880 units) = Rs. 1,600 (F)
- C = Rs. 40 (2000 units - 2640 units) = Rs. 25,600 (F)
- Total Rs. 22,400 (F)

4] Sales Mix Variance = Std. Selling price x (Std. mix - Actual mix)

Product	Std. S.P.	Calculation	*Std. mix	Actual mix	Variance
		Rs.	Units	Units	Rs.
A	15	4400 x 3/10	1320	880	6,600 (A)
B	20	4400 x 2/10	880	880	NIL
C	40	4400 x 5/10	2200	2640	17,600 (F)
Total		*(3 : 2 : 5)	4400	4400	11,000 (F)

5] Sales Qty. Variance = Std. S.P. x (Budgeted Qty. - Std. Mix)

A = Rs. 15 (1200 units - 1320 units) = Rs. 1800 (F)

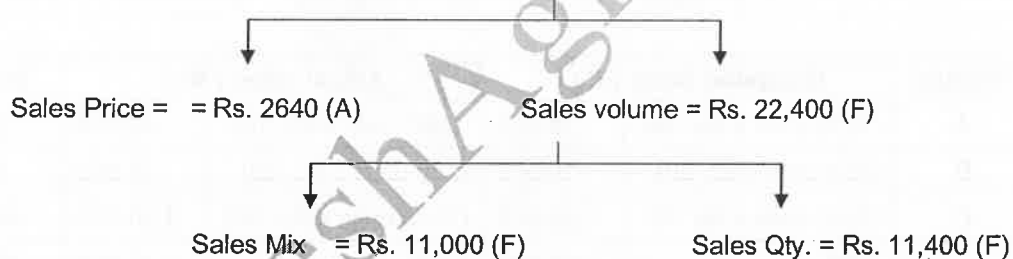
B = Rs. 20 (800 units - 880 units) = Rs. 1600 (F)

C = Rs. 40 (2000 units - 2200 units) = Rs. 8000 (F)

Total Rs. 11400 (F)

Analysis of Sales Variance

Total Sales Variance = Rs. 19,760 (F)



Practical Questions on Sales Variance

PROBLEM NO. 25

Calculate sales variances from the following data –

Particulars		Product A	Product B
Budgeted Quantity	(units)	8,000	12,000
Budgeted Selling Price	(Rs./unit)	12	8
Actual Quantity sold	(units)	9,000	6,000
Actual Selling Price	(Rs./unit)	11	10

PROBLEM NO. 26

Compute the missing data indicated by the question marks from the following -

Particulars	Product - R	Product - S
Sales Quantity :		
Standard (units)	?	400
Actual (units)	500	?
Price / unit :		
Standard (Rs.)	12	15
Actual (Rs.)	15	20
Sales Price Variance	?	?
Sales Volume Variance (Rs.)	1,200 F	?
Sales Value Variance	?	?

Sales Mix Variance for both the products together was Rs. 450 (F).

PROFIT VARIANCES

Profit Variance = Budgeted Profit – Actual Profit

= (Budgeted Qty. x Std. Profit per unit) – (Actual Qty. x Actual Profit per unit)

Standard Profit per unit = Std. Selling Price – Std. Cost price

Actual Profit per unit = Actual Selling Price – Actual Cost price

Analysis of Profit Variance :

i. Sales Price Variance = Actual Qty. sold x (Std. S.P. - Actual S.P.)

ii. Cost Price Variance = Actual Qty. sold x (Std. Cost price - Actual Cost price)

iii. Profit Volume Variance = Std. Profit/unit x (Budgeted Qty. - Actual Qty.)
--

Sub - Analysis of Profit Volume Variance :

i. Profit Mix Variance = Std. Profit/unit x (Std. Mix** – Actual Mix*)

* Actual mix = actual quantity sold and

** Std. mix = Total actual quantity sold revised in standard proportion.

ii. Profit Quantity Variance = Std. Profit/unit x (Budgeted Qty. – Std. Mix)

Adverse or Favourable :

- (a) In profit variance, if actual profit is more than budgeted, then the variance is favourable and if lower then it is adverse.
- (b) In sales price variance, if actual sales price is more than standard, then the variance is favourable and if lower then it is adverse.
- (c) In cost price variance, if actual cost price is more than standard, then the variance is adverse, and if lower then it is favourable. Because cost lower is better.
- (d) In profit volume variance, if actual quantity sold is more than budgeted, then the variance is favourable and if lower then it is adverse.
- (e) In mix variance, if actual mix is more than standard, then the variance is favourable and if lower then it is adverse.
- (f) In quantity variance, if std. mix is more than budgeted quantity, then the variance is favourable and if lower then it is adverse. This is because, std. mix is calculated from actual quantity sold.

NOTES :

1. Profit variances may also be analysed on the basis of difference between standard profit and actual profit instead of difference between budgeted profit and actual profit. However, the budgeted profit and actual profit analysis is broader and includes the analysis of standard profit minus actual profit also.
2. Sometimes, in the examination you may be asked to calculate the sales margin variance. Sales margin means profit per unit only. Means, you have to calculate profit variances only.
3. Sometimes Institute uses contribution approach for profit variances. In such case, you have to substitute the standard profit per unit by standard contribution margin per unit. This is known as Marginal Costing Approach. It may be called as Contribution Margin Variance OR Gross Sales Margin Variance.

Illustration 7 :

Polester Electronics Limited furnished the following details regarding actual and budgeted sales, costs and profits for May. Calculate Sales and Profit Variances.

Product	SALES			COST		PROFIT	
	Qty.	Rate	Amt.	Rate	Amt.	Rate	Amt.
Actual	units	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
P	8,000	11	88,000	10	80,000	1	8,000
Q	6,000	12	72,000	6	36,000	6	36,000
Total	14,000		1,60,000		1,16,000		44,000
Budgeted							
P	10,000	15	1,50,000	10	1,00,000	5	50,000
Q	5,000	10	50,000	6	30,000	4	20,000
Total	15,000		2,00,000		1,30,000		70,000

Solution :-

Sales Variances

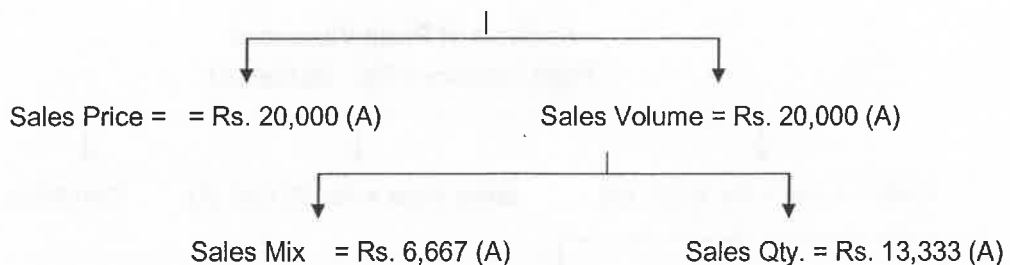
- 1] **Total Sales Variance** = Budgeted Sales – Actual Sales
- | | | |
|-------|-------------------------------|---------------|
| P | = Rs. 1,50,000 - Rs. 88,000 = | Rs. 62,000(A) |
| Q | = Rs. 50,000 - Rs. 72,000 = | Rs. 22,000(F) |
| Total | | Rs. 40,000(A) |
- 2] **Selling price variance** = Actual qty. sold x (Std. S.P. – Actual S.P.)
- | | | |
|-------|-----------------------------------|----------------|
| P | = 8,000 units (Rs. 15 - Rs. 11) = | Rs. 32,000(A) |
| Q | = 6,000 units (Rs. 10 - Rs. 12) = | Rs. 12,000(F) |
| Total | | Rs. 20,000 (A) |
- 3] **Sales volume variance** = Std. S.P. x (Budgeted qty. – Actual qty.)
- | | | |
|-------|---------------------------------------|----------------|
| P | = Rs. 15 (10000 units - 8000 units) = | Rs. 30,000 (A) |
| Q | = Rs. 10 (5000 units - 6000 units) = | Rs. 10,000 (F) |
| Total | | Rs. 20,000 (A) |
- 4] **Sales Mix variance** = Std. S.P. x (Std. mix - Actual mix)

Product	Std. S.P. Rs.	Calculation	*Std. Mix Units	Actual mix Units	Variance Rs.
P	15	14,000 x 2/3	9,333.33	8,000	20,000 (A)
Q	10	14,000 x 1/3	4,666.67	6,000	13,333 (F)
Total	* Std. mix ratio is 2 : 1.		14,000	14,000	6,667 (A)

- 5] **Sales Quantity Variance** = Std. price (Budgeted Qty. - Std. Mix)
- | | | |
|-------|--|----------------|
| P | = Rs. 15 (10,000 units - 9,333.33 units) = | Rs.10,000 (A) |
| Q | = Rs. 10 (5,000 units - 4,666.67 units) = | Rs. 3,333 (A) |
| Total | | Rs. 13,333 (A) |

Analysis of Sales Variance

Total Sales Variance = Rs. 40,000 (A)



Profit Variances

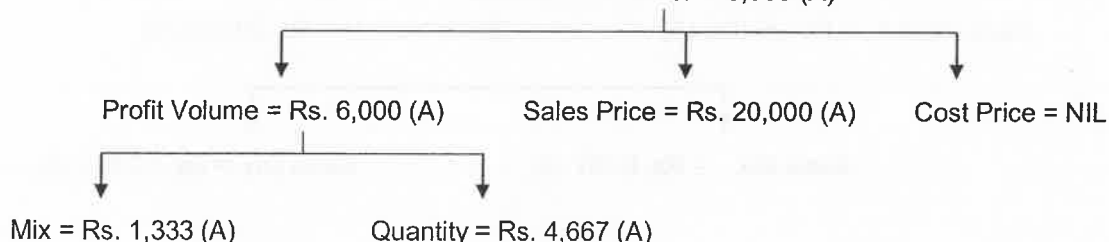
- 1) **Total profit variance** = Budgeted profit - Actual profit
- P = Rs. 50,000 - Rs. 8,000 = Rs. 42,000 (A)
- Q = Rs. 20,000 - Rs. 36,000 = Rs. 16,000 (F)
- Total = Rs. 26,000 (A)
- 2) **Sales price variance** = Actual qty. x (Std. S.P. - Actual S.P.)
- P = 8,000 units (Rs. 15 - Rs. 11) = Rs. 32,000 (A)
- Q = 6,000 units (Rs. 10 - Rs. 12) = Rs. 12,000 (F)
- Total = Rs. 20,000 (A)
- 3) **Profit volume variance** = Std. profit p.u. x (Budgeted Qty. - Actual Qty.)
- P = Rs. 5(10,000 units - 8,000 units) = Rs. 10,000 (A)
- Q = Rs. 4(5,000 units - 6,000 units) = Rs. 4,000 (F)
- Total = Rs. 6,000 (A)
- 4) **Cost price variance** = Actual qty. x (Std. cost - Actual cost)
- P = 8,000 units (Rs. 10 - Rs. 10) = NIL
- Q = 6,000 units (Rs. 6 - Rs. 6) = NIL
- Total = NIL
- 5) **Profit Mix Variance** = Std. profit p.u. x (Std. mix - Actual mix)

Product	Std. profit p.u. Rs.	Calculation Units	Std. mix Units	Actual mix	Variance Rs.
P	5	14,000 x 2/3	9,333	8,000	6,665 (A)
Q	4	14,000 x 1/3	4,667	6,000	5,332 (F)
Total			14,000	14,000	1,333 (A)

- 6) **Profit Quantity Variance** = Std. profit (Bud. Qty. - Std. mix)
- P = Rs. 5 (10,000 units - 9,333 units) = Rs. 3,335 (A)
- Q = Rs. 4 (5,000 units - 4,667 units) = Rs. 1,332 (A)
- Total = Rs. 4,667 (A)

Analysis of Profit Variances

Profit Variance = Rs. 26,000 (A)



MARKET SIZE AND MARKET SHARE VARIANCES

Introduction :

Market size means the total demand in the market for a particular product or service. For example, if total number of two wheelers sold in India during the calendar year 2017 are 20 lakh vehicles, then the total market size of two wheeler market is 20,00,000.

Out of these 20 lakh vehicles, if Hero Motorcycles Ltd. is able to sell 5,00,000 vehicles, then the market share of HML is 25%. i.e. 5 lakh out of 20 lakh.

The overall size of the market is generally influenced by various factors which are beyond the control of the management of a company. These are known as external factors or uncontrollable factors.

However, the market share of a company is generally influenced by the internal factors, which are within the control of the management of a company. These are known as internal factors or controllable factors.

Any change in these external or internal factors will have the impact on the sales and profitability of the company. This impact is measured by two variances known as Market Size Variance and Market Share Variance.

(a) Market Size Variance :

[Also called as Planning Variance or Uncontrollable Variance]

$$= \text{Std. Profit p.u.} \times [\text{Budgeted share} \times (\text{Budgeted Market size} - \text{Actual market size})]$$

$$= \text{Std. Profit p.u.} \times [\text{Budgeted Quantity} - \text{Budgeted share in Actual market size}]$$

(b) Market Share Variance :

[Also called as Operational Variance or Controllable Variance]

$$= \text{Std. profit p.u.} \times [\text{Actual market size} \times (\text{Budgeted Market share} - \text{Actual market share})]$$

$$= \text{Std. Profit p.u.} \times [\text{Budgeted share in Actual market size} - \text{Actual Quantity sold}]$$

Note 1 : The above variances shall indicate the impact of market size and market share on the profits of the company. However, if management is interested in knowing the impact on sales value, then one has to substitute standard profit per unit by standard selling price per unit in the above formulae. It is another way of analysing the Profit Volume or Sales Volume variance.

Note 2 : For Market Size variance, external factors are responsible and for Market Share variance, internal factors are responsible. Hence, market size variance is called uncontrollable variance and market share variance is known as controllable variance.

Note 3 : In case of multiple products, Volume Variance is first analysed in to Mix Variance & Quantity Variance. Then you need to analyse Sales Quantity or Profit Quantity Variance in two parts : i.e. (a) Market Size Variance and (b) Market Share Variance.

Illustration 8 :

Colgate Ltd. had estimated a market size for toothpaste market in the coming year as 50 lakhs tubes with a 60% market share. It's estimated profit per tube is Rs. 8 on an estimated selling price of Rs. 40. At the end of the year, the actual data revealed that – total toothpaste tubes sold in the market were 62 lakhs, out of which Colgate Ltd. could manage to sell only 32 lakhs tubes. You are required to calculate –

- | | |
|---------------------------|----------------------------|
| (a) Sales Volume Variance | (b) Profit Volume Variance |
| (c) Market Size Variance | (d) Market Share Variance |

Solution :

(a) **Sales Volume Variance** = Std. Selling price p.u. (Budgeted Qty. – Actual Qty.)
 = Rs. 40 x [(50 lakhs x 60%) – 32 lakh]
 = Rs. 40 x [30 – 32 lakhs tubes] = Rs. 80 lakhs (F)

(b) **Profit Volume Variance** = Std. Profit p.u. (Budgeted Qty. – Actual Qty.)
 = Rs. 8 x [(50 lakh x 60%) – 32 lakh]
 = Rs. 8 x [30 – 32 lakh tubes] = Rs. 16 lakhs (F)

(c) Market Size Variance :

= Std. Profit p.u. x [Budgeted share (Budgeted Market size – Actual market size)]
 = Std. Profit p.u. x [Budgeted Quantity – Budgeted share in Actual market size]
 = Rs. 8 [30 lakhs – (60% x 62 lakhs)]
 = Rs. 8 [30 lakhs – 37.2 lakhs] = Rs. 57.6 lakhs (F) is Profit Impact

OR

= Std. Selling Price p.u. [Budgeted share (Budgeted Market size – Actual market size)]
 = Std. Selling Price p.u. [Budgeted Quantity – Budgeted share in Actual market size]
 = Rs. 40 [30 lakhs – (60% x 62 lakhs)]
 = Rs. 40 [30 lakhs – 37.2 lakhs] = Rs. 288 lakhs (F) is Sales Value Impact

(d) Market Share Variance :

= Std. Profit p.u. [Actual market size (Budgeted Market share – Actual market share)]
 = Std. Profit p.u. [Budgeted share in Actual market size – Actual Quantity sold]
 = Rs. 8 [(60% x 62 lakhs) – 32 lakhs]
 = Rs. 8 [37.2 lakhs – 32 lakhs] = Rs. 41.6 lakhs (A) is Profit Impact

OR

= Std. Selling Price p.u. [Budgeted share in Actual market size – Actual Quantity sold]
 = Rs. 40 [(60% x 62 lakhs) – 32 lakhs]
 = Rs. 40 [37.2 lakhs – 32 lakhs] = Rs. 208 lakhs (A) is Sales Value Impact

PROBLEM NO. 27

Total market size of cars in India for the year 2016 was 5,00,000 nos. at an average selling price of Rs. 2.5 lakh per car. The std. profit per car is Rs. 20,000. Maruti Ltd. sold 3,00,000 cars in the year 2016.

It was budgeted for the year 2017, that there will be increase in market size by 20% and increase in market share of Maruti Ltd. by 10%. Selling price and profit per car shall remain same.

Actual data for the year 2017 reveals that : Total no. of cars sold in India were 6,50,000 units and no. of cars sold by Maruti Ltd. were 4,00,000 units.

Calculate for 2017 -

- 1) Market size variance
- 2) Market share variance.
- 3) Sales Volume Variance
- 4) Profit Volume Variance

PROBLEM NO. 28

From the following information, calculate and analyze the sales variances including controllable and uncontrollable variance for Indigo Airlines.

Particulars	Budget	Actual
Total no. of passengers travelling by air	10,00,000	12,00,000
Passengers travelling by Indigo Airlines	3,00,000	3,84,000
Average air fare of Indigo	3,000	3,300

RECONCILIATION OF PROFIT – ABSORPTION COSTING APPROACH

Introduction :

Management of the company is interested in knowing the reasons for variation in budgeted profit and actual profit. For example – if a company had planned to earn a profit of Rs. 25,00,000 for the next month and the actual profit earned during that month was Rs. 22,00,000; then one must know the reasons for not achieving the target profit. So that, we can take corrective steps in the next period.

