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SUGGESTED SOLUTION

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SUBJECT- SCM & PE

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BRANCH - () (Date :)

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ANSWER 1:

(i) Wings International is a premium segment airline charging “full service” rates for its ticket. However, due to intense competition in the domestic market, it adopted a “low – Cost advantage” strategy. Low – cost advantage or cost leadership was achieved through following measures :

- (a) Becoming a “no – frills” airline, where the ticket included only the seat and 1 each of cabin and checked in baggage. All other facilities had to be purchased extra.
- (b) Baggage allowance reduced to economize of space within the flight and save on fuel costs.
- (c) Online ticket booking facilitated so that the number of ticket kiosks maintained by the airline were reduced.”

Cost leadership enabled it to offer “low cost” fares to the customers that was generated through (a) giving huge discounts on ticket prices and (b) yield management of ticket price based on capacity utilization of the flight. Although, due to its long – standing image as a premium airline, the transformation to a “no frills” airline could have caused confusion about the product offering in the minds of discerning traveller, who expect higher service quality. This could have eroded the customer base in this segment.

This “Low – cost advantage” strategy did not work due to the following reasons :

- (a) Price was from competitors reduced the ticket prices to levels that were unviable to Wings International.
- (b) Variable prices to fill up flight capacity worked against the airline, since it was found that these flyers, due to their immediate need, may have willing paid a higher price for the ticket than what was offered as part of the deal. These flyers were “price indifferent” which should have been used to Wings International’s advantage and not against it.
- (c) Costs of operations including fuel prices, aircraft maintenance, staff compensation, overheads such as landing fees had been rising in the recent years.

Due to the above reasons, Wings International’s venture as a low – cost airline became unviable.

(ii) Wings International plans to foray into offering its services to flyer from smaller cities. This time it has adopted a “differentiation advantages” strategy. It is marketing in the following ways as being different from its competitors :

- (a) Offering a “full service” price where high quality facilities are provided to the traveller. Facilities offered ranging from on flight meals and entertainment, better seating options, liberal baggage allowance and transfer facility etc. differentiate Wings’ airlines from its “low cost, no frills” competitors.
- (b) Ability to offer more connectivity to flyers as compared to other airlines using its unique “Hub – spoke” model. “Wings to fly anywhere, anytime” is a catchy line to present this concept to potential customers.

- (c) Ability to offer vacation packages due to strategic tie – ups with other airlines and hospitality providers like hotels, car rentals etc.
- (d) Product differentiation can also be made between the road and rail transport providers. It can be based on relative facilities offered and better connectivity, if not based on relative cost of travel.
- (e) Dedicated customer service lines providing support to customers to resolve issues.

Superior quality, customer responsiveness and innovation will enable Wings International to consolidate its position in the industry in the long run.

(iii) Management Control Report – Feed – forward Control Report

Management control is required to set performance measure to determine if the desired objectives of the company are being achieved or not. Control is required at every stage before the activity commences, while the activity is being performed and after the activity has been completed. Accordingly, control reports generated could be Feed – forward reports (prior), concurrent reports (during) and feedback reports (after).

When the management of Wings International wants to have a reporting system that enables to take preventive measures, it would need to have a “Feed – forward” control. This control will help measure the error before it actually takes places. Preventive measure can then be taken to change the operational variables to achieve the desired result. Guidelines to implement a “Feed – forward” control are as follows :

- (a) Through planning and analysis is required. In the case of Wings International, the proposal should be planned and analysed at various levels. The strategy of selection of appropriate routes, “full service” pricing, strategic partnerships, financing the proposal need to be taken at a higher level of management. Decisions relating to flight operations, procurement of supplies like fuel, marketing, human resource planning etc. can be done by the management in charge of operations.
- (b) Careful discrimination must be applied in selecting input variables. Planning and analysis should be done in an integrated fashion. There should be synergy in the thinking at an operational level and top management strategic level.
- (c) Feed forward mechanism should be kept dynamic. Wings International should keep a close watch on the government policies and its implementation in the civil aviation sector. Reporting may be done in pre – determined intervals say a monthly feed forward reporting can be decided upon. Changes to plans should be made in a timely fashion to make them relevant.
- (d) A model control system should be developed. Authority and responsibility for various functions need to be determined and clearly defined while developing this model.
- (e) Data on input variables should be collected regularly. For example, Changes in fuel prices, which form a large share of expenses, has to be tracked continuously. If the prices are expected to fluctuate widely, hedging options or long term price agreements with suppliers can be considered.
- (f) Feed – forward control requires action. At the time of implementation, the control model developed should be followed in order to establish a systematic course of operations.

(iv) Management Control Report – Feedback Control Report

These are control reports that provide feedback about the operations. It tracks the actual results with the budgeted / forecasted results. These reports in themselves do not cause a change in performance. The management has to take timely action to correct the errors and change its operations, if required.

