

FINAL EXAMINATION

December 2019

P-15(SCMD)
Syllabus 2016

Strategic Cost Management – Decision Making

Time Allowed : 3 Hours

Full Marks : 100

The figures in the margin on the right side indicate full marks.

Section-A

1. Choose the most appropriate answer to the following questions giving justification/
reasonable workings : 2×10=20

(i) The break-even point of a manufacturing company is ₹ 1,60,000. Fixed cost is ₹ 48,000. Variable cost is ₹ 12 per unit. The PV ratio will be :

(A) 20%

(B) 40%

(C) 30%

(D) 25%

(ii) A factory has a key resource (bottleneck) of Facility A which is available for 31,300 minutes per week. The time taken by per unit of Product X and Y in Facility A are 5 minutes and 10 minutes respectively. Last week's actual output was 4750 units of product X and 650 units of Product Y. Actual factory cost was ₹ 78,250. The throughput cost for the week would be :

(A) ₹ 75,625

(B) ₹ 76,225

(C) ₹ 77,875

(D) ₹ 79,375

(iii) In a PERT network, the optimistic time for a particular activity is 9 weeks and the pessimistic time is 21 weeks. Which one of the following is the best estimate of the standard deviation for the activity?

- (A) 12
- (B) 9
- (C) 6
- (D) 2

(iv) The higher the actual hours worked,

- (A) The lower the capacity usage ratio.
- (B) The higher the capacity usage ratio.
- (C) The lower the capacity utilization ratio.
- (D) The higher the capacity utilization ratio.

(v) X is a factory making a certain product where learning curve ratio of 80% and 90% apply respectively for two equally paid workers, A and B.

- (A) The labour cost of manufacturing the 4th product will be more for A.
- (B) The labour cost of manufacturing the 4th product will be more for B.
- (C) The labour cost is the same for the fourth product.
- (D) Nothing can be said about the specific product since learning applies ratio to the average quantity of the product.

(vi) What is the opportunity cost of making a component part in a factory given no alternative use of the capacity?

- (A) The variable manufacturing cost of the component
- (B) The total manufacturing cost of the component
- (C) The total variable cost of the component
- (D) Zero

(vii) The product of XYZ company is sold at a fixed price of ₹ 1,500 per unit. As per company's estimate, 500 units of the product is expected to be sold in the coming year. If the value of investments of the company is ₹ 15 Lakh and it has a target ROI of 15%, the target cost would be :

- (A) ₹ 930
- (B) ₹ 950
- (C) ₹ 1050
- (D) ₹ 1130

(viii) Max Ltd. 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 X for 2019-20 appears as under-

	₹
Fixed assets	5,00,000
Current assets	3,00,000
Debtors	2,00,000
Annual fixed cost of the division	8,00,000
Variable cost per unit of the product	10
Budgeted volume	4,00,000 units per year
Desired ROI	28%

Transfer price for division X is

- (A) ₹ 12.70
- (B) ₹ 10.70
- (C) ₹ 8.70
- (D) ₹ 14.70

(ix) Which of the following is not a correct match?

Activity	Cost Drivers
(A) Production scheduling	Number of production runs
(B) Despatching	No. of Despatch orders
(C) Goods receiving	Goods received order
(D) Inspection	Machine hours

- (x) A manufacturing company uses two types of materials, X and Y, for manufacture of a standard product. The following information is given :

Standard mix				Actual mix			
Materials	X	120 Kg. @ ₹ 5 =	₹ 600	112	Kg. @ ₹ 5 =	₹ 560	
	Y	80 Kg. @ ₹ 10 =	₹ 800	88	Kg. @ ₹ 10 =	₹ 880	
		200	₹ 1,400	200		₹ 1,440	
30% loss		60		25% loss	50		
		140	₹ 1,400	150		₹ 1,440	

Direct Materials Mix Variance is :

- (A) ₹ 40 (fav.)
(B) ₹ 40 (unfav.)
(C) ₹ 80 (fav.)
(D) ₹ 80 (unfav.)

Section-B

Answer any five questions.

Each Question carries 16 Marks.

16×5=80

2. (a) State with brief reason whether you would recommend an Activity Based Costing system in each of the following independent situations :
- A consultancy firm consisting of Lawyers, Accountants and Computer Engineers provides management consultancy services to clients.
 - Company X produces one product. The overhead costs mainly consist of Depreciation.
 - Company Z produces two different labour intensive products. The contribution per unit in both products is very high. The BEP is very low. All the work is carried on efficiently to meet target costs.
 - Company Y produces 4 different products using different production facilities.