However, the analysis of profit variance is presented in a format for better understanding of the management. This statement of variances is popularly known as Reconciliation of Profit. It can be presented using two approaches : (a) Absorption costing approach and (b) Marginal costing approach.

Note : Reconciliation between Budgeted Profit and Actual Profit includes the reconciliation between Standard Profit and Actual Profit also.

Reconciliation Statement – Budgeted Profit with Actual Profit :

Particulars	Rs.	Rs.	Rs.
Budgeted Profit (Bud. Qty. x Std. Profit p.u.)			xxx
Profit Volume Variance [Also called as sales margin volume variance]			xxx
∴ Standard Profit expected from actual quantity sold [Actual Qty. sold x Std. Profit p.u.]			xxx
Sales Price Variance [sales margin price variance]			xxx
Material Cost Variance :			
Material Price Variance		xxx	
Material Usage Variance –			
Material Mix Variance	xxx		
Material Sub-usage / Yield Variance	xxx	xxx	xxx
Labour Cost Variance :			
Labour Rate Variance		xxx	
Labour Efficiency Variance –			
Labour Mix Variance	xxx		
Labour Idle Time Variance	xxx		
Labour Sub-efficiency Variance	xxx	xxx	xxx
Variable OH Cost Variance :			
Variable OH Expenditure Variance		xxx	
Variable OH Efficiency Variance		xxx	xxx
Fixed OH Cost Variance :			
Fixed OH Expenditure Variance		xxx	
Fixed OH Volume Variance –			
Fixed OH Calendar Variance	xxx		
Fixed OH Capacity Variance	xxx		
Fixed OH Efficiency Variance	xxx	xxx	xxx
Actual Profit (Actual Qty. Sold x Actual Profit p.u.)			xxx

PROBLEM NO. 29

Jumbo Enterprises manufactures one product, and the entire product is sold as soon as it is produced. There is no opening or closing stock and work in progress is negligible. The company operates a standard costing system and analysis of variances is made every month. The standard cost card for the product is as follows –

Particulars		Rs./unit
Direct Materials	0.5 kgs. at Rs.4 per kg.	2.00
Direct Wages	2 hours at Rs.2 per hour	4.00
Variable OHs	2 hours at Rs.0.30 per hour	0.60
Fixed OHs	2 hours at Rs.3.70 per hour	7.40

Standard Cost		14.00
Standard Profit		6.00
Standard Selling Price		20.00

Budgeted production and sales = 5,100 units

Actual results for April were as follows –

- Production of 4,850 units and it was sold for Rs. 95,600.
- Materials consumed in production amounted to 2,300 kg. at a total cost of Rs. 9,800.
- Labour hours paid amounted to 8,500 hours at a cost of Rs. 16,800.
- Variable overheads amounted to Rs. 2,600.
- Fixed overheads amounted to Rs. 42,300.

You are required to :-

- Calculate variances due to all possible causes.
- Prepare a statement for the month of April, reconciling budgeted profit with actual profit.

PROBLEM NO. 30

A company is operating on a standard costing system. The budget for a four week period was to sale 10,000 units at Rs. 50 per unit. Actual sale for the same period was 9,000 units at Rs.51.25 per unit. Costs relating to that period were as follows –

Particulars	Budget	Actual
Materials	2,50,000	2,57,400
Wages	75,000	70,875
Fixed Overheads	20,000	18,810
Variable Overheads	10,000	9,250
Semi-variable Overheads	2,700	2,430
Labour Hours	50,000	40,500

- The standard material content of each unit is estimated at 25 kg. at Re.1 per kg. Actual figures were 26 kg. at Rs. 1.10 per kg.
- The standard wages per unit are 5 hours at Rs. 1.50 per hour, actual wages were 4.5 hours at Rs. 1.75.
- Semi-variable Overheads consists of five ninths fixed expenses and four ninth variable.

You are required to -

- To compute the variances in Sales, Materials, Labour and Overheads due to all possible causes, and
- With the help of such a computation draw a statement reconciling the actual profit for the period with the budgeted profit.

PROBLEM NO. 31

ABC Limited adopted a standard costing system. The budgeted output for a period is 20,000 units and the standard cost and profit per unit is as under –

Particulars	Rs.
Direct Materials (3 units @ Rs.1.50)	4.50
Direct Labour (3 hours @ Rs.1.00)	3.00
Direct Expenses	0.50
Factory Overheads - Variable	0.25
- Fixed	0.30
Administrative Overheads	0.30
Total Cost	8.85
Profit	1.15
Selling Price (fixed by Government)	10.00

The actual production and sales for a period was 14,400 units. There has been no price revision by the Government during the period. The following are the variances worked out at the end of the period:

Particulars	Favourable Rs.	Adverse Rs.
Direct Materials - Price	-	4,250
- Usage	1,050	-
Direct Labour - Rate	-	4,000
- Efficiency	3,200	-
Variable Factory OH - Expenditure	400	-
- Efficiency	400	-
Fixed Factory OH - Expenditure	400	-
- Volume	-	1,680
Fixed Admin. OH - Expenditure	-	400
- Volume	-	1,680

You are required to :-

- Ascertain the details of actual costs and prepare a statement showing actual Profit/Loss.
- Calculate budgeted profit and
- Reconcile the actual profit with budgeted profit.

PROBLEM NO. 32

The budgeted output of a single product manufacturing company was 5,000 units. The financial results in respect of the actual output of 4,800 units achieved during the year were as under –

Particulars	Rs.
Direct Materials	29,700
Direct Wages	44,700
Variable Overheads	72,750
Fixed Overheads	39,000
Profit	36,600
Sales	2,22,750

The cost accounts recorded the following variances for the year –

Variances	Favourable (Rs.)	Adverse (Rs.)
Material Price	—	300
Material Usage	—	600
Wage Rate	750	—
Labour Efficiency	—	2,250
Variable Overhead Expense	3,000	—
Variable Overhead Efficiency	—	3,750
Fixed Overhead Expense	—	1,500
Selling Price	6,750	—

You are required to :

- Prepare a statement showing the original budget.
- Prepare the standard product cost sheet per unit.
- Prepare a statement showing the reconciliation of originally budgeted profit and the actual profit.

PROBLEM NO. 33

You are appointed as a Cost Accountant of Zed Ltd. Given below is the company's operating report for March.

Particulars	Standard and Variances (Rs.)	Actual (Rs.)
Sales - Budgeted	18,000	
Variances due to -		
Volume of orders	1,000	
Selling Prices	400	19,400
Profit - Budgeted	3,800	
Variances due to -		
Sales Volume (Profit volume)	240	
Sales Price	400	4,440
Production Cost Variance -		
Labour - Rate	(250)	
Efficiency	(100)	(350)
Material - Price	150	
Usage	(60)	90
Overhead -		
Expenditure (Fixed)	100	
(Variable)	(250)	
Efficiency (fixed + variable)	200	
Capacity (fixed)	100	150
Operating Profit		4,330

Your assistant provides the following information about sales and costs for April –

Sales	Budgeted	Sales Value	Actual	Sales Value
	Units	(Rs)	Units	(Rs.)
Product A	250	10,000	280	10,800
Product B	200	6,000	190	5,500
Product C	150	3,000	180	3,500
Total		19,000		19,800

Product	Std. Selling Price p.u.	Std. Product Cost p.u.	Std. Profit p.u.
	Rs.	Rs.	Rs.
A	40	31	9
B	30	25	5
C	20	15	5

Other relevant information :	
Labour - Standard labour rate per hour	Rs. 0.90
Budgeted hours	4,000
Actual clocked hours	4,400
Standard hours	4,500
Actual labour cost	Rs. 4,260
	Rs.
Materials - Standard cost of materials actually used	5,230
Standard cost of material allowed	5,330
Actual cost of materials used	5,430
Overheads - Budgeted overhead recovery rates/hour	
Fixed	0.50
Variable	1.00
Actual Overhead - Fixed	2,000
- Variable	4,300

Required :

Prepare the operating statement for April in the same form as for March.

PROBLEM NO. 34 :

Gem and Co. manufactures a product for which the standards have been ascertained as below :

Particulars	Per Unit (Rs.)
Materials - 2 units at Rs. 20	40
Labour - 20 hours @ Rs. 2.00	40
Variable Overhead - 20 hours @ Rs. 0.4	8
Fixed Overhead - 20 hours @ Rs. 1	20
Total Cost	108
Profit	32
Selling Price	140

During the budget period, the company could produce and sell only 8,000 units, as against a budget of 10,000 units. The company's profit and loss account is presented below -

P & L Account

Particulars	Rs.	Particulars	Rs.
To Materials (16,500 units)	3,96,000	By Sales (8,000 units)	11,20,000
To Wages (1,70,000 hours)	3,46,800		
To Variable Overhead	60,000		
To Fixed Overhead	1,84,000		
To Net Profit	1,33,200		
Total	11,20,000	Total	11,20,000

You are required to reconcile the actual profit with the budgeted profit, in terms of variances.

PROBLEM NO. 35 :

A Company manufactures a product whose data for a period has been analysed as follows. Standard profit margin is at 25% on sale price. Budgeted sales for the period is Rs. 39,200.

Standard Cost :	Rs.
Direct materials- 5 units at Rs. 3	15
Direct labour - 5 hours at Rs. 5	25
Production overheads - 5 hours at Rs. 4	20
Total Cost	60
Actual Data :	
Sales	35,000
Direct materials	8,000
Direct labour	12,000

Analysis of Variances (Rs.)

Particulars	Adverse	Favourable
Direct materials		
Price	800	-
Usage	-	405
Direct labour		
Rate	-	975
Efficiency	300	-
Production overhead		
Expenditure	200	-
Volume	-	340

You are required to compute the following from the above details :

- (i) Actual production
- (ii) Actual profit
- (iii) Actual hours worked
- (iv) Budgeted hours worked
- (v) Production overhead efficiency variance
- (vi) Production overhead capacity variance
- (vii) Sales price variance
- (viii) Profit volume variance
- (ix) Reconciliation between actual profit and budgeted profit.

RECONCILIATION OF PROFIT – MARGINAL COSTING APPROACH

Note : The difference between absorption costing and marginal costing approach is in the treatment of fixed cost only. Absorption costing treats fixed cost as Product Cost and Marginal costing treats fixed cost as Period Cost.

Reconciliation Statement – Budgeted Profit with Actual Profit :

Particulars	Rs.	Rs.	Rs.
Budgeted Profit (Bud. Qty. x Std. Profit p.u.)			xxx
Contribution Volume Variance [Also called as gross sales margin volume variance]			xxx
Sales Price Variance [sales margin price variance]			xxx
<u>Material Cost Variance :</u>			
Material Price Variance		xxx	
Material Usage Variance –			
Material Mix Variance	xxx		
Material Sub-usage / Yield Variance	xxx	xxx	xxx
<u>Labour Cost Variance :</u>			
Labour Rate Variance		xxx	
Labour Efficiency Variance –			
Labour Mix Variance	xxx		
Labour Idle Time Variance	xxx		
Labour Sub-efficiency Variance	xxx	xxx	xxx
<u>Variable OH Cost Variance :</u>			
Variable OH Expenditure Variance		xxx	
Variable OH Efficiency Variance		xxx	xxx
Fixed OH Expenditure Variance			xxx
Actual Profit (Actual Qty. Sold x Actual Profit p.u.)			xxx

Summary of Changes for the above

Absorption Costing Approach	Marginal Costing Approach
1. Profit Volume Variance is used.	1. Contribution Volume Variance is used.
2. Fixed OH Cost Variance or its entire sub-analysis is used. i.e. (Expenditure variance + Capacity variance + Efficiency variance.)	2. Only Fixed OH Expenditure variance is used.

Reconciliation Statement – Budgeted Contribution with Actual Contribution :

(When fixed cost is not given in the question)

Particulars	Rs.	Rs.	Rs.
Budgeted Contribution (Bud. Qty. x Std. Cont. p.u.)			xxx
Contribution Volume Variance [Also called as gross sales margin volume variance]			xxx
Sales Price Variance [sales margin price variance]			xxx
Material Cost Variance :			
Material Price Variance		xxx	
Material Usage Variance –			
Material Mix Variance	xxx		
Material Sub-usage / Yield Variance	xxx	xxx	xxx
Labour Cost Variance :			
Labour Rate Variance		xxx	
Labour Efficiency Variance –			
Labour Mix Variance	xxx		
Labour Idle Time Variance	xxx		
Labour Sub-efficiency Variance	xxx	xxx	xxx
Variable OH Cost Variance :			
Variable OH Expenditure Variance		xxx	
Variable OH Efficiency Variance		xxx	xxx
Actual Contribution			xxx

PROBLEM NO. 36

Osaka Manufacturing Co. (OMC) is a leading consumer goods company. The budgeted and actual data of OMC for the year 2016-17 are as follows -

Particulars	Budget	Actual	Variance
Sales / Production (units)	2,00,000	1,65,000	(35,000)
Sales Revenue (₹)	21,00,000	16,92,900	(4,07,100)
Less: Variable Costs (₹)	12,66,000	10,74,150	1,91,850
Less: Fixed Costs (₹)	3,15,000	3,30,000	(15,000)
Profit	5,19,000	2,88,750	(2,30,250)

The budgeted data shown in the table is based on the assumption that total market size would be 4,00,000 units but it turned out to be 3,75,000 units.

Required :

PREPARE a statement showing reconciliation of budget profit with actual profit through marginal costing approach for the year 2016-17 in as much detail as possible.

PROBLEM NO. 37 :

A company, which uses standard marginal costing, furnishes the following details relating to a single product manufactured and sold in a quarter :

Particulars	Budget	Actual
Sales units	6,000	6,400
	(Rs. '000)	(Rs. '000)
Sales	1,500	1,696
Direct materials	240	270
Direct labour	360	416
Variable overheads	600	648
Total variable costs	1,200	1,334

The sales budget is based on the expectation of the company's estimated market share of 12%. The market report reveals that the actual sales of the product in the whole country for the quarter is 60,000 units.

Further data are given as under :	Standard	Actual
Direct material price per kg.	Rs. 8	Rs. 7.50
Direct labour rate per hour	Rs. 6	Rs. 6.40

Required :

i) Compute the following variances for the quarter.

- **Gross margin sales**
 - (a) Market size variance
 - (b) Market share variance
 - (c) Volume variance
- Sales Price Variance
- Direct Materials usage and price variances.
- Direct Labour efficiency and rate variances.
- Variable overheads efficiency and expenses variances.

(ii) Prepare an operating statement reconciling the budgeted contribution with actual contribution.

Relevant Cost Approach to Variance Analysis

Traditional approach to variance analysis is to compute variances based on actual cost and standard cost of actual output. However, this approach is misleading when inputs are limited. Failure to use limited inputs properly leads not only to adverse usage variance but also to a lost contribution. Therefore, it is necessary to consider the lost contribution in variance analysis, to get the correct picture.

PROBLEM NO. 38 :

Let's assume that 1 unit of output requires 5 kgs. of input. However, the input is in short supply and we have only 5,000 kgs. of raw material available in a month.

Each unit of output earns a contribution of Rs. 50. The standard price of raw material is Rs. 20 per kg. and the actual price of raw material consumed is Rs. 22 per kg.

The firm has actually produced 950 units of output using entire 5,000 kgs. of raw material during a particular month.

You are required to calculate –

- (a) Material Price Variance,
- (b) Material Usage Variance and
- (c) Opportunity Cost Variance.

PROBLEM NO. 39 : [May 2018 Exam]

Trident Toys Ltd. manufactures a single product and the standard cost system is followed. Standard cost per unit is worked out as follows :

Particulars	(₹)
Material (10 kgs. @ Rs. 4 per kg.)	40
Labour (8 hours @ Rs. 8 per hour)	64
Variable OH (8 hours @ Rs. 3 per hour)	24
Fixed OH (8 hours @ Rs. 3 per hour)	24
Standard Profit per unit	56

Overheads are allocated on the basis of direct labour hours. In the month of April 2018, there was no difference between the budgeted and actual selling price and there were no opening or closing stock during the period.

The other details for the month of April 2018 are as under :

Particulars	Budgeted	Actual
Production and Sales	2,000 units	1,800 units
Direct Materials	20,000 kgs. @ ₹ 4 per kg.	20,000 kgs. @ ₹ 4 per kg.
Direct Labour	16,000 hours @ ₹ 8 per hr.	14,800 hours @ ₹ 8 per hr.
Variable Overheads	₹ 48,000	₹ 44,400
Fixed Overheads	₹ 48,000	₹ 48,000

Required :

- I. Reconcile the budgeted and actual profit with the help of variances according to each of the following method: (12 Marks)
 - (a) The conventional method
 - (b) The relevant cost method assuming that -
 - (i) Materials are scarce and are restricted to supply of 20,000 kgs. for the period.
 - (ii) Labour hours are limited and available hours are only 16,000 hours for the period.
 - (iii) There is no scarce inputs.
- II. Comment on the efficiency and responsibility of the Sales Manager for not using scarce resources. (8 Marks)

Solution 39 :

Student Note : The expected interpretation for reconciliation methods is as follows :

- (a) The conventional method = Absorption costing method
- (b) The relevant cost method = Marginal costing method
 - (i) With Material as Key Factor
 - (ii) With Labour as Key Factor and
 - (iii) With no scarce input i.e. no key factor (i.e. simple marginal costing method)

1. Calculation of Standard Sales Price :

If we add the standard cost and profit per unit given in the question, then we can obtain the standard / budgeted selling price per unit. It comes to ₹ 208 per unit. There is no difference in the budgeted and actual selling price. Hence, Sales Price Variance is NIL.