Guideline to implement this reporting system are as follows :

- (a) Feedback report should disclose both accomplishment and responsibility. As discussed in the feed forward report, Wings International would have already put in place an organizational structure defining individual authority and responsibility. Performance should be tracked accordingly, so that individual performance can be assessed.
- (b) Feedback reports should be extracted promptly. The management has to decided the interval at which these reports need to be generated. The interval should be such, that changes required can be assessed and action can be taken in a timely manner. In the previous instance, Wings International had given autonomy to the marketing and pricing division to take decisions to meet the competitor's actions. It took five years to determine that the project was unviable. However, a timely reporting mechanism such as a feedback report should have been in place to appraise the top management about the decisions taken. This information would have enabled the top management to make an earlier assessment as to the viability of "no frills" airline.
- (c) Feedback reports should disclose trends and relationships. Trend could be customer travelling preferences, deals offered by competitors or other changes in flight operations. Relationships could be supplier relationships, customers relationships, strategic partner relationships etc. Information generated from all these areas should be collated in order to provide proper feedback to the management.
- (d) Feedback reports should disclose variations from standards. These standards could be from financial budgets or from non – financial metrics identified as key performance indicators. For example, delay in flight operations could be a non – financial metric that can be tracked against an expected standard set in the planning stage. The information metric for actual operations should be assessed in the same manner with which the standard was set. For example, a flight delay in operations could be a delay in arrival beyond 15 mins. This same standard should be used to assess actual performance.
- (e) Feedback reports should be in a standardized format. It should be easily understood and well presented to the management. Facts should be stated without ambiguity and in a standard manner.

ANSWER 2:

(A)

- (i) Assumed Quotation Price 'P', Quantity 'Q'

The Marginal Cost of a 'Wagon' is Rs. 13,60,000

(Rs. 2,20,000 × 4 Casnub Bogies + Rs. 4,80,000)

Demand Function for a 'Wagon'

$$\begin{aligned}
 P &= \text{Rs. } 17,10,000 - (\text{Rs. } 50,000/2) \times Q \\
 \text{Revenue (R)} &= Q \times [17,10,000 - 25,000 \times Q] \\
 &= 17,10,000 Q - 25,000 Q^2 \\
 \text{Marginal Revenue (MR)} &= 17,10,000 - 50,000 Q \\
 \text{Marginal Cost (MC)} &= 13,60,000
 \end{aligned}$$

Profit is Maximum where Marginal Revenue (MR) equals to Marginal Cost (MC)

$$\begin{aligned}
 17,10,000 - 50,000 Q &= 13,60,000 \\
 Q &= 7.00 \text{ units}
 \end{aligned}$$

By putting the value of 'Q' in Demand Function, value of 'P' is obtained.

$$\begin{aligned}
 P &= 17,10,000 - (50,000/2) \times Q \\
 &= 17,10,000 - 25,000 \times 7.00 \\
 &= \text{Rs. } 15,35,000
 \end{aligned}$$

At Rs. 15,35,000 unit Quotation Price of a Wagon the Eastern Company Ltd.'s profit will be Maximum.

- (ii) At CBD the Divisional Manager would ensure that Divisional Marginal Revenue should be equal to Division's Marginal Cost so that Profit can be Maximum.

$$\begin{aligned}
 \text{MR of a Casnub Bogies} &= \text{MC of Manufacturing a Casnub Bogies} \\
 3,20,000 - 2(10,000/30) \times Q &= 2,20,000 \\
 Q &= 150 \text{ units}
 \end{aligned}$$

Selling price of a Casnub Bogie 'P' is

$$\begin{aligned}
 P &= 3,20,000 - (10,000/30) \times 150 \\
 &= \text{Rs. } 2,70,000
 \end{aligned}$$

CBD will earn Maximum Profit when it will Quote Rs. 2,70,000 to the Outside Market. Since, Outside Market Quotation is Transfer Price as well, so Transfer Price to WD will be Rs. 2,70,000 and it forms part of WD's Marginal Cost.

At WD, Division Manager would ensure that Divisional Marginal Revenue should be equal to Division's Marginal Cost so that Profit can be Maximum.

$$\begin{aligned}
 \text{MR of a Wagon} &= \text{MC of Manufacturing a Wagon} \\
 17,10,000 - 50,000 \times Q &= (\text{Rs. } 2,70,000 \times 4 \text{ Casnub Bogies}) + \text{Rs. } 4,80,000 \\
 Q &= 3.00 \text{ units}
 \end{aligned}$$

Quotation Price of a Wagon 'P' should be :

$$\begin{aligned}
 P &= \text{Rs. } 17,10,000 - 25,000 \times 3.00 \\
 &= \text{Rs. } 16,35,000
 \end{aligned}$$

The unit Quotation Price of Wagon that emerges as a result of Market Based Transfer Pricing is Rs. 16,35,000.

(B)

Total Quality Management is a management philosophy. It concerns itself with managing the processes and people to make sure that the customer is satisfied at each and every stage. This means making the needs of the customer the priority, expanding the relationship beyond traditional services and incorporating the customer’s needs in the company’s business plan and corporate strategy. In TQM the concept of “quality” is perceived exclusively from the fame of reference of the customer. These customers can be internal, such as, those working in another department and there can be external customers who are the end recipients of the product or services. The organisation should attempt for continuous improvement in the quality that it delivers with the ultimate aim of achieving zero defects in this quality.