1½×4=6

(b) Following is the operating results of Premier hospital for the year ended 31 March 2019 :

Particulars	₹
Revenue	1,13,88,000
Cost: Variable	26,28,000
Bed capacity cost (fixed) but varies with number of beds	45,30,000
Staff cost	35,10,000
Profit	7,20,000

The hospital charged each patient an average of ₹ 650 per day, had a capacity of 60 beds operated 24 hours per day for 365 days. The hospital has minimum departmental personnel requirements based on total annual patient days and following table gives the Salary to be paid.

Annual patient days	Salary (₹ in 000s)
10,000 - 14,000	32,00
14,001 - 17,000	33,80
17,001 - 23,725	35,10

Required :

(i) Compute the Break even patient days for the year ended 31 March, 2019.

(ii) Compute the Break even patient days for the year ended 31 March, 2020 if the hospital capacity is raised to 80 beds. Patient demand is unknown but assume that revenue per patient and cost per patient day, cost per bed, and employee salary will remain the same as for the year ended 31 March, 2019. 6+4=10

3. (a) Zenith Ltd. manufactures tablet batteries. The company is preparing a product life cycle budget for a new type of battery. Development on the new battery is to start shortly. Estimates for the new battery are as follows :

Life cycle units manufactured and sold	2,00,000
Selling price per battery	₹ 55
Life cycle costs :	
R&D and design cost	₹ 8,00,000
<i>Manufacturing :</i>	
Variable cost per battery	₹ 25
Variable cost per batch	₹ 300
Battery per batch	250
Fixed costs	₹ 12,00,000
<i>Marketing :</i>	
Variable cost per battery	₹ 3.50
Fixed costs	₹ 8,00,000
<i>Distribution :</i>	
Variable cost per batch	₹ 140
Battery per batch	100
Fixed costs	₹ 4,60,000
Customer service cost per battery (Variable)	₹ 1.70

Ignore the time value of money.

Required :

- Calculate the budgeted life cycle operating income for the new battery.
- What percentage of the budget total product life cycle costs will be incurred by the end of the R&D and design stages?
- Company's market research department estimates that reducing price by ₹ 2.50 will increase life cycle unit sales by 8%. If unit sale increases by 8%, the company plans to increase manufacturing and distribution batch sizes by 8% as well. Assume that all variable costs per battery, per batch and fixed costs will remain the same. Should the company reduce battery price by ₹ 2.50? Show your calculations.

$$5+2+5=12$$

- (b) What do you mean by Incremental cost? Is it always variable?

$$3+1=4$$

4. XY Co. has Profit Centre Divisions X and Y, marketing products X and Y respectively. Each unit of Y requires one unit of X and Y can sell a maximum of 50,000 units in the external market at a selling price of ₹ 150 per unit. X has the capacity to produce 1,00,000 units of X. The variable cost per unit is 12. Fixed costs are ₹ 7,20,000. X can sell the following quantities in the external market :

Price per unit (₹)	Demand Units
18	84,000
20	76,000
22	70,000
24	64,000
26	54,000 or less

Assume no stock build up for X or Y.

Y can purchase its requirement from the external market at ₹ 22 per unit, but has to incur a bulk transportation cost of ₹ 1,50,000 for any quantity, which will not be incurred on transfers from X.

Required :

- Assuming no demand from Y, what will be the best strategy for X?
- What will be the minimum transfer price that X will agree to if X has to supply 50,000 units to Y? What price will Y offer as the maximum?
- If Y is acceptable to partial supplies, what will be X's best strategy under no compulsion to transfer, but with the option to transfer as many units that it wants to? What will be the quantity that X will agree to transfer and the corresponding price, assuming both divisions agree to share the benefits of transfer equally?
- What is the best strategy of the company? Will the company's overall strategy differ from the individual divisions' strategy? Compute the benefits/disadvantages/indifference between the divisional best and company best strategies.

Present relevant calculations to substantiate all your answers.

2+4+3+3+4=16

Please Turn Over

5. (a) (i) Discuss briefly on the significance of Margin of Safety in the context of a business.
- (ii) The following are the data for two business units, P and Q. You are required to find out which of the two units has a better Margin of Safety.