2. Calculation of Standard Contribution per unit :

$$\begin{aligned}
 &= \text{Standard selling price} - \text{Standard variable cost per unit} \\
 &= ₹ 208 - (40 + 64 + 24) = ₹ 80 \text{ per unit}
 \end{aligned}$$

3. Calculation of Budgeted & Actual Profit for April 2018 :

Particulars	Budgeted (₹)	Actual (₹)
(a) Sales Revenue	4,16,000 (2,000 units x 208)	3,74,400 (1,800 units x 208)
(b) Direct Material cost	80,000 (20,000 kgs. @ ₹ 4)	80,000 (20,000 kgs. @ ₹ 4)
(c) Direct Labour cost	1,28,000 (16,000 hours @ ₹ 8)	1,18,400 (14,800 hours @ ₹ 8)
(d) Variable Overheads	48,000	44,400
(e) Fixed Overheads	48,000	48,000
(f) Profit [a - b - c - d - e]	1,12,000	83,600

4. Calculation of Variances under Conventional Absorption Costing Method :

(a) Sales Price Variance = NIL

(b) Profit Volume Variance

= Std. Profit per unit x (Budgeted sales Qty. - Actual sales Qty.)

= ₹ 56 x (2,000 - 1,800) = ₹ 11,200 (A)

(c) Material Price Variance = NIL

(d) Material Usage Variance

= Std. price x (Standard Qty. - Actual Qty.)

= ₹ 4 x [(1,800 units x 10 kg.) - 20,000 kg.]

= ₹ 4 x [18,000 kg. - 20,000 kg.] = ₹ 8,000 (A)

(e) Labour Rate Variance = NIL

(f) Labour Efficiency Variance

= Std. Rate x (Standard Hours - Actual Hours)

= ₹ 8 x [(1,800 units x 8 hours) - 14,800 hrs.]

= ₹ 8 x [14,400 hrs. - 14,800 hrs.] = ₹ 3,200 (A)

(g) Variable OH Expenditure Variance

= (SRR/hr. x Actual hours) - Actual OH

= (₹ 3 x 14,800 hrs.) - ₹ 44,400 = NIL

(h) Variable OH Efficiency Variance

= SRR/hr. x (Standard Hours - Actual Hours)

= ₹ 3 x [14,400 hrs. - 14,800 hrs.] = ₹ 1,200 (A)

(i) Fixed OH Expenditure Variance

= Budgeted OH - Actual OH

= ₹ 48,000 - ₹ 48,000 = NIL

(j) Fixed OH Volume Variance

= SRR per unit x (Budgeted Output - Actual Output)

= ₹ 24 x (2,000 - 1,800) = ₹ 4,800 (A)

5. Reconciliation Statement of Profit - Conventional Absorption Costing Method:

Particulars	(₹)	(₹)
Budgeted Profit		1,12,000
<u>Less : Adverse Variances :</u>		
Profit Volume Variance	11,200	
Material Usage Variance	8,000	
Labour Efficiency Variance	3,200	
Variable OH Efficiency Variance	1,200	
Fixed OH Volume Variance	4,800	(28,400)
Actual Profit		83,600

6. Relevant Cost Approach (Marginal Costing) - Assuming No Scarce Input :

(a) Contribution Volume Variance

= Std. contribution per unit x (Budgeted sales Qty. - Actual sales Qty.)

= ₹ 80 x (2,000 - 1,800) = ₹ 16,000 (A)

(b) Fixed OH Expenditure Variance = NIL

(c) Reconciliation Statement of Profit :

Particulars	(₹)	(₹)
Budgeted Profit		1,12,000
<u>Less : Adverse Variances :</u>		
Contribution Volume Variance	16,000	
Material Usage Variance	8,000	
Labour Efficiency Variance	3,200	
Variable OH Efficiency Variance	1,200	(28,400)
Actual Profit		83,600

7. Relevant Cost Approach (Marginal Costing) - Assuming Material is Scarce :

Particulars	Figures
(a) Standard Qty. of RM to be used (1,800 units x 10 kg.)	18,000 kgs.
(b) Actual Qty. of RM used (given)	20,000 kgs.
(c) Excess Qty. of RM used [a - b]	2,000 kgs.
(d) Std. contribution per kg. of RM [₹ 80 per unit / 10 kg.]	₹ 8 per kg.
(e) Loss of contribution due to excess use of RM [c x d]	₹ 16,000 (A)

Note : Excess use of 2,000 kgs of Raw Material will lead to reduction in quantity produced to the extent of 200 units (i.e. 2,000 kg / 10 kg p.u.). Production Manager is responsible for this variance. The Sales Manager is not responsible for excess use of material, hence we should reduce Contribution Volume Variance to the extent of 200 units i.e. (200 units x ₹ 80 per unit) = 16,000 (A). The revised Contribution Volume Variance shall be -

= Original Variance - Variance due to excess use of material

= 16,000 (A) - 16,000 (A) = NIL

Reconciliation Statement of Profit :

Particulars	(₹)	(₹)
Budgeted Profit		1,12,000
<u>Less : Adverse Variances :</u>		
Contribution Volume Variance (revised)	NIL	
Material Usage Variance	8,000	
Variance due to excess use of RM	16,000	
Labour Efficiency Variance	3,200	
Variable OH Efficiency Variance	1,200	(28,400)
Actual Profit		83,600

8. Relevant Cost Approach (Marginal Costing) - Assuming Labour is Scarce :

Particulars	Figures
(a) Standard Hours required (1,800 units x 8 hrs.)	14,400 hrs.
(b) Actual Hours used (given)	14,800 hrs.
(c) Excess Hours used [a - b]	400 hrs.
(d) Std. contribution per labour hour [₹ 80 per unit / 8 hrs.]	₹ 10 per hr.
(e) Loss of contribution due to excess use of Labour [c x d]	₹ 4,000 (A)

Note : Excess use of 400 hours of Labour will lead to reduction in quantity produced to the extent of 50 units (i.e. 400 hrs. / 8 hrs. p.u.). Production Manger is responsible for this variance and not the Sales Manager. Hence, we should reduce Contribution Volume Variance to the extent of 50 units i.e. (50 units x ₹ 80 per unit) = 4,000 (A). The revised Contribution Volume Variance shall be -

$$\begin{aligned}
 &= \text{Original Variance} - \text{Variance due to excess use of labour} \\
 &= 16,000 \text{ (A)} - 4,000 \text{ (A)} = ₹ 12,000 \text{ (A)}
 \end{aligned}$$

Reconciliation Statement of Profit :

Particulars	(₹)	(₹)
Budgeted Profit		1,12,000
<u>Less : Adverse Variances :</u>		
Contribution Volume Variance (revised)	12,000	
Material Usage Variance	8,000	
Labour Efficiency Variance	3,200	
Variance due to excess use of Labour	4,000	
Variable OH Efficiency Variance	1,200	(28,400)
Actual Profit		83,600

9. Comments on the efficiency and responsibility of Sales Manager :

Generally, reduction in profit is the joint responsibility of Production Manager and Sales Manager. We broadly classify the variances for reconciliation of profit in 3 parts i.e. (a) Sales Price Variance, (b) Cost Price Variance and (c) Profit Volume Variance.

Out of these, Sales Manager is responsible mainly for Sales Price Variance and Profit Volume Variance. Production Manger is mainly responsible for Cost Price Variance. We can further say that Purchase Manager is responsible for Material Price Variance and Personnel Manager is responsible for Labour Rate Variance.

As the efficient use of resources is not the responsibility of Sales Manager, we should exclude such variances from his responsibility. Hence, contribution lost due to inefficient use of resources like Material and Labour is excluded from the Contribution Volume Variance.

Question 40 : [Jan. 2021 Exam - 10 Marks]

Sri Manufacturers Ltd. manufactures a single product. Standard cost per unit is as follows :

Particulars		₹
Materials	12 kgs x ₹ 5 per kg.	60
Labour	10 hrs x ₹ 7 per hour	70
Variable Overheads	10 hrs x ₹ 3 per hour	30
Fixed Overheads	10 hrs x ₹ 3 per hour	30
Profit		60
Selling Price		250

Overheads are allocated on the basis of direct labour hours. In the month of March 2020, there was no difference between the budgeted and actual selling price and there was no opening and closing stock during the period.

The other details for the month of March 2020 are as under :

Particulars	Budgeted	Actual
Sales	2,500 units	2,000 units
Direct Materials	30,000 kgs @ 5 per kg.	30,000 kgs @ 5 per kg
Direct Labour	25,000 hrs @ ₹ 7 per hour	22,500 hrs @ ₹ 7 per hour
Variable Overheads	₹ 75,000	₹ 67,500
Fixed Overheads	₹ 75,000	₹ 75,000

Required :

RECONCILE the budgeted and actual profit with the help of variances according to each of the following methods :

- (i) The conventional method (3 Marks)
- (ii) The relevant cost method assuming that -
 - (a) Materials are scarce and are restricted to supply of 30,000 kgs for the period. (3 Marks)
 - (b) Labour hours are limited and available hours are only 25,000 hours for the period. (4 Marks)

Answer 40 :

Student Note : Conventional method means, absorption costing method and relevant cost method means, marginal costing method of reconciliation of variances with opportunity cost.

Sales price per unit, Material price per kg, Labour rate per hour and Variable OH rate per hour are same for Budget & Actual. Hence, we will get NIL variance for Sales Price, Material Price, Labour Rate and Variable OH Expenditure variance. Hence, it is not calculated by ICAI.

Budgeted Fixed OH and Actual Fixed OH is same, hence Fixed OH Expenditure variance is NIL.

For scarce resources, we need to calculate opportunity cost i.e. loss of contribution as a variance.

Computation of Variances :**Material Usage Variance**

$$\begin{aligned}
 &= \text{Standard Price} \times (\text{Standard Quantity} - \text{Actual Quantity}) \\
 &= ₹ 5.00 \times (24,000 \text{ Kgs.} - 30,000 \text{ Kgs.}) \\
 &= ₹ 30,000 \text{ (A)}
 \end{aligned}$$

$$\left[2,000 \text{ units} \times \frac{30,000 \text{ kgs.}}{2,500 \text{ units}} \right]$$

Labour Efficiency Variance

$$\begin{aligned}
 &= \text{Standard Rate} \times (\text{Standard Hours} - \text{Actual Hours}) \\
 &= ₹ 7.00 \times (20,000 \text{ hrs.} - 22,500 \text{ hrs.}) \\
 &= ₹ 17,500 \text{ (A)}
 \end{aligned}$$

$$\left[2,000 \text{ units} \times \frac{25,000 \text{ hrs.}}{2,500 \text{ units}} \right]$$

Variable Overhead Efficiency Variance

$$\begin{aligned}
 &= \text{SRR/hr.} \times (\text{Standard Hours} - \text{Actual Hours}) \\
 &= (₹ 75,000 / 25,000 \text{ hrs.}) \times (20,000 \text{ hrs.} - 22,500 \text{ hrs.}) \\
 &= ₹ 7,500 \text{ (A)}
 \end{aligned}$$

Fixed Overhead Volume Variance

$$\begin{aligned}
 &= \text{SRR/unit} \times (\text{Budgeted Output} - \text{Actual Output}) \\
 &= (₹ 75,000 / 2,500 \text{ units}) \times (2,500 \text{ units} - 2,000 \text{ units}) \\
 &= ₹ 15,000 \text{ (A)} - \text{it is for absorption costing method only}
 \end{aligned}$$

Sales Margin Volume Variance (i.e. Profit volume variance)

$$\begin{aligned}
 &= \text{Std. Profit per unit} \times (\text{Budgeted Output} - \text{Actual Output}) \\
 &= ₹ 60 \times (2,500 \text{ units} - 2,000 \text{ units}) \\
 &= ₹ 30,000 \text{ (A)} - \text{it is for absorption costing method}
 \end{aligned}$$

Sales Contribution Volume Variance (i.e. Contribution volume variance)

$$\begin{aligned}
 &= \text{Std. Contribution per unit} \times (\text{Budgeted Output} - \text{Actual Output}) \\
 &= ₹ 90 \times (2,500 \text{ units} - 2,000 \text{ units}) \\
 &= ₹ 45,000 \text{ (A)} - \text{it is for marginal costing method}
 \end{aligned}$$

Notes :**Scarce Material**

Based on conventional method, direct material usage variance is ₹ 30,000 (A) i.e. 6,000 kg x ₹ 5. In the situation where material is scarce, material usage variance should also include contribution lost per unit of material. Excess usage of 6,000 kg. leads to loss of contribution of ₹ 45,000 i.e. 6,000 kgs x ₹ 7.5 per kg. (i.e. ₹ 90 / 12 kg.). Total material usage variance based on relevant cost method, when material is scarce will be : ₹ 30,000 (A) + ₹ 45,000 (A) = ₹ 75,000 (A). Since labour is not scarce, labour variances are identical to conventional method.

One unit requires 12 kgs. of raw material, hence excess usage of 6,000 kgs. leads to loss of 500 units (i.e. 6,000 kg. / 12 kg.). On these 500 units, we lost an opportunity to earn ₹ 45,000 (500 units x ₹ 90). It is not the function of the sales manager to use material efficiently. Hence, loss of contribution from 500 units should be excluded while computing sales contribution volume variance.

Therefore, sales contribution volume variance, when materials are scarce will be NIL. i.e. ₹ 45,000 (A) - ₹ 45,000 (A).

Scarce Labour

In conventional method, excess labour hours used are : 20,000 hrs. – 22,500 hrs. = 2,500 hrs. However, one unit requires 10 hrs. and hence, contribution lost per hour = ₹90/10 hrs. = ₹ 9 per hour. Therefore, total contribution lost, when labour is scarce will be 2,500 hrs. x ₹ 9 = ₹ 22,500. Therefore, total labour efficiency variance, when labour hours are scarce will be = ₹ 17,500 (A) + ₹ 22,500 (A) = ₹ 40,000 (A).

Excess usage of 2,500 hrs. leads to loss of 250 units (2,500 hrs. / 10 hrs. per unit). Hence, loss of contribution shall be ₹ 22,500 (i.e. 250 units x ₹ 90 per unit). It is not the function of the sales manager to use labour hours efficiently. Hence, loss of contribution from 250 units should be excluded while computing sales contribution volume Variance.

Therefore, sales contribution volume variance, when labour hours are scarce will be ₹ 45,000 (A) - ₹ 22,500 (A) = ₹ 22,500 (A).

Fixed Overhead Volume Variance

Fixed overhead volume variance does not arise in marginal costing system. In absorption costing system, it represents the value of the under or over absorbed fixed overheads due to change in production volume. When marginal costing is in use, there is no fixed overhead volume variance, because marginal costing does not absorb fixed overheads.

Based on the above discussion and calculations, we can prepare reconciliation statement as follows :

Statement Showing "Reconciliation between Budgeted Profit & Actual Profit"

Particulars	Conventional Method (₹)	Relevant Cost Method (₹)	
		Scarce Material	Scarce Labour
Budgeted Profit (2,500 units x ₹ 60)	1,50,000	1,50,000	1,50,000
Profit / Contribution Volume Variance	30,000 (A)	NIL	22,500 (A)
Material Usage Variance	30,000 (A)	75,000 (A)	30,000 (A)
Labour Efficiency Variance	17,500 (A)	17,500 (A)	40,000 (A)
Variable Overhead Efficiency Variance	7,500 (A)	7,500 (A)	7,500 (A)
Fixed Overhead Volume Variance	15,000 (A)	N.A.	N.A.
Actual Profit	50,000	50,000	50,000

PROBLEM NO. 41 : [May 2018 Exam]

A company is planning to improve its profit level at least by 10% from the preliminary budget estimates of a profit of ₹ 32,80,000 for the coming year. It has worked out the following profit improvement plan:

- (i) In the year just concluded the sales of the company were 10% of the total market of 12,00,000 units. For the preparation of the original budget estimate, the same market demand and the same share of market for the company was envisaged. Now it has been estimated that the total market demand will increase by 18% and the company's market share will increase to 11% from the present level of 10%.
- (ii) The products are sold in two sizes - large and medium. The sales mix of each size was 50:50 so far. Now it is planned that the sales will be 40% of large and 60% of medium size. The medium packs and large packs have a contribution of ₹ 10 and ₹ 8 per pack respectively. The budget proposes to raise the price in such a manner that the contribution per pack will increase by ₹ 0.60 for each size.
- (iii) There will be an additional expenditure on sales promotion worth ₹ 78,000.
- (iv) The company proposes to save ₹ 9,000 by saving on interest cost in the coming year by better financial management.

You are required to draw a profit improvement plan in financial terms and spelling out separately the effect of various factors on profit. **(10 Marks)**

Solution 41 :

Approach : This question is similar to reconciliation of profit question. The only difference here is that - we have to reconcile original budgeted contribution with revised budgeted contribution. Mainly 3 variances are to be considered i.e.

- (a) Sales Price Variance,
- (b) Cost Price Variance and
- (c) Contribution Volume Variance divided in to Mix Variance & Quantity Variance.