TQM should be view as an investment rather than as a cost that should be minimised.

There are many ways in which investment can be made in TQM :

- Fine – tuning the product mix,
- Fine – tuning of the processes of ensuring quality,
- Introducing employee development programmes with the nature of an academic course,
- Empowering the employees professionally and personally,
- Improving the top management commitment to quality,
- Monitoring of the performances and proper rewarding based on achievements,
- Ensuring the customer satisfaction etc.

CIMZ could provide its employees with training in the technical aspects of banking practice as well as in customer care. Customers would thus get a better service not only technically but also from a customer care perspective. This should lead to smaller customer complaints and greater customer satisfaction. It could also motivate customers to recommend others to use this bank.

TQM also requires CIMZ to respond to its customer’s requirements immediately for example by providing more staff to reduce the lengths of queues in festive / seasonal/ busy time. If Bank could also be opened for longer hours to allow customers to complete their bank related requirements and have meetings with bank employees at a time that is more convenient for the customer, this would lead to more satisfaction to customers.

In long run, if bank continue to follow TQM the bank would have higher profits and competitive advantage in banking sector despite incurring additional expenditure to improve quality.

Answer 3:

(A)

Workings

Statement Showing Benefit from Prospective Export Contract

	Rs.
Direct Material	1,500
Direct Labor (2 hrs. × Rs.40)	80
Leakage Testing	50
Variable Overheads (including packing)	214

Export Clearance Charges on FOB term	36
Total Relevant Cost	1,880
USD to INR	Rs.67
Relevant Cost	\$28.06
Price Offered by Customer	\$28.50
Benefit <i>per extinguisher</i>	\$0.44
No. of Extinguishers	20,000
Total Benefit	\$8,800

Advise

From financial perspective, it will be profitable for N2 to accept the contract because of gain of \$8,800 (Rs.5,89,600) along with export incentives of drawback. Besides this, following consideration should also be taken into consideration while exporting fire extinguishers:

Statutory Compliances

Before exporting to a foreign country or even agreeing to sell to a new customer in a foreign country, N2 should be aware of foreign laws that might affect the sale. Export documentation is important as it plays a significant role in regulating the flow and movement of goods in international markets. Each country has its own prescribed statutory documents to be complied by exporters and importers. Thus, N2 should consider about the documentation and inspection compliances part of new buyer. It may include third party audit, commercial invoice and packaging list requirements, certificate requirements like- no child labour certificate, inspection certificate, reach compliance certificate etc. If any compliance requirement is not met, what will be the consequences? There may be stiff penalty has to be paid owing to non-compliance or failure to accurately comply with the export obligation.

Buyer Creditworthiness

It is necessary that before shipment the exporter to carry out its own credit check on the importer to determine creditworthiness. Thus, N2 should make a proper assessment of the creditworthiness of the foreign buyer and spend sufficient time in cross checking the credit worthiness of his counterpart to avoid any kind of unforeseen situation in future. Such information can be easily availed through contracts or through ECGC. Private agencies also provide information on paid service basis. However, this risk can be covered by asking for LC payment terms or 100% advance or opting for post shipment insurance for goods being exported.

Industry Analysis

Industry analysis involves such things as assessing the competition in the industry; the interplay of supply and demand in the industry; how the industry holds up against other industries that are emerging and providing competitions; the likely future of the

industry, especially in light of technological developments; how credit works in the industry; and the exact extent of the impact that external factors have on the industry.

For N2, it is worthwhile to know the current and future demand of fire extinguisher and factors influencing the growth of global fire extinguisher market. N2 can perform industry analysis through three main ways i.e. the Competitive Forces Model (also known as Porter's 5 Forces); the broad factors analysis, also known as PEST analysis; and SWOT Analysis. It may also arrange industry report from trusted sources.

Additional Terms

Ensure that the all terms are clear and suit the business purpose. For instance, delivery terms should provide date of shipment or means of determining the date. In some circumstances, a late delivery penalty may be incurred where goods are not supplied by a specific delivery date. Therefore, N2 should evaluate whether shipment date is attainable or not. If the target shipment date could not be met, what will be the charges? Further, N2 must also check whether the foreign bank charges are subject to beneficiary account. If yes, then the same must be considered in the quotation.

Overall, N2 should accept the proposed contract only after due and careful consideration of above factors.

(B)

(i) ROI

Division 'Y'

Controllable Profit = Rs. 5,290K

Net Assets = Rs.19,520k + Rs. 4,960K – Rs.5,920K = Rs. 18,560K ROI = 28.5%

Division 'D'

Controllable profit = Rs. 3,940K

Net Assets = Rs. 29,960K + Rs. 6,520K – Rs. 2,800K = Rs. 33,680K ROI = 11.7%

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 current assets and the current liabilities have been taken into consideration as they are such items over which managers have complete control.

