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Query :

Calculation of relevant cost of Material 'B' under Alternative 1, not understood properly.

Please explain.

Solution :

(1) Material 'B' is already in stock, hence it's acquisition cost of Rs. 10 per unit is a sunk cost and hence irrelevant and ignored.

(2) Its realisable value is Rs. 18 per unit. But, we are not going to sell it, because we need it for production of 'Z'. Hence, realisable value is also irrelevant.

(3) On the contrary, we want more quantity of material 'B' for the present work of conversion of 'XY' into a specialised product and also for 'Z'. Hence, latest purchase price (i.e. replacement cost) is relevant. However, it is not available in the question, because fresh stock is not available in the market.

(4) This material won't be available for some time due to industrial dispute. Hence, it is limited now and is in short supply i.e. 'Key Factor'. If we use material 'B' for conversion of 'XY', then we won't be able to use it for production of 'Z'. Hence, we also need to consider the 'Opportunity Cost' of material 'B' along with its own cost i.e. replacement cost. But replacement cost is not given in the question. Still, we can solve it as follows :

(5) Product 'Z' can be sold at Rs. 390 per unit

Variable cost of 'Z' (excluding cost of B) is Rs. 210 per unit

Hence contribution per unit of 'Z' = 390 - 210 = Rs. 180 per unit

But we need 4 units of 'B' for 1 unit of 'Z'. It means, to earn Rs. 180 contribution, we need to use 4 units of material B. Hence, contribution per unit of B = 180/4 = Rs. 45 per unit

Hence, we have shown the relevant cost of B = 1,000 units x 45 = Rs. 45,000.

(6) Now, the main question is, in the above calculation, we have ignored the replacement cost of B and just considered the opportunity cost. Actually, it is not so.

Let's assume that replacement cost of B = Rs. 20 per unit (you can assume anything)

Variable cost of 'Z' (excluding cost of B) is Rs. 210 per unit.

Let's add the cost of 4 units of B in this cost (i.e. 20 x 4) = Rs. 80.

Now, the total variable cost of Z = 210 + 80 = Rs. 290 per unit

Revised contribution per unit of 'Z' = 390 - 290 = Rs. 100 per unit

Hence, contribution per unit of B = 100/4 = Rs. 25 per unit i.e. opportunity cost

Now, let's consider the replacement cost of B + Opportunity cost of B

i.e. Rs. 20 + Rs. 25 = Rs. 45 again

Hence, total relevant cost of B = 1,000 units x 45 = Rs. 45,000. i.e. same as earlier.

Note : Either include cost of B at both the calculations or exclude cost of B at both the calculations, the answer will be same.