Key Calculations :

Particulars	Original Budget	Revised Budget
(a) Market Size (units)	12,00,000 (given)	14,16,000 (12,00,000 + 18%)
(b) Market Share (units)	1,20,000 (12,00,000 x 10%)	1,55,760 (14,16,000 x 11%)
(c) Sales Mix Ratio	50% : 50%	40% : 60%
(d) Sale of Large Packs (units)	60,000 (1,20,000 x 50%)	62,304 (1,55,760 x 40%)
(e) Sale of Medium Packs (units)	60,000 (1,20,000 x 50%)	93,456 (1,55,760 x 60%)

(f) Contribution per unit (₹)		
*Large Pack	8	8.60
*Medium Pack	10	10.60
(g) Total Contribution (₹)		
Large Pack [d x f]	4,80,000	5,35,814.40
Medium Pack [e x f]	6,00,000	9,90,633.60
Grand Totals	10,80,000	15,26,448.00
(h) Cost Effect (₹)		
Addl. sales promotion expense	---	(78,000)
Savings in interest cost	---	9,000
(i) Net Contribution [g + h]	10,80,000	14,57,448
(j) Net increase in profit	---	3,77,448
(k) Percentage increase in profit [3,77,448 / 32,80,000 x 100]	---	11.51%

***Note :** In the given question, while mentioning contribution per pack, sequence is changed.

1. Sales Price Variance :

= Actual Qty. sold x Increase in sales price

Size of Product	Calculations	₹
Large	62,304 units x 0.60	37,382.40 (F)
Medium	93,456 units x 0.60	56,073.60 (F)
Total		93,456.00 (F)

2. Contribution Mix Variance :

= Std. Contribution p.u. x (Std. Mix - Actual Mix)

Size	Std. Cont.	Std. Mix	Actual Mix	₹
Large	8	77,880	62,304	1,24,608 (A)
Medium	10	77,880	93,456	1,55,760 (F)
Total		1,55,760	1,55,760	31,152 (F)

50 : 50

3. Contribution Quantity Variance :

= Std. Contribution p.u. x (Bud. Qty. - Std. Mix)

Size	Std. Cont.	Bud. Qty.	Std. Mix	₹
Large	8	60,000	77,880	1,43,040 (F)
Medium	10	60,000	77,880	1,78,800 (F)
Total		1,20,000	1,55,760	3,21,840 (F)

4. Statement Showing Change in Profit :

Particulars	₹
Original Budgeted Profit (given)	32,80,000
Add : Increase in profit due to increase in sales price	93,456
Add : Increase in profit due to change in product mix	31,152
Add : Increase in profit due to increase in sales quantity	3,21,840
Less : Increase in sales promotion expenses	(78,000)
Add : Savings in interest cost	9,000
Revised profit as per improvement plan	36,57,448
Net increase in profit [36,57,448 - 32,80,000]	3,77,448
Percentage increase in profit (3,77,448 / 32,80,000) x 100	11.51%

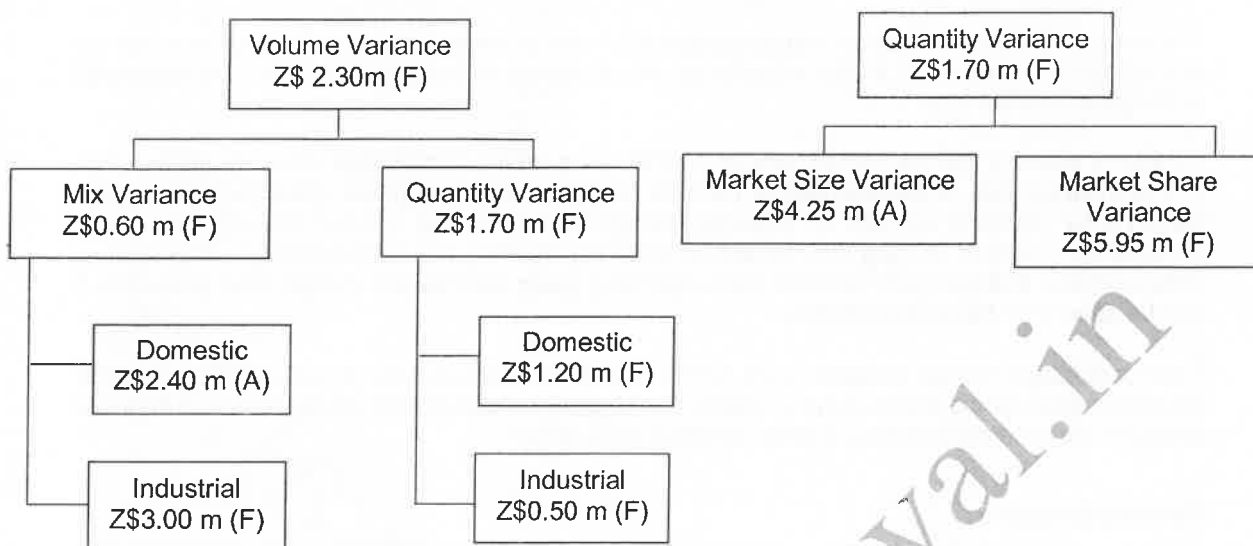
Question 42 : [RTP Nov. 2020 & MTP May 2020]

ZM Inc. is a family run business based in Country Z. It is a manufacturer of two types of flooring rolls, one for industrial usage and the other for domestic residential use, throughout mainland of Country Z. The company started with the production of residential domestic flooring. It is now an established player in this market. In the recent years, the company pioneered into making flooring rolls for industrial usage. The management has the following information about the budgeted and actual data for 2020 –

Particulars	Static Budget			Actual Result		
	Industrial	Domestic	Total	Industrial	Domestic	Total
Unit Sales in Rolls ('000)	200	600	800	270	570	840
Contribution Margin (Z\$ in millions)	10.00	24.00	34.00	12.825	15.390	28.215

In late 2019, a marketing research estimated market volume for industrial and domestic flooring at 8 million Rolls. Actual market volume for 2020 was 7 million Rolls. Actual sales trend of ZM Inc. is indicative of the sales trends for individual products in the future years, it is likely that they might continue to sell on a similar sales trajectory.

A newly appointed accountant has computed following variances from the above data:



'Z\$' is the currency of Country Z and
'm' refers to million; assume figures in this chart are correct.

Required :

Assuming yourself as a performance management expert of ZM, the CEO has asked you to:

- ANALYSE the variances computed by the accountant;
- ADVISE strategic inputs on 'two types of flooring rolls' to help out her in strategic decision making.

Answer 42 :

Student Note : Please note that the variances given in the question are not Sales Variances, but these are Contribution Variances. The common multiplier in calculation of these variances is 'Standard Contribution Per Unit'.

(i) Analysis of Variances :

It can be seen that total number of units sold have increased by 40,000 rolls, which resulted in a favourable volume variance. Therefore, a potential increase of Z\$2.3m in contribution margin was achieved as a result of change in sales volume compared with budgeted volume.

The volume variance is further divided into a mix and quantity variance. In the case of ZM, mix variance came out to be Z\$0.60m favourable and the quantity variance came out to be favourable Z\$1.70m. Favourable mix variance Z\$0.60m indicates that the sales mix shifts toward the industrial flooring rolls i.e. high contribution product. ZM sold 40,000 more rolls than were budgeted, resulting in Z\$1.70m favourable quantity variance. Therefore, it is necessary to identify the reasons behind the increase in sales.

The reasons may be competitor's distribution issues, better customer services or growth in overall market. Further insight into reasons of quantity variance can be gained by analyzing market share and market size variances. ZM has gained 2% extra market share from 10%

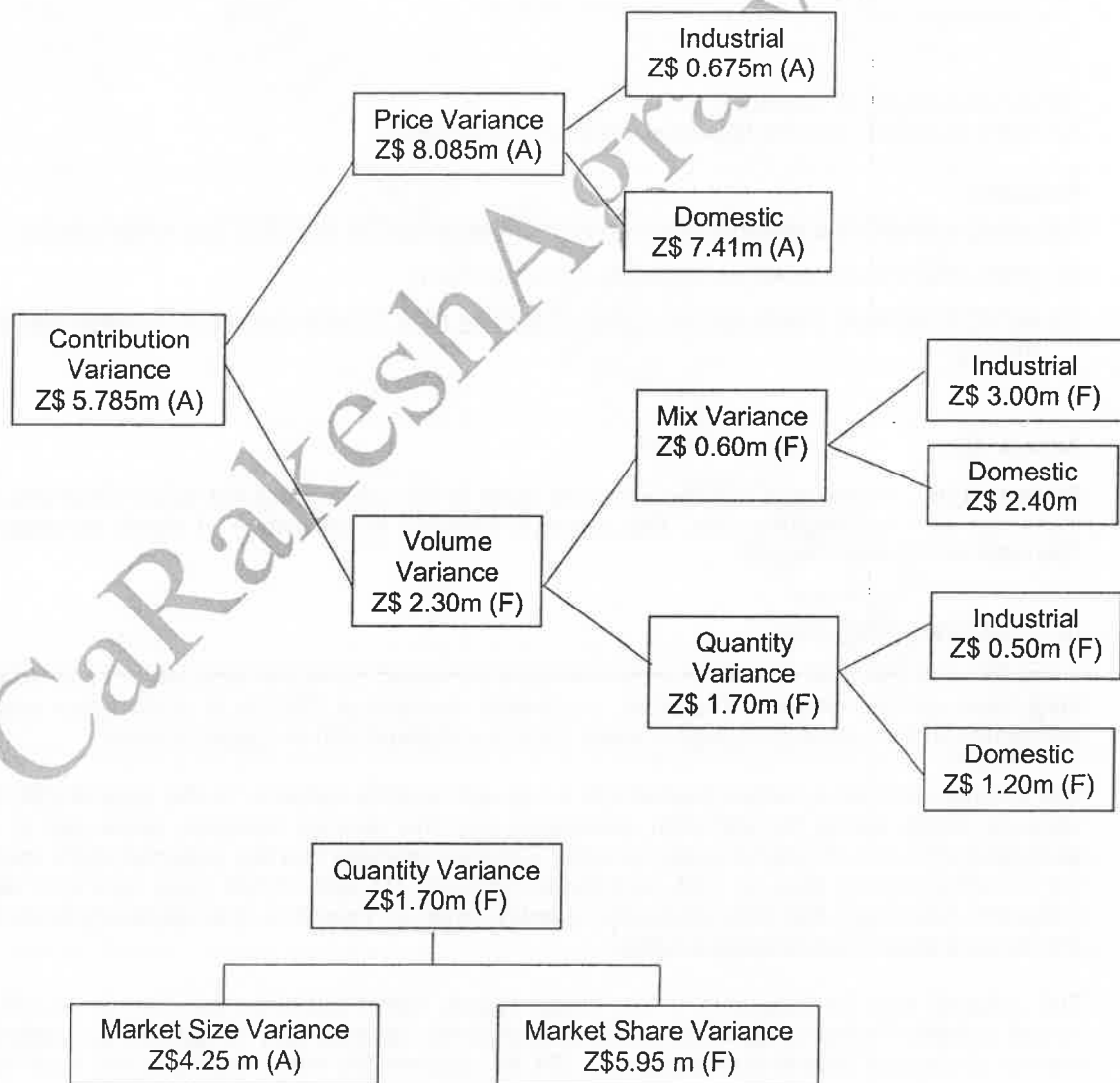
budgeted share to the actual share of 12%. The Z\$ 5.95m favourable market share variance may be due to the effect of the decline in contribution margin per unit.

The impact of changing market size on contribution can be traced through market size variance. Market size variance is Z\$ 4.25m adverse as actual market size decreased by 12.5% compared to budgeted market size.

Further, it appears that accountant has missed to compute the contribution price variance, which is a substantial part of the analysis. If we look closely at the data given, the contribution price variance for domestic as well as industrial roll can be computed without difficulty. The price variance for domestic flooring rolls as well as industrial flooring rolls is Z\$ 8.085 m unfavourable. This indicates that the both varieties were sold at a lower contribution margin than standard. It can be seen from the working below.

Total contribution margin variance is Z\$ 5.785 m adverse. The analysis shows that this negative impact on total contribution margin is mainly due to adverse contribution price variance. Revised structure after the computation of price variance is as under :

Revised Structure :



Workings :**Contribution Price Variance :**

$$= \text{Actual Qty. Sold} \times (\text{Std. Cont. p.u.} - \text{Actual Cont. p.u.})$$

Product	Actual Qty. (units '000)	Standard Contribution per unit (Z\$)	Actual Contribution per unit (Z\$)	Variance (Z\$)
Industrial	270	50.00	47.50	0.675m(A)
Domestic	570	40.00	27.00	7.41 m(A)
Total	840			8.085m(A)

(ii) Strategic Inputs :

The actual sale of industrial flooring rolls is 35% higher than projections. However, actual contribution margin of Z\$47.5 is marginally lower than standard contribution margin of Z\$50 per unit. This indicates that ZM may have cut its selling price to maintain or gain market share. Therefore, industrial flooring rolls is in the Growth Phase of product life cycle. Due to increase in demand, there is a possibility of higher sales and profits to be made in future years.

Similarly, the actual sale of domestic flooring roll is 5% lower than the expectations. However, actual contribution margin is Z\$27 per roll i.e. 32.5% lower than the standard contribution margin. This indicates that ZM may have sold these at substantially reduced price to maintain the sales volume. Therefore, the domestic residential flooring rolls might be in the Decline Stage of product life cycle.

The market size for flooring rolls has reduced from an expectation of 80 lakh rolls to 70 lakh rolls. Therefore, the market size has shrunk significantly by 12.5% for the year 2020. This is a threat to profitability of business. The management has to understand the reasons behind this shrinkage. For example, dwindling demand may be on account of cheaper substitutes available for flooring rolls. The management has to take cognizance of this threat to business. A positive for ZM is that its actual market share for flooring rolls was higher than expected at 12%. An increase in market share would have a beneficial impact on the company's profitability. Also, despite the shrinkage in market size, demand for industrial flooring rolls seems to be on the rise. This could be an opportunity for the management to consider.

As explained above, the industrial flooring rolls seem to be in the Growth Stage of product life cycle, while the domestic residential rolls are in the Decline Stage. Industrial flooring rolls have a higher contribution margin per roll as compared to domestic residential rolls. Accordingly, ZM may consider phasing out domestic flooring rolls and concentrate on industrial flooring rolls. In view of shrinking market conditions, it would be more profitable to phase out the weaker product and concentrate on the fast moving and profitable product. At the same time, since domestic flooring roll still has significant demand, the strategy to phase out this product may have to be done in a phased and well-planned manner. In view of the shrinking market size, ZM should not end up losing its market share due to phasing out domestic flooring rolls.

For Your Conceptual Understanding only (not required to be calculated)

"Budgeted Vs Actual Figures"

Product	Budgeted Qty. Rolls ('000)	Standard Cont. Per Roll (Z\$)	Budgeted Cont. (Z\$ in millions)	Actual Qty. Rolls ('000)	Actual Cont. Per Roll (Z\$)	Actual Cont. (Z\$ in millions)	Revised Actual Qty. ('000)
Ind.	200	50	10.00	270	47.5	12.825	210 (840x25%)
Dom.	600	40	24.00	570	27	15.390	630 (840x75%)
	800		34.00	840		28.215	840

Contribution Mix Variance :

Product	Standard Contribution per unit (Z\$)	Actual Qty. (AM) (units '000)	Revised Actual Quantity (SM) (units '000)	Difference ('000)	Variance (Z\$)
Industrial	50	270	210	+ 60	3.00m (F)
Domestic	40	570	630	- 60	2.40m (A)
Total		840	840		0.60m (F)

Contribution Quantity Variance :

Product	Standard Contribution per unit (Z\$)	Revised Actual Quantity (SM) (units '000)	Budgeted Quantity (units '000)	Difference ('000)	Variance (Z\$)
Industrial	50	210	200	+ 10	0.50m (F)
Domestic	40	630	600	+ 30	1.20m (F)
Total		840	800		1.70m (F)

Market Size Variance :

$$\begin{aligned}
 &= \text{Average Budgeted Contribution per unit} \times [\text{Budgeted Market Share \%} \times (\text{Actual Industry Sales Quantity in units} - \text{Budgeted Industry Sales Quantity in units})] \\
 &= \text{Z\$ } 42.50 \times [10\% \times (70,00,000 \text{ Rolls} - 80,00,000 \text{ Rolls})] \\
 &= \text{Z\$ } 4.25 \text{ m (A)}
 \end{aligned}$$

Market Share Variance :

$$\begin{aligned}
 &= [(\text{Actual Market Share \%} - \text{Budgeted Market Share \%}) \times \text{Actual Industry Sales Quantity in units}] \times (\text{Average Budgeted Contributor per unit}) \\
 &= [(12\% - 10\%) \times 70,00,000 \text{ Rolls}] \times \text{Z\$ } 42.50 \\
 &= \text{Z\$ } 5.95 \text{ m (F)}
 \end{aligned}$$

REVISION VARIANCE – PLANNING & OPERATIONAL VARIANCE

Introduction :

There may be a revision in the standards fixed earlier due to reasons beyond the control of the management. In this case we need to find out the revision variance i.e. the difference between old standard and new standard. This variance is treated as uncontrollable variance.

First we need to calculate total variance by comparing old standard with the actual data. Then with the old standard, work out '**Revision Variance**' (resulting on account of change in the standard in quantity or rate) and base the subsequent analysis on the basis of revised standard.

Planning & Operational Variance :

When the current environmental conditions are different from the anticipated environmental conditions (prevailing at the time of setting standard or plans) the use of routine analysis of variance for measuring managerial performance is not desirable / suitable. The variance analysis can be useful for measuring managerial performance if the variances computed are determined on the basis of revised targets / standards based on current actual environmental conditions.

In order to deal with the above situation i.e. to measure managerial performance with reference to material, labour and sales variances, it is necessary to compute the Planning and Operational Variances.

Original Standard is known as Ex-ante standard.

Standard ex ante

Before the event, an ex ante budget or standard is set before a period of activity commences.

Revised Standard is known as Ex-post standard.

Standard ex post

After the event, an ex post budget, or standard, is set after the end of a period of activity, when it can represent the optimum achievable level of performance in the conditions which were experienced.

A Planning Variance simply compares a revised standard to the original standard. It is also known as **Revision Variance** or **Uncontrollable Variance**. It is the variance between ex-ante standard and ex-post standard.

An Operational Variance simply compares the actual results against the revised standard. It is also known as **Regular Variance** or **Controllable Variance**. It is the difference between ex-post standard and actual result. Operating Variances would be calculated after the planning variances have been established and are thus a realistic way of assessing performance.

Thus, the budget can be flexed, and standards can reflect factors such as unanticipated changes in technology and in price levels. This approach may be used in conjunction with sophisticated cost and revenue modeling to determine how far both the planned and the achieved results differed from the performance that would have been expected in the circumstances which were experienced.

Practical Questions on Planning & Operational Variances
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PROBLEM 43 :

Calculate and analyse the material cost variances including revision variance, on the basis of following data :

The standard material price is Rs. 20 per kg.

However, due to general increase in prices globally, this material is now available at Rs. 25 per kg. This is considered to be the new standard price.

One unit requires 5 kgs. of raw material and during a period 1,000 units were produced from 5,400 kgs. of raw material @ Rs. 27 per kg.