(ii) 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 Rs. 13.6 million in new equipment during the year. If this investment were not made, net assets would have been only Rs. 20.08 million and the ROI for Division 'D' would have been 19.62% resulting in payment of a bonus Rs.1,44,000 ($7 \times \text{Rs. } 21,600 = \text{Rs. } 1,51,200$; subject to maximum of Rs. 1,44,000) rather than the nothing. FAI is being penalized for making decisions which are in the best interests of his division. It is very surprising that he decided to invest where 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'. In part, one would expect this due to higher sales (almost 66% more than Division 'D') and low cash levels at Division 'Y'. Higher trade payable leads to reduction in net assets figures. 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. Non-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.

Answer 4:

(A)

Opportunity Cost of Labour – The G_2 labour has zero opportunity cost as there is no other use for the time already paid for and is available. However, XL Polymers needs to pay an additional amount for G_1 labour. This amount can be save if the special job were not there.

G ₁ labour :	
Hours Required	250
Hours Available	150
Extra Hours Needed	<u>100</u>
Cost per hour (Rs. 630/42 hrs)	Rs. 15
Opportunity Cost	<u>Rs. 1,500</u>

Thus, the 'Opportunity Cost of Labour' for completing the special job is Rs. 1,500.

Opportunity Cost of Material – XL Polymers has no alternative use for the R_1 , they must dispose of it at a cost of Rs. 1,250. Thus, XL Polymers actually saves Rs. 1,250 by using the materials for the AT Industries' special Job. Consequently, the 'Opportunity Cost of Material' is – Rs. 1,250 (i.e., the opportunity cost of this resource is negative).

The minimum price is the price at which XL Polymers just recovers its 'Opportunity Cost.'

XL Polymers's 'Total Opportunity Cost' is Rs. 250 (Rs. 1,500 – Rs. 1,250). Accordingly, minimum Price for the Special Job is Rs. 250.

(B)

Variance Interpretation

The sales quantity variance and the sales mix variance describe how the sales volume contribution variance has been affected by a change in the *total quantity of sales* and a *change in the relative mix of products sold*.

From the figures arrived for the sales quantity contribution variance, we can observe that the increase in total quantity sold would have gained an additional contribution of Rs.2,124,600, if the actual sales volume had been in the budgeted sales proportion.

The sales mix contribution variance shows that the variation in the sales mix resulted in a curtailment in profit by Rs.570,600. The change in the sales mix has resulted in a relatively higher proportion of sales of C-2 which is the chemical that earns the lowest contribution and a lower proportion of C-1 which earn a contribution significantly higher. The relative increase in the sale of C-3 however, which has the highest unit contribution, has partially offset the switch in mix to C-2.

Workings

Statement Showing Standard Contribution

	C-1 Rs./ kg	C-2 Rs./ kg	C-3 Rs./ 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
Contribution	6,080	752	7,520

Sales Contribution Mix Variance

Products	Actual Quantity [AQ]	Actual Sales at Budgeted Proportion [RAQ]	Difference [AQ - RAQ]	Contribution Rs. [SC]	Mix Variance (Rs.' 000) SC × [AQ - RAQ]
C-1	900	1,150	250 (A)	6,080	1,520 (A)
C-2	3,875	3,737.50	137.50 (F)	752	103.40 (F)
C-3	975	862.50	112.50 (F)	7,520	846 (F)
	5,750	5,750			570.60 (A)

Sales Contribution Quantity Variance

Products	Budget Sales Quantity [BQ]	Actual Sales at Budgeted Proportion [RAQ]	Difference [RAQ - BQ]	Contribution Rs. [SC]	Qty. Variance (Rs.' 000) SC × [RAQ - BQ]
C-1	1,000	1,150	150 (F)	6,080	912 (F)
C-2	3,250	3,737.50	487.50 (F)	752	366.60 (F)
C-3	750	862.50	112.50 (F)	7,520	846 (F)
	5,000	5,750			2,124.60 (F)

(C)

The Present Profit of Hotel Nikko

Total Room Days = 25 Rooms × 365 days × 75% = 6,844 Profit =

Total Contribution – Fixed Cost

$$= 6,844 \text{ room days} \times (\text{ZD } 2,700 - \text{ZD } 900) - \text{ZD } 90,00,000$$

$$= \text{ZD } 33,19,200$$

If Nikko is Shut Down during Q2

Loss of Contribution {900 Room Days × (ZD 2,700 - ZD900)} = ZD 16,20,000

Nikko should not close its hotel during Q2. The fixed costs will still be incurred and hotel closure would result in lost contribution of ZD16,20,000. This in turn would decrease annual profits by ZD16,20,000. In addition, Nikko could lose guests at other quarters of the year, particularly their regular business customers, who may perceive the Nikko as being *non-reliable*.

Proposal of Opening an Italian Restaurant

Opening a restaurant will increase the fixed costs of the Nikko from ZD 9 million p.a. to ZD 12 million p.a. Thus, annual increment of ZD 3 million.