	Unit P ₹	Unit Q ₹	
Sales Price per unit	100.00	250.00	
Variable Cost per unit	80.00	150.00	
Total Fixed Cost	1,75,000	2,25,000	
Budget Sales	1,00,000	2,50,000	4+4=8

- (b) Company XYZ produces two components (M and N) and is planning the allocation of its available resources for the next period.

75 units of component M and 60 units of component N are required to be produced but machine hour capacity is restricted to a total of 300 hours. Any deficit of components produced in-house can be made up by the purchase of any quantity of either component from an outside supplier.

The objective of company XYZ is to satisfy the requirement for components at minimum total cost. The following information is available concerning each component :

Cost (₹ per unit)	M	N
Direct materials	6.20	8.70
Direct labour	5.10	7.50
Variable production overheads	1.20	1.30
Fixed production overheads	<u>4.80</u>	<u>6.40</u>
Total	<u>17.30</u>	<u>23.90</u>
Machine hours (per unit)	2.00	3.00
Price from outside supplier (₹ per unit)	18.50	25.90

Required :

For the next period :

- (i) Calculate the variable costs of producing each component in-house.
- (ii) Calculate the extra costs of buying-in each component.
- (iii) Determine which component should have production priority. Show workings clearly and justify your conclusion.
- (iv) Calculate the number of units of each component that should be manufactured by company XYZ.

2+2+2+2=8

6. (a) An agro-based farm is planning its production for next year. The following is relating to the current year :

Products/Crops	M	N	O	P
Area occupied (acres)	125	100	150	125
Yield per acre (ton)	50	40	45	60
Selling price per ton (₹)	100	125	150	135
Variable cost per acre (₹):				
Seeds	150	125	225	200
Pesticides	75	100	150	125
Fertilizers	62.50	37.50	50	62.50
Cultivations	62.50	37.50	50	62.50
Direct wages	2,000	2,250	2,500	2,850

Fixed overhead per annum ₹ 13,44,000.

The land that is being used for the production of O and P can be used for either crop, but not for M and N. The land that is being used for the production of M and N can be used for either crop, but not for O and P. In order to provide adequate market service, the company must produce each year at least 1,000 tons of each of M and N and 900 tons each of O and P.

Required :

- (i) Determine the profit for the production mix fulfilling market commitment.
- (ii) Assuming the land could be cultivated to produce any of the four products and there was no market commitment, calculate the profit amount of most profitable crop and break-even point of most profitable crop in terms of acres and sales value.

5+3=8

Please Turn Over

- (b) Nava Bharat Industries Ltd. manufactures four products (1,2,3,4) on two machines (X and Y). The time (in minutes) to process one unit of each product on each machine is shown below :

Product		Machine	
		X	Y
1		12	26
2		15	19
3		18	30
4		10	25

The profit per unit for each product (1, 2, 3, 4) is ₹ 120, ₹ 150, ₹ 190 and ₹ 100 respectively. Product 1 must be produced on *both* machines X and Y but products 2, 3 and 4 can be produced on either machine.

Due to acute space constraints in the company's works, only one week's production is stored in 4,000 square feet of floor space where the floor space taken up by each product is 1.0, 1.5, 5.0 and 0.50 (square ft.) for products 1,2, 3 and 4 respectively.

As per customer requirements the output of Product 2 is related with that of Product 3 and over a week approximately twice as many units of product 2 should be produced as product 3.

Machine X is out of action (for maintenance/because of breakdown) 8% of the time and machine Y 10% of the time.

Required :

Assuming a working week 42 hours, formulate the problem of how to manufacture these products as a linear programme.

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7. The Following table gives data on normal time & cost and crash time & cost for a project.

Activity	Normal		Crash	
	Time (days)	Cost (₹)	Time (days)	Cost (₹)
1-2	6	600	4	1,000
1-3	4	600	2	2,000
2-4	5	500	3	1,500
2-5	3	450	1	650
3-4	6	900	4	2,000
4-6	8	800	4	3,000
5-6	4	400	2	1,000
6-7	3	450	2	800

The indirect cost per day is ₹ 100.

Required :

- (i) Draw the network and identify the critical path.
- (ii) What are the normal project duration and associated cost?
- (iii) Crash the relevant activities systematically and determine the optimum project completion time and cost. 4+2+10=16

8. Write short notes on *any four* of the following :

4×4=16

- (a) List down the situations where a product can be sold below the marginal cost.
 - (b) Price sensitivity
 - (c) Target costing
 - (d) Six sigma in quality control process
 - (e) Assignment
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