PROBLEM 44 :

Calculate and analyse the material cost variances including revision variance, on the basis of following data :

Standard		Actual	
Material required	= 100 kg. for	Output	4,20,000 kg.
Finished product	70 kg.	Materials Used	5,80,000 kg.
Price of Material	Re. 1 per kg.	Cost of Materials	Rs. 6,38,000

On account of change in process standard input requirement is revised during the period as under –

Material for 80 kg. of finished product = 100 kg.

PROBLEM 45 : [ICAI Module]

Consider the following data related to Material 'X' -

Original Standards (ex-ante)	9,000 kgs. @ ₹ 12.50 per kg.
Revised Standards (ex-post)	10,125 kgs. @ ₹ 11.50 per kg.
Actual	8,750 kgs. @ ₹ 13.00 per kg.

You are required to calculate variances using -

- (a) Traditional Method and
- (b) Operational & Planning Variance Method

PROBLEM 46 :

The standard wage rate was Rs. 50 per hour, when the standards were set. However, due to a wage settlement with labour union, the wage rate is now revised to Rs. 60 per hour.

After such wage revision, the following data was compiled for a month.

The workers have produced an output of 2,500 units from 9,800 hours. The standard time per unit is 4 hours. The workers were paid @ Rs. 62 per hour.

Calculate Planning & Operational Labour Cost Variance, using the above data.

PROBLEM 47 :

Our company has set the work standard to measure the efficiency of workers. The workers are expected to produce 5 units in one hour. They are paid at standard hourly wage rate of Rs. 40 per hour.

However, recently our company has installed a new improved machine. It has helped the workers to produce more in less time. On new machine, a worker is able to produce 8 units in one hour.

After the installation of new machine, the following was noticed -

Workers have produced 7,000 units in 1,000 hours and they were paid @ Rs. 38 per hour.

Calculate Planning & Operational Labour Cost Variance, using the above data.

PROBLEM 48 : [ICAI Module]

Consider the following data related to Labour -

Original Standards (ex-ante)	1,100 hours @ ₹ 10 per hour
Revised Standards (ex-post)	880 hours @ ₹ 9 per hour
Actual	1,200 hours @ ₹ 8.50 per hour

You are required to calculate variances using -

- Traditional Method and
- Operational & Planning Variance Method

Question 49 : [RTP - May 2018]

T-tech is a Taiwan based firm, which designs, develops, and sells audio equipment. Founded in 1975 by Mr. Boss, firm sells its products throughout the world. T-tech is best known for its home audio systems and speakers, noise cancelling headphones, professional audio systems and automobile sound systems. Extracts from the budget are shown in the following table:

Home Audio System Division – Jan. 2018

System	Sales (units)	Selling Price (₹ per unit)	Standard Cost (₹ per unit)
3,000 W PMPO	1,500	18,750	12,500
5,000 W PMPO	500	50,000	26,250

You got the following information:

Actual results for Jan. 2018

System	Sales (units)	Selling Price ₹
3,000 W PMPO	1,500	17,250
5,000 W PMPO	600	53,750

The Managing Director has sent you a copy of an email he received from the Sales Manager 'K'. The content of the email are as follows:

"We have had an outstanding month. There was an adverse Sales Price Variance on the 3,000 W PMPO Systems of ₹ 22,50,000 but I compensated for that by raising the price of 5,000 W PMPO Systems. Unit sales of 3,000 W PMPO Systems were as expected but sales of the 5,000 W PMPOs were exceptional and gave a favourable Sales Margin Volume Variance of ₹ 23,75,000. I think I deserve a bonus!"

The managing Director has asked for your opinion on these figures.

The total market demand for 3,000 W PMPO Systems was as budgeted but as a result of suppliers reducing the price of supporting UHD TV System, the total market for 5,000 W PMPO Systems raised by 50% in Jan. 2018.

The company had sufficient capacity to meet the revised market demand for 750 units of its 5,000 W PMPO Systems and therefore could have maintained its market share.

Required :

- (i) CALCULATE the following Operational Variances based on the revised market details:
 - Sales Margin Mix Variance
 - Sales Margin Volume Variance
- (ii) COMMENT briefly on the measurement of the K's performance.

Solution 49 :

(i) **Statement Showing Sales Margin Mix Variance :**

$$= \text{Std. Profit p.u.} \times (\text{Std. Mix} - \text{Actual Mix})$$

System	Standard Profit per unit (₹)	Std. Mix (units) (2 : 1)	Actual Mix (units)	Variance (₹)
3,000 W PMPO	6,250	1,400	1,500	6,25,000 (F)
5,000 W PMPO	23,750	700	600	23,75,000 (A)
Total		2,100	2,100	17,50,000 (A)

(ii) **Statement Showing Sales Margin Volume Variance : [Market Share Variance]**

$$= \text{Std. Profit p.u.} \times (\text{Revised Bud. Qty.} - \text{Actual Qty. Sold})$$

System	Standard Profit per unit (₹)	Revised Bud. Qty. (units)	Actual Quantity (units)	Variance (₹)
3,000 W PMPO	6,250	1,500	1,500	-
5,000 W PMPO	23,750	750	600	35,62,500 (A)
Total		2,250	2,100	35,62,500 (A)

(iii) Comments on K's Performance :

A Planning Variance simply compares a revised standard (that should or would have been used if planners had known in advance what was going to happen) to the original standard. A planning variance is considered as non controllable by management.

The market size is not within the control of the sales manager and therefore variances caused by changes in the market size would be regarded as planning variance.

However, selling price variances and market share variance would be within the control of the sales manager and hence to be treated as operating variances.

It is vital to make this distinction because as can be seen from the scenario the measurement of the K's performance is incomplete if the revised market size is ignored.

The favourable volume variance of ₹ 23,75,000 referred to in the K's e-mail is made up of two elements, one of which, the favourable market size, is a planning variance which is outside his control. The other element is adverse market share variance, which is an operational variance. It is this that has caused the overall volume variance to be favourable, and thus 'K' is not responsible for the overall favourable performance.

On the contrary he is also responsible for adverse sales price variance on 3,000 W PMPO system. It is also an operational variance.

Hence, 'K' doesn't deserve any bonus.

Question 50 : [ICAI Module]

Managing Director of Petro-KL Ltd (PTKLL) thinks that Standard Costing has little to offer in the reporting of material variances due to frequent changes in price of materials.

PTKLL can utilize one of two equally suitable raw materials and always plan to utilize the raw material which will lead to cheapest total production costs. However PTKLL is frequently trapped by price changes and the material actually used often provides, after the event, to have been more expensive than the alternative which was originally rejected.

During last accounting period, to produce a unit of 'P' PTKLL could use either 2.50 kg of 'PG' or 2.50 kg of 'PD'. PTKLL planned to use 'PG' as it appeared it would be cheaper of the two and plans were based on a cost of 'PG' of ₹ 1.50 per kg. Due to market movements the actual prices changed and if PTKLL had purchased efficiently the cost would have been : 'PG' ₹ 2.25 per Kg; and 'PD' ₹ 2.00 per kg.

Production of 'P' was 1,000 units and usage of 'PG' amounted to 2,700 kg at a total cost of ₹ 6,480.

Required :

CALCULATE the material variance for 'P' by:

- (i) Traditional Variance Analysis; and
- (ii) An approach which distinguishes between Planning and Operational Variances.

Solution 50 :**Key Data :**

Original Standard Price = ₹ 1.50 per kg for PG

Revised Standard Price = ₹ 2.25 per kg for PG

Revised Standard Price = ₹ 2.00 per kg for PD

Actual Price of PG = ₹ 6,480 / 2700kg = ₹ 2.40 per kg for PG

Standard Qty. of input for actual output = (1,000 units x 2.5 kg) = 2,500 kg.

(i) Traditional Variance Analysis (Actual Vs Original Standard)

Usage Variance	Standard Price x (Standard Quantity – Actual Quantity)
	1.50 x [2,500 kg – 2,700 kg]
	₹ 300 (A)
Price Variance	Actual Quantity Consumed x (Standard Price – Actual Price)
	2,700 kg x (1.50 – 2.40)
	₹ 2,430 (A)
Total Cost Variance	₹ 300 (A) + ₹ 2,430 (A) = ₹ 2,730 (A)

(ii) Modern Approach of Variance Analysis (Actual Vs Revised Standard)**(a) Operational Variance - Controllable Variance**

Usage Variance	= Revised Standard Price of PG x (Std. Qty. – Actual Qty.)
	= ₹ 2.25 x (2,500 kg – 2,700 kg)
	₹ 450 (A)
Price Variance	Actual Quantity x (Revised Standard Price PG – Actual Price PG)
	2,700 kg x (2.25 – 2.40)
	₹ 405 (A)
Total Operational Variance	= ₹ 450 (A) + ₹ 405 (A) = ₹ 855 (A)

(b) Planning Variance - Uncontrollable Variance

Price Revision Variance	Standard Quantity x (Original Std. Price PG – Revised Std. Price PD)
	2,500 kg x (1.50 – 2.00)
	₹ 1,250 (A) [Due to price fluctuation]
Price Revision Variance	= Standard Qty. x (Rev. Std. price of PD - Rev. Std. price of PG)
	= 2,500 kg. x (2.00 - 2.25)
	= ₹ 625 (A) [Due to mistake in decision making]
Total Planning Variance	= ₹ 1,250 (A) + ₹ 625 (A) = ₹ 1,875 (A)

$$\begin{aligned} \text{Total Cost Variance} &= \text{Operational Variance} + \text{Planning Variance} \\ &= ₹ 855 (A) + ₹ 1,875 (A) = ₹ 2,730 (A) \end{aligned}$$

Question 51 : [RTP - May 2019]

Ski Slope had planned, when it originally designed its budget, to buy its artificial ice for ₹10 / per kg. However, due to subsequent innovations in technology, producers slashed their prices to ₹9.70 per kg. and this figure is now considered to be a general market price for the purpose of performance assessment for the budget period. The actual price paid was ₹9.50, as the Ski Slope procurement department negotiated strongly for a better price. The other information relating to that period were as follows:

Original Standards (ex-ante)	Revised Standards (ex-post)	Actual (5,500 units)
5,500 units × 5 Kgs. × ₹10 = ₹ 2,75,000	5,500 units × 4.75 Kgs. × ₹9.70 = ₹ 2,53,412.50	27,225 Kgs. × ₹ 9.50 = ₹ 2,58,637.50

Required :

- (i) CALCULATE the variances for 'Ice' by
 - (a) Traditional Variance Analysis; and
 - (b) An approach which distinguishes between Planning and Operational Variances.
- (ii) INTERPRET the result.

Solution 51 :

(i) (a) **Traditional Variances :**

$$\begin{aligned} \text{Usage Variance} &= \text{Std. Price} \times (\text{Std. Qty.} - \text{Actual Qty.}) \\ &= 10 \times (27,500 - 27,225) = ₹ 2,750 (F) \\ \text{Price Variance} &= \text{Actual Qty.} \times (\text{Std. Price} - \text{Actual Price}) \\ &= 27,225 \times (10 - 9.50) = ₹ 13,612.50 (F) \\ \text{Total Cost Variance} &= \text{Usage Variance} + \text{Price Variance} \\ &= ₹ 2,750 (F) + ₹ 13,612.50 (F) = ₹ 16,362.50 (F) \end{aligned}$$

(b) **Operational Variances : (i.e. Controllable variances)**

$$\begin{aligned} \text{Usage Variance} &= \text{Revised Std. Price} \times (\text{Revised Std. Qty.} - \text{Actual Qty.}) \\ &= 9.70 \times (26,125 - 27,225) = ₹ 10,670 (A) \\ \text{Price Variance} &= \text{Actual Qty.} \times (\text{Revised Std. Price} - \text{Actual Price}) \\ &= 27,225 \times (9.70 - 9.50) = ₹ 5,445 (F) \\ \text{Total Operational Variance} &= ₹ 10,670 (A) + ₹ 5,445 (F) = ₹ 5,225 (A) \end{aligned}$$

Planning Variances : (i.e. Uncontrollable variances)

Usage Variance = Std. Price x (Std. Qty. - Revised Std. Qty.)

$$= 10 \times (27,500 - 26,125) = ₹ 13,750 (F)$$

Price Variance = Revised Std. Qty. x (Std. Price - Revised Std. Price)

$$= 26,125 \times (10 - 9.70) = ₹ 7,837.50 (F)$$

Total Planning Variance = ₹ 13,750 (F) + ₹ 7,837.50 (F) = ₹ 21,587.50 (F)

Total Cost Variance = Total Operational Variance + Total Planning Variance

$$= ₹ 5,225 (A) + ₹ 21,587.50 (F) = ₹ 16,362.50 (F)$$

(ii) Interpretation

It is important to note that an innovation in technology is outside the control of Ski Slope and is, by nature, a planning 'error'. Equally, the better negotiation of a price should be recognised as an operational matter. Operational variances are self evidently under the control of operational management, so operational efficiency must be assessed with only these figures in mind. The material procurement department has clearly done well by negotiating a price reduction beyond the market dip. One might question the quality of the ice, as the usage variance is adverse (possibly the ice fails to cover the field and so more is required). Obviously, the favourable price variance is smaller than the adverse usage variance, thus, overall performance is quite poor. A supervisor cannot assess variances in isolation from each other.

Question 52 : [ICAI Module]

KONY Ltd. based in Kuala Lumpur, is the Malaysian subsidiary of Japan's NY corporation, headquartered in Tokyo. KONY's principal Malaysian businesses include marketing, sales, and after-sales service of electronic products & software exports products. KONY set up a new factory in Penang to manufacture and sell integrated circuit 'Q50X-N'. The first quarter's budgeted production and sales were 2,000 units. The budgeted sales price and standard costs for 'Q50X-N' were as follows:

Particulars	RM	RM
Standard Sales price per unit		50
Standard Costs per unit		
Circuit X (10 units @ RM 2.5)	25	
Circuit Designers (6 hrs. @ RM 2)	12	(37)
Standard Contribution per unit		13

Note : 'RM' is a Malaysian Currency called as "Malaysian Ringgit".

Actual results for the first quarter were as follows:

Particulars	RM '000	RM '000
Sales (2,000 units)		158
Production Costs (2,000 units)		
Circuit X (21,600 units)	97.20	
Circuit Designers (11,600 hours)	34.80	(132)
Actual Contribution (2,000 units)		26

The management accountant made the following observations on the actual results -
 "In total, the performance agreed with budget; however, in every aspect other than volume, there were huge differences. Sales were made at what was supposed to be the highest feasible price, but we now feel that we could have sold for RM 82.50 with no adverse effect on volume. The Circuit X cost that was anticipated at the time the budget was prepared was RM 2.5 per unit. However, the general market price relating to efficient purchases of the Circuit X during the quarter was RM 4.25 per unit. Circuit designers have the responsibility of designing electronic circuits that make up electrical systems. Circuit Designer's costs rose dramatically with increased demand for the specialist skills required to produce the 'Q50X-N', and the general market rate was RM 3.125 per hour – although KONY always paid below the normal market rate whenever possible. In my opinion, it is not necessary to measure the first quarter's performance through variance analysis. Further, our operations are fully efficient as the final contribution is equal to the original budget."

Required :

COMMENT on management accountant's view.

Solution 52 :

KONY India Ltd.

W.N.1 : Operating Statement for Quarter 1 :

Particulars	Favourable RM	Adverse RM	Net RM
Budgeted Contribution [2,000 units x 13]			26,000
Sales Price Variance [(RM 79 – RM 50) x 2000 units]	58,000	---	
Circuit 'X' Price Variance [(RM 2.50 – RM 4.50) x 21,600 units]		43,200	
Circuit X Usage Variance [(20,000 units – 21,600 units) x RM 2.50]		4,000	
Circuit Designer's Rate Variance [(RM 2 – RM 3) x 11,600 hrs.]		11,600	
Circuit Designer's Efficiency Variance [(12,000 hrs – 11,600 hrs) x RM 2.00]	800		NIL
Actual Contribution [Given]			26,000

W.N.2 : Statement Showing Original Standards, Revised Standards, and Actual Results for Quarter 1 :

	Original Standards (ex-ante)		Revised Standards (ex-post)		Actual	
Sales	2,000 units x RM 50.00	RM 1,00,000	2,000 units x RM 82.50	RM 1,65,000	2,000 units x RM 79.00	RM 1,58,000
Circuit X	20,000 units x RM 2.50	RM 50,000	20,000 units x RM 4.25	RM 85,000	21,600 units x RM 4.50	RM 97,200
Circuit Designer	12,000 hrs. x RM 2.00	RM 24,000	12,000 hrs. x RM 3.125	RM 37,500	11,600 hrs. x RM 3.00	RM 34,800

W.N.3 : Statement Showing Operational (Controllable) Variances :

Particulars	RM	RM
Operational Variances		
Sales Price [(RM 79.00 – RM 82.50) x 2,000 units]	7,000 (A)	16,500(A)
Circuit X Price [(RM 4.25 – RM 4.50) x 21,600 units]	5,400 (A)	
Circuit X Usage [(20,000 units – 21,600 units) x RM 4.25]	6,800 (A)	
Circuit Designer Rate [(RM 3.125 – RM 3.00) x 11,600 hrs]	1,450 (F)	
Circuit Designer Efficiency [(12,000 hrs – 11,600 hrs) x RM 3.125]	1,250 (F)	

W.N.4 : Statement Showing Planning (Uncontrollable) Variances :

Particulars	RM	RM
Sales Price [(RM 82.50 – RM 50.00) x 2,000 units]	65,000 (F)	16,500(F)
Circuit X Price [(RM 2.50 – RM 4.25) x 20,000 units]	35,000 (A)	
Circuit Designer Rate [(RM 2.00 - RM 3.125) x 12,000 hrs]	13,500 (A)	

Comments :

In order to assess the realistic performance of the company, we should distinguish between controllable factors and non-controllable factors. Hence, we need to do the variance analysis using ex-ante and ex-post standards in mind.