Average Revenue per occupied room will rise from ZD 2,700 to ZD 3,636.36... (ZD 30 Million/ 8,250 rooms) because increasing guest expenditure in Italian restaurant.

The total cost predicted at a level of 8,250 occupied rooms is ZD 23.75 million which means the variable costs must be ZD 11.75 million (ZD 23.75 million – ZD 12 million fixed costs). This is a variable cost per occupied room of ZD 1,424.24... which is an increase of ZD 524.24...

Consequently, the breakeven point has gone up from 5,000 to 5,425 (as shown in the diagram) occupied rooms so the Nikko is required to sell more room nights to cover costs. However, budgeted occupancy is now 7,310 occupied room nights which is 80.11% occupancy (7,310/ 9,125). This provides a margin of safety of 1,885 occupied room nights or 25.79%. At 7,310 occupied room nights, Nikko's budgeted profit would be ZD 41,70,597 {7,310 × (ZD 3,636.36 – ZD 1,424.24) – 12 million} which is more than present budgeted profit by ZD 8,51,397. So, it is better for Nikko to go for opening an Italian Restaurant

Answer 5:

(i) **Product Wise Profitability as per Original Allocation Methodology**

(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling price	280	400	680
Direct Material (Refer Table 1)	114	186	300
Direct Labour (Refer Table 1)	76	124	200
Overheads (allocated equally)	75	75	150

Total Expenses	265	385	650
Profit	15	15	30
Profitability	5.36%	3.75%	×

Table 1: Allocation of Direct Materials and Labour as per Cost Centre and Product

Particulars	CC1			CC2			CC3			Total for the Company		
	A	B	CC Total	A	B	CC Total	A	B	CC Total	Gr. A	Gr. B	Grand Total
Direct Material	27	63	90	60	60	120	27	63	90	114	186	300
Direct Labour	18	42	60	40	40	80	18	42	60	76	124	200

Product Wise Profitability (activity based costing using environmental management accounting) requires the following **steps**:

1. Overhead expenses of Rs. 150 per kilogram of fertilizer produced be first bifurcated into incinerator costs and other overhead costs.
2. Incinerator costs of Rs. 90 per kilogram of fertilizer needs to be allocated first to the cost centres. This is done based on the waste generated at each cost centre. The individual cost allocated to each cost centre is again allocated to products based on the waste generated at each cost centre by each product. Refer part a of table 2 for detailed calculations.
3. As mentioned in the problem, other overhead costs are allocated to each product at each cost centre level equally. Refer part b of table 2 for detailed calculations.
4. The above allocations to each product at a cost centre level is then summed up to get the product wise overhead cost allocation. Refer part c of table 2 for detailed calculations.

Accordingly, the **Revised Product Profitability** would be as follows:

(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling Price	280	400	680
Less: Direct Material (refer table 1)	114	186	300
Less: Direct Labour (refer table 1)	76	124	200
Less: Overheads (refer table 2)	66	84	150
Profit	24	6	30
Profitability	8.57%	1.50%	×

Table 2 Allocation of Overhead Expenses to each Cost Centre and Product

(Figures in Rs. per kilogram of fertilizer produced)

Product Waste Produced (in tonnes per annum)	CC1	CC2	CC3	Total
Grade A	2	3	1	6
Grade B	2	2	5	9
Total Waste (in tonnes)	4	5	6	15

Incinerator Cost Allocated to Cost Centres (based on waste generated)	24	30	36	90
Other Overhead Expenses	20	20	20	60
Total Cost Centre Wise Overhead Cost	44	50	56	150
Part A: Allocation of Incinerator Cost from Cost Centre to each product (based on waste produced at each cost centre by each product)				
Product	CC1	CC2	CC3	Total
Grade A	12	18	6	36
Grade B	12	12	30	54
Total Incinerator Cost	24	30	36	90
Part B: Allocation of Other Overhead Cost from Cost Centre to each product				
Product	CC1	CC2	CC3	Total
Grade A	10	10	10	30
Grade B	10	10	10	30
Total Other Overhead Cost	20	20	20	60
Part C: Total Overhead Cost (Cost Centre and Product Wise i.e. part a + b)				
Product	CC1	CC2	CC3	Total
Grade A	22	28	16	66
Grade B	22	22	40	84
Total Overhead Cost	44	50	56	150

Summarizing Product Profitability as per both methods:

Product	(Profit in Rs. per kg of fertilizer produced)		Profit %	
	Original Method	ABC (as per EMA) Method	Original Method	ABC (as per EMA) Method
Grade A	15	24	5.36%	8.57%
Grade B	15	6	3.75%	1.50%

- (i) As summarized above, originally the profit generated from Grade A and Grade B products, was Rs. 15 per kilogram. Grade A was the more profitable product giving return of 5.36% compared to Grade B's return of 3.75%. This has been calculated by allocating overheads equally to Grade A and B.

During the year, 15 tons of waste is produced during the manufacturing process. Grade B fertilizer produces more waste that accounts for 60% of the waste. Therefore, Grade B should bear higher amount of the incinerator cost compared to Grade A. Allocation based on this premise, dramatically changes the profitability of the products. As calculated above, Grade A fertilizer, due to lower incinerator cost allocation, generates a profit of Rs. 24 per kilogram of fertilizer. Grade B's profits accordingly are lower, since the product generates more waste and has to bear a larger share of clean-up expenses. Profitability of Grade A increases to 8.57% while Grade B falls dramatically to 1.50%.

- (ii) The company can draw a number of conclusions from this analysis of overhead costs as per environmental management accounting. This analysis has helped the company reach the conclusion that Grade B fertilizer produces more waste. The company could adopt either of the following approaches:

- (a) To maintain the same level of profitability, the company can increase the price of Grade B by another Rs. 9 per kilogram. This is a 2.25% increase in the sale price of Grade B fertilizer. Depending on the market for this grade of fertilizer, the company has to decide whether to increase the price of the product. While a price increase may be possible if the company has a strong market hold, it might be difficult if competition in the market is high.

Or

- (b) The other approach, a more sustainable approach that is the aim of environmental management accounting, would be to reduce the waste produced in the manufacturing process. This analysis, has quantified the waste generated in the process. Better manufacturing techniques, could save the company incinerator costs, that would yield better profits for the company.

Answer 6:

- (i) **Analysis of the “Results”** dimension of performance as per the Fitzgerald and Moon model.

Financial Performance of Learning Horizons and Knowledgebase

The original budget had been prepared for 8,500 students, while actual enrolments are 7,850 students. At the very onset, reasons for lower enrolments have to be found and analyzed. For comparison of actual and budget, the budget of Learning Horizons has to be flexed to scale. Hence the budget needs to be scaled down to 7,850 for preparing a variance analysis.

Particulars	Learning Horizons				Knowledge base	
	Budget		Actual		Actual	
	Number	Amt.	Number	Amt.	Number	Amt.
Revenue						
(a) Private Funded						
Accounting	2,955	35,46,00,000	2,660	31,92,00,000	4,100	41,00,000,000
Law	1,847	22,16,40,000	1,785	21,42,00,000	2,500	37,50,00,000
Economics	1,478	11,82,40,000	1,050	8,40,00,000	1,200	12,00,00,000
Subtotal(a)	6,260	69,44,80,000	5,495	61,74,00,000	7,800	90,50,00,000
(b) Government Funded						
Accounting	739	5,54,25,000	1,140	8,55,00,000	---	---
Law	462	4,15,80,000	765	6,88,50,000	---	----
Economics	369	2,21,40,000	450	2,70,00,000	----	----
Subtotal (b)	1,570	11,91,45,000	2,355	18,13,50,000	-----	----
Total Revenue (a) + (b)	7,850	81,36,25,000	7,850	79,8,50,000	7,800	90,50,00,000
Expenditure						
Salaries						
Lecturers	50	2,50,00,000	50	2,75,00,000	50	3,00,00,000
Administrative staff	12	36,00,000	12	36,00,000	9	36,00,000
Subtotal of salaries	62	2,86,00,000	62	3,11,00,000	59	3,36,00,000
Tuition Material		36,94,11,765		42,00,00,000		40,00,00,000
Catering		9,42,64,706		10,00,00,000		13,00,00,000
Cleaning		98,08,824		1,00,00,000		1,50,00,000
Other Operating Costs		4,90,44,118		6,00,00,000		5,00,00,000
Depreciation		1,00,00,000		1,00,00,000		1,50,00,000

Total Expenditure		56,11,29,413		63,11,00,000		64,36,00,000
Net Profit		25,24,95,587		16,76,50,000		26,14,00,000

- (1) Original revenue budget is for 8,500 students. Actual enrolments are 7,850 students. For comparison, the budgeted revenue has also been adjusted to 7,850 students. The mix between private and government funded students is 80 : 20 as per the budget. The adjusted student strength is allocated between the courses based on the original budget student strength. For example, out of the total strength of 7,850 students, based on the budget ratio, 80% are taken to be privately funded. This works out to 6,280 students. The strength for flexible budget for accounting course will be = $(6,280 \times 4,000 / 8,500) = 2,955$ students. Likewise, the strength for flexible budget for other courses is calculated in a similar manner.
- (2) The budgeted expenses are for 8,500 students. Actual standards are 7,850. For comparison, variable costs in the budget have been adjusted for 7,850 students. Fixed costs remain the same. For example, tuition material has a budget of Rs. 40 crore for 8,500 students. This is 100% variable, therefore adjusted budget for 7,850 students would be Rs. 40 crore $/ 8,500 \times 7,850$ students. The total budgeted cost for 7,850 students is therefore 37 crore. Semi – variable costs in the budget are separated as fixed portion and variable portion for the purpose of recalculation. For example, catering cost is Rs. 10 crore for 8,500 students, of which Rs. 2.5 crore is fixed. The balance Rs. 7.5 crore is for 8,500 students are is variable. The budgeted cost per student is therefore Rs. 8,823. For 7,850 students, the variable cost works out to Rs. 6.93 crore. Adding the fixed cost, the total budget for catering for 7,850 students is Rs. 9.43 crore. Likewise, the budgeted cost for cleaning and other operating expenses is calculated in a similar manner.