As the management accountant states, and the analysis (W.N.1) presents, the overall variance for the KONI is NIL. The cumulative adverse variances exactly offset the favourable variances i.e. sales price variance and circuit designer's efficiency variance. However, this traditional analysis does not clearly show the efficiency with which the KONI operated during the quarter, as it is difficult to say whether some of the variances arose from the use of incorrect standards, or whether they were due to efficient or inefficient application of those standards.

In order to determine this, a revised ex-post plan should be required, setting out the standards which should have been in operation during the quarter. These revised ex post standards are presented in W.N.2.

As can be seen from W.N.3, on the cost side, the circuit designer's rate variance has changed from adverse to favourable, and the price variance for component X, while remaining adverse, is significantly reduced in comparison to that calculated under the traditional analysis (W.N.1). On

the sales side, sales price variance, which was particularly large and favourable in the traditional analysis (W.N.1), is changed into an adverse variance in the revised approach reflecting the fact that the KONI failed to sell at prices that were actually available in the market.

Further, variances arose from changes in factors external to the business (W.N.4), which might not have been known or acknowledged by standard-setters at the time of planning and are beyond the control of the operational managers. The distinction between variances is necessary to gain a realistic measure of operational efficiency.

Question 53 : [May 2019 Exam]

GRV is a chemical processing company that produces sprays used by farmers to protect their crops. One of these sprays 'Agrofresh' is made by using either chemical A or chemical B. To produce one litre of Agrofresh spray they have the option to use either 12 litres of chemical A or 12 litres of chemical B. During the financial year, the purchase department of GRV has planned to use chemical B as it appeared that it would be the cheaper of the two and their plans were based on a cost of chemical B of ₹ 15 per litre.

Due to subsequent market movement during the year, the actual prices changed and if the concerned department had purchased efficiently, the cost would have been

Chemical A	₹ 15.40 per litre
Chemical B	₹ 16.00 per litre

Production of Agrofresh spray was 1,000 litres and the usage of chemical B was 12,800 litres at a cost of ₹ 2,09,920.

You are the CEO of GRV and the Management Accountant has sent to you the following suggestions through e-mail :

"I feel that in our particular circumstances the traditional approach to variance analysis is of little use as for some of our products we can utilize one of several equally suitable chemicals and we always plan to use such chemical which will lead to cheapest production costs. However due to sharp market movements, we are frequently trapped by the sharp price changes which lead to the choice of expensive alternative at the end."

To check the reality in the content of the mail, your CEO asked you, the Cost Accountant of the company :

- (i) To CALCULATE the material variances for Agrofresh by using
 - Traditional Variance Analysis
 - Planning and Operational Variances

(6 marks)
- (ii) To ANALYSE how planning and operational variances approached the variances.

(2 marks)
- (iii) To ANALYSE how the advanced variances are useful to your organisation.

(2 marks)

Answer 53 :

(i) **Traditional Variances :**

$$\begin{aligned}
 \text{Total Variance} &= (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP}) \\
 &= (12,000 \times 15) - (12,800 \times 16.40) \\
 &= ₹ 1,80,000 - ₹ 2,09,920 \\
 &= ₹ 29,920 \text{ (A)} \\
 \text{Usage Variance} &= \text{SP} \times (\text{SQ} - \text{AQ}) \\
 &= ₹ 15 \times (12,000 \text{ lt} - 12,800 \text{ lt}) \\
 &= ₹ 12,000 \text{ (A)} \\
 \text{Price Variance} &= \text{AQ} \times (\text{SP} - \text{AP}) \\
 &= 12,800 \text{ lt.} \times (15.00 - 16.40) \\
 &= ₹ 17,920 \text{ (A)}
 \end{aligned}$$

Operational Variances :

Hint : Use Circular Tally to derive the formulae -

$$\begin{aligned}
 \text{Revised Usage Variance} &= \text{Revised SP of B} \times (\text{SQ} - \text{AQ}) \\
 &= ₹ 16 \times (12,000 \text{ lt.} - 12,800 \text{ lt.}) \\
 &= ₹ 12,800 \text{ (A)} \\
 \text{Revised Price Variance} &= \text{AQ} \times (\text{Revised SP of B} - \text{AP of B}) \\
 &= 12,800 \text{ lt} \times (16.00 - 16.40) \\
 &= ₹ 5,120 \text{ (A)} \\
 \text{Total Operational Variance} &= \text{Rs.} 12,800 \text{ (A)} + \text{Rs.} 5,120 \text{ (A)} \\
 &= \text{Rs.} 17,920 \text{ (A)}
 \end{aligned}$$

Planning Variances :

$$\begin{aligned}
 \text{Controllable Variance} &= \text{SQ} \times (\text{Revised SP of A} - \text{Revised SP of B}) \\
 &= 12,000 \text{ lt.} \times (15.40 - 16.00) \\
 &= ₹ 7,200 \text{ (A)} \text{ [Due to error in decision making]}
 \end{aligned}$$

Student Note : In my personal opinion, this variance is uncontrollable, because we didn't know what would be the price of material in future, while taking the decision of buying A or B. But ICAI has its own interpretation. For scoring marks, you may write what ICAI likes to read. Secondly, Planning variances are by default uncontrollable variances.

$$\begin{aligned}
 \text{Uncontrollable Variance} &= \text{SQ} \times (\text{SP of B} - \text{Revised SP of A}) \\
 &= 12,000 \text{ lt} \times (15.00 - 15.40) \\
 &= ₹ 4,800 \text{ (A)} \text{ [Due to price fluctuation]} \\
 \text{Total Planning Variance} &= ₹ 7,200 \text{ (A)} + ₹ 4,800 \text{ (A)} \\
 &= ₹ 12,000 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Tally with Total Cost Variance} &= \text{Total Operational Var.} + \text{Total Planning Var.} \\
 &= ₹ 17,920 \text{ (A)} + ₹ 12,000 \text{ (A)} \\
 &= ₹ 29,920 \text{ (A)}
 \end{aligned}$$

- (ii) Traditional variance analysis is applied based on the assumption that whole of the variance is due to operational deficiencies and the planning associated with setting the original standard is perfectly correct. But this assumption is not practical. When the conditions are volatile and dynamic, traditional variances need to be analysed into planning and operational variances. Planning variances try to explain the extent to which the original standards need to be adjusted to reflect changes in operating conditions between the current situation and that imagined when the standard was originally derived. Planning variances are generally not controllable and may need to revise to cater the changes due to environmental / technological changes at a later stage. In certain situations, planning variances can be considered controllable as well. [Note : I don't agree with this sentence of ICAI]. Whereas operational variances explain the extent to which adjusted standards have been achieved. Operational variances are calculated after the planning variances have been established and are thus a realistic way of assessing performance. So, it indicates a reality check of traditional variance analysis.

In GRV, as per traditional approach total variances are ₹ 29,920 (Adverse), out of which ₹ 17,920 (Adverse) accounts for total operational variance and ₹ 12,000 (Adverse) is for total planning variance. It is necessary to analyse planning variances further. The planning variance of ₹ 12,000 (adverse) can be divided into an uncontrollable adverse variance of ₹ 4,800 and a controllable adverse variance of ₹ 7,200. Similarly, total operational variance can be sub classified as adverse price variance of ₹ 5,120 and adverse usage variances of ₹ 12,800. This analysis gives a clearer indication of the inefficiency of the purchasing function by the concerned department. Performance of the staff of the purchasing department should be evaluated / rewarded based on variances which are controllable. If an adverse uncontrollable variance of ₹ 4,800 is reported in the performance reports this is likely to lead to dysfunctional effects to the purchase department. [Note : In my personal opinion, Purchase Department is not responsible for the entire Planning Variance.]

- (iii) In today's cut-throat competition, managers must react quickly and accurately to the changes in technology, price fluctuation, consumer tastes, laws and regulations, economic conditions, political conditions and international conditions etc. which are changing rapidly and dramatically. Accordingly, management accountant should be able to provide necessary inputs by a proper analysis of the things that pertain to his/her area like effect of changes in price. The unique features of advanced variance analysis are that, it considers different market conditions and changes in the dynamic environment.

Moreover, advanced variances classify variances into controllable and uncontrollable variances and helps the management to find out reasons for adverse variances so that corrective action can be taken. Similarly, if any adverse variances have arrived, because of changes in the market condition like inflation, it has to be differentiated from the other variances.

GRV is a type of organization where management of performance can be done only through advanced variance analysis. Advanced variance analysis of GRV shows that it has adverse planning variance as well as adverse operational variance. Further, the emergence of controllable and uncontrollable variances makes it a perfect case of advanced variance analysis in GRV. Sharp price changes which lead to the choice of expensive alternative and efficiency of purchase department need to be analyzed, reported, and dealt separated by the joint effort of the management accountant and the top management. Hence, advanced variance analysis in GRV is an absolute necessity.

INVESTIGATION OF VARIANCES

Introduction :

Investigating variances is a key step in using variance analysis as part of performance management. "Interpretation may suggest possible cause of variances but investigation must arrive at definite conclusions about the cause of the variance so that action to correct the variance can be effective." There are behavioural as well as technical consequences to the decision to investigate variances. If no variances are investigated, it may cease to motivate the system which produce variances. Investigating favourable and adverse variances may create positive behavioural implications for motivation, aspiration levels and interdepartmental relationships.

Factors to be Considered When Investigating Variance

Certain set of factors should be considered before undertaking the variance investigation of the actual performance against the estimated performance.

- **Size of Variance:** A standard is seen as an average of the estimates and therefore small variations seen from the standard should be ignored and not investigated further. In addition organizations can establish limits and the variances seen beyond those limits should be undertaken for further investigation. We can treat it as the principle of materiality.
- **Type of Variance:** Adverse variance is given more importance by the organization over favorable variances seen with regards to the estimates.
- **Cost:** The costs associated with the undertaking of the investigation should be lower than the benefits associated with the investigation of variances for the organization.
- **Pattern in variance:** The variances need to be monitored over a period of time and if the variance of a particular cost is seen to be worsening over time then in that case the investigation in relation to the variance needs to be undertaken. We can say that stitch in time saves nine.
- **Budgetary process:** In case the budgetary process is uncontrollable and unrealistic then in that case the investigation should be re-evaluating the budgetary process rather than undertaking investigation of the variances.

Method Used for Investigating Variances :

1. Simple Rule of Thumb Model

It is based on arbitrary criteria such as investigating if the absolute size of a variance is greater than a certain amount or if the ratio of the variance to the total cost exceeds some predetermined percentage. They are based on managerial judgement and do not consider statistical significance.

2. Statistical Decision Model

For the statistical models, two mutually exclusive states are possible. First assumes that the system is 'In Control' and a variance is simply due to random fluctuations around the expected outcome. The second possible state is that the system is 'Out of Control' and corrective action can be taken to remedy the situation.

Note : These statistical models are now deleted from your syllabus.

INTERDEPENDENCE BETWEEN VARIANCES

It is a term used to express the way in which the cause of one variance may be wholly or partially explained by the cause of another variance. For control purposes, it might therefore be essential to look at several variances together and not in isolation.

Some examples of interdependence between variances are listed below:

- Use of cheaper material of poor quality, may lead to favourable material price variance, but this can cause more wastage of materials leading to adverse usage variance.
- Using more skilled labour to do the work will result in an adverse labour rate variance, but productivity might be higher as a result due to experienced labour and it may lead to favourable labour efficiency variance.
- Changing the composition of a team might result in a cheaper labour mix (favourable mix variance) but lower productivity (adverse efficiency variance).
- Workers trying to improve productivity (favourable efficiency variance) in order to get bonus (adverse rate variance) might use materials wastefully in order to save time (adverse materials usage).
- Cutting sales prices (adverse sales price variance) might result in higher sales demand from customers (favourable sales volume variance).
- Similarly, favourable sales price variance may result in adverse sales volume variance.
- If the workers have taken more time to do the work (i.e. adverse labour efficiency variance), it will also lead to more power consumption, higher usage of machinery, space occupied for longer period, more supervision etc. It will lead to adverse overhead efficiency variance.
- Higher utilisation of machine capacity (i.e. favourable fixed overhead capacity variance) and better labour productivity (i.e. favourable fixed overhead efficiency variance), will lead to higher production i.e. favourable fixed overhead volume variance. Etc.

INTERPRETATION OF VARIANCES

There can be a number of potential causes leading to variances in the operational costs

Material Price Variance

- Might be caused due to the use of a different supplier.
- Order size can result in variance.
- Any form of unexpected increase in buying costs such as higher delivery charges.
- Efficiency or inefficiency associated with the buying procedure adopted.
- Lack of appropriate inventory control can result in emergency purchase of material resulting in adverse variance.

Material Usage Variance

- Purchase of inferior quality material.
- Implementation of better quality control.
- Increased efficiency in production can help in bringing down wastage rate.
- Changes made in the material mix.
- Careless way of handling material by production department.
- Change in method of production/ design.
- Pilferage of material from the production department.
- Poor inspection.

Labour Cost Variance

- Unexpected increase in the pay rate of labour.
- Level of experience of the labour can impact the direct cost of labour.
- Payment of bonuses added to the direct labour costs.
- Change in the composition of the workforce can impact direct labour costs.

Labour Efficiency Variance

- Improvement in work or productivity.
- Workforce mix can have an impact upon labour efficiency levels.
- Industrial action in relation to workforce.
- Poor supervision of the workforce.
- Learning curve effect upon the labour efficiency levels.
- Resource shortages causing an unexpected delay and lowering of labour efficiency levels.
- Using inferior quality of material.
- Introduction of new machinery resulting in improvement of labour productivity levels.

Overhead Variances

- Fixed Overhead Expenditure Variance (adverse) is caused by spending in excess of the budget.
- Fixed Overhead Volume Variance is caused by changes in production volume.
- Variable Overhead Expenditure Variance is often caused by changes in machine running costs.
- Variable Overhead Efficiency Variances- Causes are similar to those for a direct labour efficiency variance.

Sales Price Variance

- Higher discounts given to customers in order to encourage bulk purchases.
- The effect of low price offers during a marketing campaign.

- Poor performance by sales personnel.
- Market conditions or economic conditions forcing changes in prices across the industry.

Sales Volume Variance

- Successful or unsuccessful direct selling efforts.
- Successful or unsuccessful marketing efforts (for example, the effects of an advertising campaign).
- Unexpected changes in customer preferences and buying patterns.
- Failure to satisfy demand due to production difficulties.
- Higher demand due to a cut in selling prices, or lower demand due to an increase in sales prices.

PROBLEM 54 : [ICAI Module]

Queensland Chemicals (QC) manufactures high-quality chemicals C-1, C-2 and C-3. Extracts from the budget for last year are given below:

Particulars	C-1	C-2	C-3
Sales Quantity (kg.)	1,000	3,250	750
	₹/ kg	₹/ kg	₹/ kg
Average Selling Price	17,600	2,560	22,400
Direct Material (C ₂ H ₆ O) Cost	8,000	1,280	9,600
Direct Labour Cost	3,200	480	4,800
Variable Overhead Cost	320	48	480

The budgeted direct labour cost per hour was ₹ 160.

Actual results for last year were as follows :

Particulars	C-1	C-2	C-3
Sales Quantity (units)	900	3,875	975
	₹/ kg	₹/ kg	₹/ kg
Average Selling Price	19,200	2,480	20,000
Direct Material(C ₂ H ₆ O) Cost	8,800	1,200	10,400
Direct Labour Cost	3,600	480	4,800
Variable Overhead Cost	480	64	640

The actual direct labour cost per hour was ₹ 150. Actual variable overhead cost per direct labour hour was ₹ 20. QC follows just in time system for purchasing and production and does not hold any inventory.

Required :

INTERPRET the Sales Mix Variance and Sales Quantity variance in terms of contribution.

PROBLEM NO. 55 : [ICAI Module]

[Similar question appeared in Nov. 2020 exam with name changed as Osaka Tea Co.]

Natural Spices manufactures and distributes high-quality spices to gourmet food shops and top quality restaurants. Gourmet and high-end restaurants pride themselves on using the freshest, highest-quality ingredients.

Natural Spices has set up five state of the art plants for meeting the ever- growing demand. The firm procures raw material directly from the centers of produce to maintain uniform taste and quality. The raw material is first cleaned, dried and tested with the help of special machines. It is then carefully grounded into the finished product passing through various stages and packaged at the firm's ultraclean factory before being dispatched to customers.

The following variances pertain to last week of operations, arose as a consequence of management's decision to lower prices to increase volume.

Sales Volume Variance	18,000 (F)
Sales Price Variance	14,000 (A)
Purchase Price Variance	10,000 (F)
Labour Efficiency Variance	11,200 (F)
Fixed Cost Expenditure Variance	4,400 (F)

Required :

- Identify the 'Critical Success Factors' for Natural Spices.
- Evaluate the management's decision with the 'Overall Corporate Strategy' and 'Critical Success Factors'.
- Interpret the variances.

Solution 55 :

- Gourmet food shops and high-end restaurants recognise Natural Spices on the basis of its high quality of spices. Therefore, quality is the most critical success factor of Natural Spices. There are other factors which cannot be ignored such as price, delivery options, attractive packing etc. But all are secondary to the quality.
- Deliberate action of cutting price to increase sales volume indicates that firm is intending to expand its market to retail segment and street shops which is price sensitive.

It appears that firm is intending to expand its market to retail market and street shops by not only reducing the price but also by compromising its quality which is opposite to its current strategy of high quality.

Management should monitor the trends of variances on regular basis and take appropriate action in case of evidence of permanent decline in quality. Here, customer feedback is also

very important. The company should stick to its Overall Corporate Strategy of maintaining high quality, else it will lose its present customers.

If the company wants to capture the price sensitive market (i.e. lower segment), then it should form another division or a subsidiary company for this purpose, so that its present market remains unaffected.

- (iii) Favourable sales volume variance and adverse sales price variance is an indication that the company is able to achieve growth in sales volume but at reduced sales prices.

Favourable Purchase Price Variance is clearly indicating that firm has purchased raw material at lower price which may be due to buying of lower quality of material. Similarly, Favourable Labour Efficiency Variance is indicating cost cutting and stretching resources.

Fixed OH Expenditure Variance is also Favourable, which indicates that the company is able to control the cost over its budgeted cost.

PROBLEM NO. 56 : [ICAI website]

[Similar question appeared in Nov. 2020 exam with name changed as KRI Sanitation Ltd.]

NZSCO Ltd. uses standard costing system for manufacturing its single product 'ANZ'. Standard Cost Card per unit is as follows:

Particulars	₹ per unit
Direct Material (1 kg per unit)	20
Direct Labour (6 hrs @ ₹ 8 per hour)	48
Variable Overheads	24

Actual and Budgeted Activity Levels in units for the month of Feb'18 are:

Particulars	Budget	Actual
Production	50,000	52,000

Actual Variable Costs for the month of Feb'18 are given as under:

Particulars	₹
Direct Material	10,65,600
Direct Labour (3,00,000 hrs)	24,42,000
Variable Overheads	12,28,000

Required : INTERPRET Direct Labour Rate and Efficiency Variances.

Solution 56 :

Approach : The question is asked only for labour rate and efficiency variance. Hence, the data relating to direct material and variable overheads is irrelevant for our calculation. For interpretation of variance, we need to calculate it first and then interpret it.

$$\begin{aligned}
 \text{Labour Rate Variance} &= \text{Actual hours} \times (\text{Standard Rate} - \text{Actual Rate}) \\
 &= 3,00,000 \times [8 - (24,42,000 / 3,00,000)] \\
 &= 3,00,000 \times [8 - 8.14] \\
 &= ₹ 42,000 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Labour Efficiency Variance} &= \text{Standard Rate} \times (\text{Standard Hours} - \text{Actual Hours}) \\
 &= 8 \times [(52,000 \text{ units} \times 6 \text{ hrs}) - 3,00,000] \\
 &= 8 \times [3,12,000 - 3,00,000] \\
 &= ₹ 96,000 \text{ (F)}
 \end{aligned}$$

Interpretation of Variances :**Direct Labour Rate Variance:**

Adverse Labour Rate Variance indicates that the workers are paid at a higher rate than the standard set. The reasons for such adverse variance may be -

- (1) While setting standard, the current/ future conditions like pending labour negotiation has not been considered (or predicted) correctly.
- (2) The workers might have been told that their wage rate will be raised or bonus will be paid if they work efficiently.

Direct Labour Efficiency Variance:

Favourable Labour Efficiency Variance indicates that the workers are working efficiently, by producing more units in less time. The reasons for favourable labour efficiency variance may be as follows -

- (1) Due to mistake in conducting time & motion study, the standards sets might be loose.
- (2) The workers may be new in the factory, hence, efficiency could not be predicated properly.
- (3) The foreman or personnel manager responsible for labour efficiency, while providing his/ her input at the time of budget/ standard, has adopted conservative approach.
- (4) The increase in the labour rate might have encouraged the workers to work more efficiently. It means, adverse labour rate variance might be responsible for favourable labour efficiency variance.
- (5) As the workers gain experience, their efficiency may improve over a period of time, due to learning effect.

REPORTING OF VARIANCES

Computation of variances and their reporting is not the final step towards the control of various elements of cost. It in fact demands an analysis of variances from the side of the executives, to ascertain the correct reasons for their occurrence. After knowing the exact reasons, it becomes their responsibility to take necessary steps so as to stop the re-occurrence of adverse variances in future. To enhance the utility of such a reporting system it is necessary that such a system of reporting should not only be prompt but should also facilitate the concerned managerial level to take necessary steps. Variance reports should be prepared after keeping in view its ultimate use and its periodicity. Such reports should highlight the essential cost deviations and possibilities for their improvements. In fact the variance reports should give due regard to the following points :-

- (i) The concerned executives should be informed about what the cost performance should have been.
- (ii) How close the actual cost performance is with reference to standard cost performance.
- (iii) The analysis and causes of variances.
- (iv) Reporting should be based on the principle of management by exception.
- (v) The magnitude of variances should also be stated.

BEHAVIOURAL ISSUES & ETHICS

Behavioural Issues :

Variance analysis may encourage short-termism due to their inherent tendency towards short-term, quantified objectives and results.

A negative perception of an organization's variance analysis process can also encourage other suboptimal behaviour among employees such as attempts to include budget slacks.

The behavioural issues connected with variance analysis could be managed by participating employees during budget setting so that they do not assess the procedure as biased. It is also vital for an organization's performance measurement system to be based on an extensive range of quantitative and qualitative measures so as to encourage management to adopt a long-term view that is aligned with an organization's strategic direction.

Ethical Issues :

Variance analysis for evaluating performance can have strong ethical consequences. For example, standard costing methods have been proposed for hospitals as a means for improving performance.

Interpretation of a favourable variance may be difficult because it either reflects insufficient treatment or compliance to just guidelines irrespective of the quality treatment being given to the patients.

In various countries, health insurance is compulsory and the hospitals are paid by the insurance companies and not by the patients. Mostly the hospitals in these countries are reimbursed for the treatment, as specified by the diagnostic related groups (DRG). Each DRG has specified standard "length of stay" and the standard cost of treatment.

If a patient leaves the hospital early, the hospital will still get the same amount from insurance company which was prescribed for the treatment. It will help the hospital to report favourable variance. However, if a patient stays longer than the specified time, then the cost of hospitalization will increase and the hospital will report adverse variance.

Can we treat it as ethically the correct way of reporting variances, irrespective of the fact that different patients may need different care and length of time to get cured for the same type of illness?

Let's take another example of teaching industry, say a commerce college. For reporting favourable variances, a teacher should complete the syllabus in shortest possible time. To increase the total revenue, the focus should be on admitting maximum number of students and to attract the students, one should give them unreasonable promises.

Students should be given more liberty and freedom and the coaching institute should take a lot of care in upholding their ego and prestige. The students should never be punished for not attending the lectures or for not doing the homework or assignments. On the contrary, a teacher should give them good marks in the internal exams and internal assignments, without actually attending the lectures.

Frequent picnics, gatherings, singing competitions, dancing events, fashion shows, cricket matches, screening of movies to be arranged by the college authorities. Awards should be given for all such competitions. This will help in making the college very popular and in a short span of time, it can expand its branches to multiple locations and cities. The promoters will make a very good amount of money.

Will it create good and responsible citizens for the country? Is the purpose of education is served? How will you rate the above practices on ethical issues, is a question mark.

Standard Costing in Contemporary Business Environment

In today's modern and contemporary business environment, it is very difficult to implement standard costing technique. The business environment is changing at a rapid pace. Internal and external environment, in which business operates, is very volatile and uncertain. In such a situation, setting the standards of performance becomes difficult and hence standard costing as a tool of performance measurement becomes ineffective.

Let's see how the modern business works :

- Production is highly automated.
- Modern environments often use ideal standards rather than current standards.
- The emphasis is on continuous improvement so pre-set standards become less useful.
- Variance analysis may not give enough details.
- Variance reports may arrive too late to solve problems.
- Products in these environments tend not to be standardized.
- Standard costs become outdated quickly.

Variance Analysis in Activity Based Costing

Variance analysis can be applied to activity costs (such as setup costs, product testing, quality testing etc.) to gain understanding into why actual activity costs vary from the planned activity costs in the budget. Interpreting cost variances for different activities requires understanding whether the costs are based on output level or batch level or product level, or facility level etc.

Activity based costing method is basically used for charging overheads costs on a more accurate basis to the cost object. In the process, we try to identify the cost of each activity and we correlate it with the cost driver. We can say that the cost of any activity is driven by cost driver and not by the number of units produced. Using this approach, we can prepare the variance analysis report for overheads cost.

We use the similar method or logic of variance analysis for activity-based costing as for traditional costing. The overhead expenditure variance can be calculated as the difference between standard rate and actual rate for the actual number of activities carried out. The overhead efficiency variance can be calculated as the difference between the actual amount of cost driver used, and the standard allowed to make the actual output. We need to multiply the difference in quantities by the standard rate per cost driver to get the rupee value of efficiency variance.

ABC approach is based on the assumption that the overheads are basically variable (but variable with the cost driver and not the units of output). The efficiency variance reports the cost impact of undertaking more or less activities than standard, and the expenditure variance reports cost impact of paying more or less than standard for the actual activities undertaken.

PROBLEM NO. 57 : [ICAI Module]

N & S Co. (NSC) is a multiple product manufacturer. NSC has identified its selling overheads and these are associated with the number of deliveries to its customers.

Particulars	Budget	Actual
Selling Overheads (₹)	4,000	3,900
Output (units)	2,000	2,100
No. of Customer Deliveries	20	19

Required :

Calculate Overhead Efficiency Variance and Expenditure Variance by adopting ABC approach.

PROBLEM NO. 58 :

PSL is a manufacturer of variety of bearings needed in automobile industry. It manufactures the bearings in batches. PSL has identified its machine set up cost and these are associated with the number of machine set ups. The following data pertain to the recent month.

Particulars	Budget	Actual
Machine set up cost (₹)	12,000	13,600
Output (units)	4,000	4,400
No. of Set ups or Batches	20	24

Required :

Calculate Overhead Efficiency Variance and Expenditure Variance by adopting ABC approach.

PROBLEM NO. 59 :

QR Ltd. is a manufacturer of specialised equipment. It purchases variety of input material and parts from various suppliers. It has identified its material procurement and handling cost and these are associated with the number of purchase requisitions. The following data pertain to the recent quarter.

Particulars	Budget	Actual
Material procurement & handling cost (₹)	3,600	3,480
Output (units)	120	110
No. of Purchase Requisitions	12	10

Required :

Calculate Overhead Efficiency Variance and Expenditure Variance by adopting ABC approach.

Question 60 : [May 2019 Exam]

Raju is Chief Financial Officer of Millets.com, an internet company that enables customer to order for delivery of different millets by accessing its website. Raju is concerned with the efficiency and effectiveness of the financial function. He collects the following information for three finance activities in 2018.

Rate per unit of Cost Driver :

Activity	Activity level	Cost Driver	Static Budget Amount (₹)	Actual Amount (₹)
Receivables	Output unit	Remittance	6.39	7.50
Payables	Batch	Invoices	29.00	28.00
Travel expenses	Batch	Travel claims	76.00	74.00

The output measure is the number of deliveries which is the same as the number of remittances.

The following additional information are also given :

Particulars	Budgeted	Actual
Number of deliveries	10,00,000	9,48,000
Delivery Batch size	5	4.468
Travel expenses Batch size	500	501.587

Required :

CALCULATE the flexible budget variances for 2018 to :

- (i) Receivable Activities (2 Marks)
 - (ii) Payable Activities (4 Marks)
 - (iii) Travel expense Activities (4 Marks)
- (Ignore fractions in all calculations)

Answer 60 :

Student Notes :

- Flexible Budget means calculation of standard cost for actual activity. Then it can be compared with actual cost to get the cost variance. It is the normal way of calculation of variances. ICAI has clubbed standard costing with activity based costing.
- Millets is a type of food grains. It means, this company will sell food grains online.

Activity-based costing, flexible-budget variances for finance function activities :

(i) Receivable Activities :

Receivables is an output unit level activity. Its flexible-budget variance can be calculated as follows:

$$\begin{aligned}
 &= \text{Flexible Budget Costs} - \text{Actual Costs} \\
 &= (\text{₹ } 6.39 \times 9,48,000) - (\text{₹ } 7.50 \times 9,48,000) \\
 &= \text{₹ } 60,57,720 - \text{₹ } 71,10,000 = \text{₹ } 10,52,280 \text{ (A)}
 \end{aligned}$$

(ii) Payable Activities : Payables is a batch level activity.

	Particulars	Static-Budget	Actual
a	Number of deliveries	10,00,000	9,48,000
b	Batch size (units per batch)	5	4.468
c	Number of batches (a / b)	2,00,000	2,12,175
d	Cost per batch	₹ 29	₹ 28
e	Total payables activity cost (c x d)	₹ 58,00,000	₹ 59,40,900

Step 1: The number of batches in which payables should have been processed

$$\begin{aligned}
 &= 9,48,000 \text{ actual units} / 5 \text{ budgeted units per batch} \\
 &= 1,89,600 \text{ batches}
 \end{aligned}$$

Step 2 : The flexible-budget amount for payables shall be

$$\begin{aligned}
 &= 1,89,600 \text{ batches} \times \text{₹ } 29 \text{ budgeted cost per batch} \\
 &= \text{₹ } 54,98,400
 \end{aligned}$$

The flexible budget variance can be computed as follows :

$$\begin{aligned}
 &= \text{Flexible Budget Costs} - \text{Actual Costs} \\
 &= (1,89,600 \times \text{₹ } 29) - (2,12,175 \times \text{₹ } 28) \\
 &= \text{₹ } 54,98,400 - \text{₹ } 59,40,900 \\
 &= \text{₹ } 4,42,500 \text{ (A)}
 \end{aligned}$$

(iii) **Travel Expense Activities** : Travel expenses is a batch level activity.

	Particulars	Static-Budget	Actual
a	Number of deliveries	10,00,000	9,48,000
b	Batch size (units per batch)	500	501.587
c	Number of batches (a / b)	2,000	1,890
d	Cost per batch	₹ 76	₹ 74
e	Total payables activity cost (cxd)	₹ 1,52,000	₹ 1,39,860

Step 1 : The number of batches in which the travel expenses should have been processed

$$= 9,48,000 \text{ actual units} / 500 \text{ budgeted units per batch}$$

$$= 1,896 \text{ batches}$$

Step 2 : The flexible budget amount for travel expenses shall be

$$= 1,896 \text{ batches} \times ₹ 76 \text{ budgeted cost per batch}$$

$$= ₹ 1,44,096$$

The flexible budget variance can be calculated as follows :

$$= \text{Flexible Budget Costs} - \text{Actual Costs}$$

$$= (1,896 \text{ batches} \times ₹ 76) - (1,890 \text{ batches} \times ₹ 74)$$

$$= ₹ 1,44,096 - ₹ 1,39,860$$

$$= ₹ 4,236 \text{ (F)}$$

Question 61 : [Nov. 2019 Exam]

SPS Limited uses activity based costing to allocate variable manufacturing overhead costs to products. The company identified three activities with the following information for last quarter :

Activity	Standard Rate	Standard Quantity per unit produced	Actual Costs	Actual Quantity
Indirect Materials	₹ 20 per kilogram	0.5 kilogram per unit	₹ 9,40,000	48,000 kilogram
Product Testing	₹ 3 per test minute	10 minutes per unit	₹ 22,50,000	7,40,000 test minutes
Energy	₹ 0.20 per minute of machine time	4 minutes of machine time per unit	₹ 70,000	3,60,000 minutes of machine time

The company produced 80,000 units in the last quarter. Company policy is to investigate all variances above 5% of the flexible budget amount for each activity.

Required :

- (i) Calculate variable overhead expenditure variance and variable overhead efficiency variance for each of the activities using activity based costing. Clearly indicate each variance as favourable or unfavourable / adverse. [6 Marks]
- (ii) Interpret the results of variable overhead efficiency variance as calculated in (i) above in respect of indirect materials and product testing activity. [2 Marks]
- (iii) Identify the variances that should be investigated according to company policy. Show calculations to support your answer. [2 Marks]

Solution 61 :**(i) Calculation of Variances :**

For Indirect Material -

$$\begin{aligned}
 \text{Variable OH Expenditure Variance} &= (\text{SRR/kg.} \times \text{Actual Qty.}) - \text{Actual OH} \\
 &= (20 \times 48,000 \text{ kg.}) - 9,40,000 \\
 &= 9,60,000 - 9,40,000 = ₹ 20,000 \text{ (F)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Variable OH Efficiency Variance} &= \text{SRR/kg.} \times (\text{Standard Qty.} - \text{Actual Qty.}) \\
 &= 20 \times [(0.5 \times 80,000) - 48,000 \text{ kg.}] \\
 &= 20 \times (40,000 - 48,000) = ₹ 1,60,000 \text{ (A)}
 \end{aligned}$$

For Product Testing -

$$\begin{aligned}
 \text{Variable OH Expenditure Variance} &= (\text{SRR/Min.} \times \text{Actual Min.}) - \text{Actual OH} \\
 &= (3 \times 7,40,000 \text{ min.}) - 22,50,000 \\
 &= 22,20,000 - 22,50,000 = ₹ 30,000 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Variable OH Efficiency Variance} &= \text{SRR/min.} \times (\text{Standard Min.} - \text{Actual Min.}) \\
 &= 3 \times [(10 \times 80,000) - 7,40,000 \text{ min.}] \\
 &= 3 \times (8,00,000 - 7,40,000) = ₹ 1,80,000 \text{ (F)}
 \end{aligned}$$

For Energy -

$$\begin{aligned}
 \text{Variable OH Expenditure Variance} &= (\text{SRR/Min.} \times \text{Actual Min.}) - \text{Actual OH} \\
 &= (0.2 \times 3,60,000 \text{ min.}) - 70,000 \\
 &= 72,000 - 70,000 = ₹ 2,000 \text{ (F)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Variable OH Efficiency Variance} &= \text{SRR/min.} \times (\text{Standard Min.} - \text{Actual Min.}) \\
 &= 0.20 \times [(4 \times 80,000) - 3,60,000 \text{ min.}] \\
 &= 0.20 \times (3,20,000 - 3,60,000) = ₹ 8,000 \text{ (A)}
 \end{aligned}$$

(ii) Interpretation of Results :**Indirect Materials**

SPS actually spent 48,000 kg. or 8,000 kg. more than the standard allowed. At a predetermined rate of ₹ 20 per kg., efficiency variance is 1,60,000 (A). Since actual quantity were higher than the standard, the variance is unfavorable. This adverse variance, could have been caused by the inferior quality, result of carelessness handling of materials by production workers or could as a result of change in methods of production, product specifications or the way in which quality of the product is checked or controlled.

Product Testing

Favorable efficiency variance amounting to ₹1,80,000 indicates that fewer testing minutes were expended during the quarter than the standard minutes required for the level of actual output. This may be due to employment of a higher skilled labor or improvement of skills of existing workforce through training and development leading to improved productivity etc.