Analysis of Actual Financial Performance with respect to Budget:

- (a) Originally the student strength was expected to be 8,500 in comparison to an actual number of 7,850. The reason for this shortfall in enrolment should be analyzed by looking into non – financial performance measures.
- (b) On the revenue side, actual revenue of Rs. 80 crore is marginally lower than the adjusted budget of Rs. 81.4 crore. Since the budget and actual course fee rates are the same, the reason for this difference is on account of the mix between the private and government funded students. Actual enrolments had a greater ratio of government funded students were expected to be 1,570 versus an actual of 2,355, higher by 50%. Reasons for the change in students mix form a budget of 80 : 20 to actual mix of 70 : 30 has to be analyzed.
- (c) On the expenditure side, actual costs of Rs. 63 crore is 12% more than the corresponding budget of Rs. 56 crore. The increase for salaries over budget is because a higher market rate that has to be paid for a lecturer. Given that knowledgebase also pays a higher rate, the budget may need to be amended to reflect a more realistic salary rate. The other major variance is on account of the tuition materials procured for the students. While the budget for 7,850 students is only Rs. 37 crore, the actual expenditure is Rs. 42 crore. Reasons for this large variation has to be analyzed. Reasons could reflect the quality of education imparted. If in reality better quality study materials costs more, the management has to decide whether they would be willing to incur this additional cost. This might have a further impact on the fees charged to privately funded students and the management may also want to ask for increase in the government sponsored fee rate.
- (d) Overspend is noticed in other operating costs as well, actual cost is Rs. 6 crore versus Rs. 4.9 crore budget. As mentioned in the problem, 75% of this cost is fixed in nature, amounting to Rs. 3.75 crore (75% of Rs. 5 crore original budget). This portion of the cost should remain the same irrespective of variation in student entollments. The remaining portion of the budget Rs. 1.15 crore is variable. The

actual spend is Rs. 6 crore, of which ideally Rs. 3.75 crore would be fixed. If there is any variation in fixed cost, it should be looked into. If justified, future budgets need to be adjusted to reflect the higher cost. The remaining variable portion should also be analyzed to understand the reason for the higher spend.

- (e) Overall, the impact of lower revenue and higher cost, has resulted in a shortfall of Rs. 8.48 crore (34% shortfall) as compared to the adjusted budget for 7,850 students. Action should be taken by further studying other parameters like competitor's performance and other non – financial factors like quality of education, pass rate, innovation.

Competitive Performance of Learning Horizons and Knowledgebase

The average revenue and cost per student for Learning Horizons and Knowledgebase are as below :

Average Revenue and Cost student

Particulars	Learning Horizons		Knowledge base
	Budget	Actual	Actual
Total revenue (Rs.)	81,36,25,000	79,87,50,000	90,50,00,000
Number of students	7,850	7,850	7,800
Revenue per students (Rs.)	1,03,646	1,01,752	1,16,026
Total Cost (Rs.)	56,11,29,413	63,11,00,000	64,36,00,000
Number of students	7,850	7,850	7,800
Cost per student (Rs.)	71,481	80,395	82,513

The cost per student at Learning Horizons is marginally lower than Knowledge base. However, the revenue per student at Knowledge base is much higher. Analysing the components further :

- (a) **Student Mix** : Knowledgebase has higher revenue by more than 10 crore, almost 13.3% higher compared to Learning Horizons. Reasons could be on account a higher fee rate structure at Knowledgebase as compared to Learning Horizons, where part of the fee structure is government funded at a lower rate.
- (b) **Course Rate** : Learning Horizons charges Rs. 1,20,000 per year for its accountancy course which is higher compared to Knowledgebase's rate of Rs. 1,00,000 per year. This might be a reason for a higher enrolment at Knowledgebase of 4,100 students compared to Learning Horizons enrolment of 3,800 for the same course. The management has to verify if this higher rate is sustainable.
- (c) **Course Rate** : Learning Horizons charges Rs. 1,20,000 for its law course compared to Rs. 1,50,000 at Knowledgebase. However, despite being lower, the enrolment for the course is almost the same. The management has to look at non – financial parameters related to quality, in order to improve enrolments for this course.
- (d) **Course Rate** : Learning Horizons charges Rs. 80,000 for its economics course compared to Rs. 1,00,000 at Knowledgebase. Consequently, it is able to have higher enrolment for its economics course.
- (e) Compared to Learning Horizons, Knowledgebase is incurring Rs. 2 crore lesser on tuition materials. As pointed out earlier, Learning Horizons must try to find out reasons for its higher cost and try to economize on this expense, if required.
- (f) Knowledgebase has been using freelance staff for 30 days in a year to keep its expenses lower. Therefore, although it has a higher pay scale for its lecturers, it uses a lower cost resource to meet its teaching staff requirements. Compared to 1 new recruitment by Knowledgebase, Learning horizons has 10 new recruitment during the year. Knowledgebase has substituted any shortfall in teaching staff by hiring freelancers during the year. At the same time, non – financial aspects like quality of education need to be assessed while using the service of freelancers.
- (g) The other indicator of competitive performance, the take up rate, the rate of conversion of enquiries from prospective students into enrolments for the course. Reference to the budget here is the

original budget prepared for 8,500 students, which represent the capacity that Learning Horizons wants to achieve.