(iii) Investigation of Variances :

Activity	Std. Cost Per unit (₹)	Flexible Budget i.e. Std. Cost of actual output (₹)	Actual cost (₹)	Actual Difference (₹)	Allowable Difference (₹)	Action
(1)	(2)	(3) = 2 x 80,000	(4)	(5) = 3 - 4	(6) = 5% x (3)	(7)
Indirect Material	10 [20 x 0.5]	8,00,000 [10 x 80,000]	9,40,000	1,40,000	40,000	Investigate
Product Testing	30 [3 x 10]	24,00,000 [30 x 80,000]	22,50,000	1,50,000	1,20,000	Investigate
Energy	0.80 [0.2 x 4]	64,000 [0.8 x 80,000]	70,000	6,000	3,200	Investigate

Learning Curve – Impact on Variances

Labour time and labour cost can be predicted using learning curve theory. The cost per unit will go on reducing with every successive unit produced. Thus, we can calculate the standard time required for actual output, using learning curve theory and then compare it with the actual time, to calculate labour efficiency variance.

Learning curve theory will apply only to manual work and not the machine oriented work or automated work. Thus, it can be used in calculation of labour cost variances.

PROBLEM NO. 62 : [ICAI Module]

City International Co. is a multiproduct firm and operates standard costing and budgetary control system. During the month of June, firm launched a new product. An extract from performance report prepared by Senior Accountant is as follows:

Particulars	Budget	Actual
Output	30 units	25 units
Direct Labour Hours	180.74 hrs.	118.08 hrs.
Direct Labour Cost	₹1,19,288	₹ 79,704

Senior Accountant prepared a performance report for new product on certain assumptions but later on he realized that this new product has similarities with other existing product of the company. Accordingly, the rate of learning should be 80% and that the learning would cease after 15 units. Other budget assumptions for the new product remain valid.

The original budget figures are based on the assumption that the labour has learning rate of 90% and learning will cease after 20 units, and thereafter the time per unit will be the same as the time taken by 20th unit. The time taken for 1st unit is 10 hours.

Required :

Show the labour cost variances that reconcile the actual labour cost figures with revised standards in as much detail as possible.

Note : The learning index values for a 90% and 80% learning curve are – 0.152 and – 0.322 respectively.

[log 2 = 0.3010, log 3 = 0.47712, log 5 = 0.69897, log 7 = 0.8451, antilog of 0.6213 = 4.181, antilog of 0.63096 = 4.275]

PROBLEM NO. 63 :

PAL Limited is considering manufacture and launch of 1000 units of a special product 'LX4' into the market.

The Direct Labour Rate budgeted is Rs. 96 per hour.

Direct labour costs are expected to reduce as the volume of output increases due to the effects of 80% learning curve (index is – 0.3219). The expected time to be taken for the first unit is 40 hours and the learning effect is expected to end after 250 units have been produced. The units produced after the first 250 units will take the same time as the 250th unit.

- (i) Calculate the standard labour hours expected over the 1000 units.
- (ii) If the actual hours were 6000, compute the labour efficiency variance for 1000 units.
- (iii) Without the learning curve application, how would you have reported the efficiency variance, taking the standard time per unit as the expected time for the first unit?

[**Note :** $250^{-0.3219} = 0.1691$; $249^{-0.3219} = 0.1693$]

Miscellaneous Issues in Variance Analysis
Variance Analysis and Throughput Accounting

In Throughput Accounting, we have discussed bottleneck resources and constraints. Our objective is to maximize throughput contribution within the given constraints (external factors) and using available limited bottleneck resources (i.e. internal factor).

Let's assume that there are total 4 machines in a machine shop namely A, B, C & D. Out of which, machine B is a bottleneck machine. Due to this bottleneck, other machines i.e. A, C & D are unable to utilise its full capacity.

If we follow traditional standard costing system, then Operators of Machine A, C & D will report adverse capacity variance, idle time variance, adverse labour efficiency variance etc. In order to avoid these adverse variances, the operators of these machines will keep on producing the goods even if, it cannot be processed by machine B. This will lead to excess inventory of work in progress and locking up of funds.

In such scenario, the traditional standard costing system will fail. We need to evolve new parameters for judging the performance under TA system. For example – we need to track the size of inventory lying in front of every machine instead of machine idleness.

Variance Analysis in Advanced Manufacturing Environment/ High-Technology Firms

The variance analysis generally applies to all types of organizations; however, high-technology firms like Audio Technology, Automotive, Computer Engineering, Electrical and Electronic Engineering, Information Technology, Medical devices, Nanotechnology, Semiconductors, Telecommunication apply the model somewhat differently.

Now much of electronic industry is highly automated. A large part of manufacturing process is computerized. In the high-technology environment that is emerging, many costs that once were largely variable have become fixed, most becoming committed fixed cost. Some high technology manufacturing organizations have found that the two largest variable costs involve materials and power to operate machines. In these companies, the emphasis of variance analysis is placed on direct materials and variable manufacturing overhead.

Much of the manufacturing labour consists of highly skilled experts / operators/ programmers etc. Their salaries and wages is largely a committed fixed cost. Firms don't want to take a risk losing such highly trained personnel even during an economic downturn. This will result into lesser direct labour and more overhead cost. For these firms labour variances may no longer be meaningful because direct labour is a committed cost, not a cost expected to vary with output.

Standard Costing in Service Sector

Standard Costing can be equally applicable for various types of service industries. For example - accountants, solicitors, dentists, hairdressers, transport companies and hotels. Service industries comprise a wide range of different businesses that differ in size and types of service provided. Standard costing and variance analysis is little tough to apply to service sector organizations as major portion of their cost is comprised of overhead expenses rather than production expenses. While in traditional variance analysis, more stress is put on the direct material and direct labour cost. Application of activity based costing can provide an effective basis for variance analysis of overheads in service sector organizations although this may need significant time and effort in the implementation of a successful MIS.

There is a need to evolve new set of standards for the purpose of evaluating performance of service industry. Most probably, one need to develop industry wise standards and variance analysis system for performance measurement. The traditional system is more suitable for manufacturing sector than service sector.

Standard Costing in Public Sector

In order to keep effective control on the cost in public sector, regular variance analysis is required. First we need to define the unit of service rendered by the public sector undertaking. Then actual unit cost should be calculated on a monthly basis and compared with estimated unit cost.

To achieve this, an elaborate accounting and information system needs to be established, which will provide relevant data for doing this comparison. If the accounting data of public sector is not maintained on accrual basis, then we need to design a new accounting system for this purpose.

There is a need to account for all the costs incurred accurately and calculate the correct cost per unit of service provided to the citizens of the country. Similarly, we should also monitor the efficiency and effectiveness of the government programmes, which are undertaken. In public sector, it is sometimes possible that an activity is carried out very efficiently, but is not effective at all. For this purpose, a separate method of standard costing needs to be developed and the concerned people should be held responsible for any adverse variances. This will ensure an effective utilisation of public money.

McDonaldization

McDonaldization is a process of rationalisation, which takes a task and breaks it down into smaller tasks. This is repeated until all tasks have been broken down to the smallest possible level. The resulting tasks are then rationalised to find the single most efficient method for completing each task. All other methods are then deemed inefficient and discarded.

The impact of McDonaldization is that standards can be more accurately set and assessed for each task. It can be easily ascertained that how much time and cost should go into each activity. The principles can be applied to many other services, such as hairdressing, dentistry, or opticians' services.

MULTIPLE CHOICE QUESTIONS

Q. 64 : The standard raw material cost for producing one unit of a finished product is Rs. 27. Standard raw material usage for every unit of finished product is 3 Kg. If 200 units were produced and Rs. 5,518 was paid for 620 kg. of raw material, then the direct material price variance is

- | | |
|-----------------|-----------------|
| (a) Rs. 62 (F) | (b) Rs. 72 (A) |
| (c) Rs. 100 (F) | (d) Rs. 100 (A) |

Q. 65 : Using the same data given in Q. 64, the direct material usage variance will be

- | | |
|-----------------|-----------------|
| (a) Rs. 200 (F) | (b) Rs. 200 (A) |
| (c) Rs. 180 (F) | (d) Rs. 180 (A) |

Q. 66 : If fixed production overheads are under absorbed by Rs. 50,000 and the actual expenditure was Rs. 55,000 less than what was budgeted, the fixed overhead volume variance is

- | | |
|----------------------|----------------------|
| (a) Rs. 1,10,000 (F) | (b) Rs. 1,05,000 (A) |
| (c) Rs. 1,10,000 (A) | (d) Rs. 1,05,000 (F) |

- Q. 67 :** The direct material usage variance for last period was Rs. 3,400 (A). What reasons could have contributed to such a variance
- (a) output was higher than budgeted
 - (b) purchase department bought poor quality material
 - (c) original standard usage was set very loose
 - (d) an inefficient machine was causing excess wastage
- Q. 68 :** During a period 850 assemblies were made with a NIL Rate Variance and Rs. 4,400 Adverse Labour Efficiency Variance. If standard labour hours per assembly are 24 and standard rate per hour is Rs. 8, then how many actual labour hours were worked?
- (a) 19,000 hours
 - (b) 20,000 hours
 - (c) 20,440 hours
 - (d) 20,950 hours
- Q. 69 :** During a period 25,600 labour hours were worked at a standard rate of Rs. 7.50 per hour. The labour efficiency variance was Rs. 8,250 (A). How many standard labour hours were produced?
- (a) 24,500 hours
 - (b) 25,000 hours
 - (c) 24,000 hours
 - (d) 25,500 hours
- Q. 70 :** Standard price of material per kg. is Rs. 20. Standard usage per unit of output is 5 kg. Actual usage for producing 100 units is 520 kg. all of which was purchased @ Rs. 22 per kg. Material price variance shall be
- (a) Rs. 1,040 (F)
 - (b) Rs. 1,040 (A)
 - (c) Rs. 400 (A)
 - (d) Rs. 400 (F)
- Q. 71 :** Using the data of Q. 70 above, Material usage variance shall be
- (a) Rs. 1,040 (F)
 - (b) Rs. 1,040 (A)
 - (c) Rs. 400 (A)
 - (d) Rs. 400 (F)
- Q. 72 :** Using the data of Q. 70 above, Material Cost variance shall be
- (a) Rs. 1,440 (F)
 - (b) Rs. 1,440 (A)
 - (c) Rs. 4,000 (A)
 - (d) Rs. 4,000 (F)
- Q. 73 :** Standard sales price of product Z is Rs. 20 p.u. It was estimated that during January 5,000 units of Z will be sold. Actual sales was 4,500 units @ Rs. 22 p.u. Sales price variance shall be
- (a) Rs. 10,000 (F)
 - (b) Rs. 10,000 (A)
 - (c) Rs. 9,000 (A)
 - (d) Rs. 9,000 (F)

Q. 74 : Using the same data of Q. 73 above, Sales volume variance shall be

- | | |
|--------------------|--------------------|
| (a) Rs. 10,000 (F) | (b) Rs. 10,000 (A) |
| (c) Rs. 9,000 (A) | (d) Rs. 9,000 (F) |

Q. 75 : Assume the std. quantity of raw material required to produce one unit of output is 5 kg. at a std. price of Rs. 10 per kg.

Actual output during a period = 2,000 units

Material Price Variance = Rs. 19,600 (A)

Material Usage Variance = Rs. 2,000 (F)

Actual price of raw material used shall be -

- | | |
|------------|------------|
| (a) Rs. 10 | (b) Rs. 12 |
| (c) Rs. 15 | (d) Rs. 20 |

Q. 76 : Assume the standard required to produce one unit of output is 3 hrs. @ Rs. 30 per hour.

Actual output during a period = 500 units

Labour Rate Variance = Rs. 3,500 (F)

Labour Efficiency Variance = Rs. 7,500 (A)

Actual rate per hour of labour shall be -

- | | |
|------------|------------|
| (a) Rs. 20 | (b) Rs. 25 |
| (c) Rs. 28 | (d) Rs. 30 |

Q. 77 : Assume budgeted sales is 4,000 units @ Rs. 50 per unit.

Sales Price Variance = Rs. 18,000 (F)

Sales Volume Variance = Rs. 20,000 (A)

Actual sales price per unit shall be -

- | | |
|------------|------------|
| (a) Rs. 50 | (b) Rs. 52 |
| (c) Rs. 55 | (d) Rs. 60 |

How to Prepare for Theory Subjects

- Select any one good study material for reading. It might be classroom notes or a good book of a good author or ICAI study material. Do not read from multiple literature.
- Refer other books or literature, only for reference purpose i.e. in case of difficulty. But select one good study material for complete reading like a text book.
- Sit with the English Dictionary of your choice.
- Read with understanding only. Don't read just for the sake of reading. It should be effective study.
- If you feel sleepy, please take a power nap of 15 minutes, wash your face and start reading again.
- Once you finish a topic, make a summary notes in a separate notebook. It should contain only important points for the purpose of revision in future.
- In future, whenever you want to revise the theory subject, you should be able to do it with the help of summary notes. It is possible, if you have done a careful reading with understanding for the first time.

How to Write Theory Paper

- Do not write a very lengthy answer to the theory question. It is not an essay writing competition.
- ICAI want you to write the answers in brief and to the point, covering all important points. You may write the answers in points format or small paragraphs or in a distinguish between format also.
- You may underline the important points while writing or may use CAPITAL letters to highlight your point.
- Please remember that use of sketch pen, highlighter, red pen, green pen etc. is not allowed. You may either use blue pen or black pen only.
- You may quote an example or case law as may be necessary to improve the quality of your answer. You may use your own language while writing the theory answers, but try to cover all the important points.
- You are not expected to remember the entire answer by heart and reproduce it as it is. It is not possible and it will kill your writing skill as well.
- In case of law and tax related papers, use the legal language, sections, case laws to illustrate your answer.
- If you don't know the answer at all, it is better to avoid the question. Don't bluff and spoil your impression. Do not waste your time and examiner's time.
- Please remember, in ICAI examination, Quality is rewarded and not the Quantity.
- Best of Luck !

Daily Time Table - for Revision Before Exam.

- Once you get a complete free time for CA study (i.e. study leave from office), then you may implement the following time table with suitable modifications, if required.
- Getting the whole day free for study is possible only in the last few months before the exam. It is the most important and crucial time.
- Last few months before the exam should be well planned and equally well executed. Stay away from all types of distractions during this period.

Tentative Time Table for Full Revision of Syllabus

Time	Plan
5:00 to 6:00 AM	Get up and get ready with bath.
6:00 to 8:30 AM	Theory Subject
8:30 to 9:00 AM	Breakfast
9:00 to 11:00 AM	Theory Subject
11:00 to 11:15 AM	Small Break
11:15 AM to 1:15 PM	Theory Subject
1:15 to 1:45 PM	Lunch Time
1:15 to 3:00 PM	Rest Time – take a nap
3:00 to 3:15 PM	Fresh up and have a cup of tea
3:15 to 5:30 PM	Practical Subject
5:30 to 6:00 PM	Relax and have some refreshing drink, check SMS, WA, FB etc. quickly.
6:00 to 8:00 PM	Practical Subject
8:00 to 9:00 PM	Dinner Time and Relaxation Time
9:00 to 11:00 PM	Practical Subject
11:00 PM	Compulsorily go to bed. You have get up early tomorrow at 5:00 AM
Key to Success	Strict Implementation of Time Table

Tentative Time Table for Self Testing

- Download the Original Question Papers from ICAI website and also the Suggested Answers of the past examinations. Now a days you get Mock Test Papers and Solutions also on the ICAI website. Get them printed i.e. hard copy.
- There are Online Test Series Portals also or Physical Test Series are conducted by some coaching institutions. Search for them.
- Use one day for one paper as mentioned in the following time table.

Time	Plan
5:00 to 6:00 AM	Get up and get ready with bath.
6:00 to 8:30 AM	Revise the subject
8:30 to 9:00 AM	Breakfast
9:00 to 11:00 AM	Revise the Subject
11:00 to 11:15 AM	Small Break
11:15 AM to 1:15 PM	Revise the Subject
1:15 to 1:45 PM	Lunch Time – Take light lunch
1:45 to 2:00 PM	Get ready for writing the exam
2:00 to 5:00 PM	Appear for the Exam Paper in one sitting
5:00 to 5:30 PM	Relax and have some refreshing drink
5:30 to 6:30 PM	Check your answer paper with the suggested answer and identify the mistakes
6:30 to 8:30 PM	Study those areas where mistake is committed
8:30 to 9:30 PM	Dinner Time and Relaxation Time
9:30 to 10:30 PM	Study those areas where mistake is committed
10:30 PM	Compulsorily go to bed. You have get up early tomorrow at 5:00 AM
Key to Success	Strict Implementation of Time Table

* * * * *

लहरों से डरकर नौका पार नहीं होती,
कोशिश करने वालों की कभी हार नहीं होती ॥

नन्हीं चींटी जब दाना लेकर चलती है,
चढ़ती दिवारों पर सौ-सौ बार फिसलती है।
मन का उत्साह, रगों में साहस भरता है,
चढ़कर गिरना, गिरकर चढ़ना न अखरता है।
आखिर उसकी मेहनत बेकार नहीं होती,
कोशिश करने वालों की कभी हार नहीं होती ॥

डुबकियाँ सिंधु में गोताखोर लगाता है,
जा-जाकर खाली हाथ लौटकर आता है।
मिलते न सहज ही मोती गहरे पानी में,
बढ़ता दुना उत्साह इसी हैरानी में।
मुठ्ठी उसकी खाली हर बार नहीं होती,
कोशिश करने वालों की कभी हार नहीं होती ॥

असफलता एक चुनौती है, स्वीकार करो,
क्या कमी रह गयी, देखो और सुधार करो।
जब तक सफल न हो, नींद चैन की त्यागो तुम,
संघर्षों का मैदान छोड़ मत भागो तुम।
कुछ किये बिना ही जय-जयकार नहीं होती,
कोशिश करने वालों की कभी हार नहीं होती ॥

हार
नहीं
होती