Particulars	Learning Horizons		Knowledge
	Budget	Actual	Actual
Accounting – number of students	4,000	3,800	4,100
Number of enquiries	4,500	4,500	4,600
Take up rate	89%	84%	89%
Law – number of students	2,500	2,550	2,500
Number of enquiries	2,800	2,700	3,050
Take up rate	89%	94%	82%
Economics – number of students	2,000	1,500	1,200
Number of enquiries	2,200	1,600	1,225
Take up rate	91%	94%	98%
Overall – number of students	8,500	7,850	7,800
Number of enquiries	9,500	8,800	8,875
Take up rate	89%	89%	88%

The take up rate is lower for accounting course at Learning Horizons as compared to Knowledgebase. As explained in point (b), this may be attributed to the higher rate that Learning Horizons charges privately funded students. The higher rate should be justifiable.

The take up rate for law is higher compared to Knowledgebase. As explained in point (c) this could be due to the lower fee rate. Higher enrolment could indicate the popularity of the course. At the same time the comparative pass rate may have to be looked into to judge the quality of the course.

The take up rate for economics is marginally lower than Knowledgebase. However, overall enrolment for this course is much higher compared to Knowledgebase, possibly to the substantially lower rate offered for the course. The management could look at better publicity to improve the take up rate.

(ii) **Analysis of the “Determinants”** dimension of performance as per the Fitzgerald and Moon model
Quality of Service

The pass rate for each course indicates the quality of course offered. Summarizing from the problem :

Pass rate

	Learning Horizons		Knowledgebase
	Budget	Actual	Actual
Accounting	95%	99%	93%
Law	95%	98%	90%
Economics	95%	95%	95%
Overall Pass rates for the courses	95%	97%	93%

The targeted pass rate of 95% has been met in all courses, thereby it indicates that a satisfactory level of education is being imparted. In comparison with Knowledgebase the pass rate for all courses is higher, which is a good indicator. This could be a reasons to justify the use of full time staff instead of substituting it with freelancer staff.

In the case of accountancy, the management can use the higher pass rate to justify the higher course rate, which may lead to better enrolments for the course. In the case of law, it has the potential of becoming a very popular course, lower course fee with higher pass rate. This can be used to improve enrolments. In the case of economics, the pass rates are at par. The management may use the lower

course fee to attract students else may find other ways to make the course more attractive to have higher enrolments.

Feedback from current students and the institute's alumni also provide value information about the quality of the courses and opportunities to improve.

Flexibility

The management of Learning Horizons has to consider the feedback from current and prospective students in order to bring in flexibility to their services. While long distance learning offers some flexibility, the management has to look at alternate channels of delivery like online lecture support by faculty similar to the model that Knowledgebase has developed. Also, offering weekend courses could help improve enrolments. Providing the option to get an intermediate degree gives flexibility to students who are not able to cope up with the course. While this cannot be a main objective of the institute, it still can maintain its motto of imparting quality education for students of all backgrounds.

Resource Utilization

The main resource of an educational institute is its staff. Management of Learning Horizon has to look at the teacher student ratio and compare it to benchmarks of peer institutes. Learning Horizons is having a higher recruitment of 10 lecturers for the year as compared to a budget of 4 recruitments for the year. Reasons for the same need to be looked into. One reason could be a higher turnover ratio among lecturers due to lower salary paid in comparison to the market rate. In comparison, Knowledgebase has a more stable staff, having a recruitment of only 1 lecturer during the entire year. This might be due to the use of freelance teaching staff. Learning Horizon can explore options of using freelance teaching staff to meet its teaching needs, without compromising quality of education.

Innovation

From the information provided, Learning Horizons has a better quality of service in terms of pass rates. However, Knowledgebase planning to offer 6 new courses in the future. Learning Horizons has to explore options to improve on its current course offerings in order to maintain its market share.

- (iii) There is a limit to fees sponsored by the government. Currently, government funded revenue is Rs. 18 crore, almost 23% of the total revenue of 80 crore. Average actual cost per student, referring to the table above, is Rs. 80,395. Since, the government is unwilling to spend more than Rs. 75,000 per student, the management could look at target costing methods to resolve this issue. This reduction of Rs. 5,395 per student can be achieved by identifying opportunities to economize on costs. If feasible, the cost per student can be calculated for each of the courses, to identify where these economies can be achieved. This drive should encompass the administration and support services too. This, using target costing approach, the cost can be reduced below Rs. 75,000 to make government funded education profitable, within reasonable limits.