Paper 15 – Strategic Cost Management and Decision Making

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Time Allowed: 3 hours **Full Marks: 100**

Section A

1. Answer the following and each question carries 2 marks. [10×2= 20]

(i) B Ltd. Has earned net profit of ₹ 1 lakh, and its overall P/V ratio and margin of safety are 25% and 50% respectively. What is the total fixed cost of the company?
(a) ₹2,50,000 (b) ₹2,00,000 (c) ₹ 3,00,000 (d) ₹ 1,00,000

(ii) A company determines its selling price by marking up variable costs 60%. In addition, the company uses frequent selling price mark down to stimulate sales. If the mark down average 10%, what is the company's contribution margin ratio?
(a) 30.6% (b) 44% (c) 86.4% (d) None of these

(iii) If the direct labour cost is reduced by 20% with every doubling of output, what will be the cost of labour for the sixteenth unit produced as an approximate percentage of the cost of the first unit produced?
(a) 51.2% (b) 40.96% (c) 62% (d) None of these

(iv) A company has the capacity of production of 80,000 units and presently sells 20,000 units at ₹ 100 each. The demand is sensitive to selling price and it has been observed that with every reduction of ₹10 in selling price the demand is doubled. What should be the target cost at full capacity if profit margin on sale is taken as 25%?
(a) ₹75 (b) ₹ 90 (c) ₹ 60 (d) ₹ 25

(v) A company has 2,000 units of an obsolete item which are carried in inventory at the original purchase price of ₹ 30,000. If these items are reworked for ₹10,000, they can be sold for ₹18,000. Alternatively, they can be sold as scrap for ₹ 3,000 in the market. In a decision model used to analyze the reworking proposal, the opportunity cost should be taken as:
(a) ₹ 8,000 (b) ₹ 12,000 (c) ₹ 3,000 (d) ₹10,000

(vi) A company manufactures two products using common material handling facility. The total budgeted material handling cost is ₹60,000. The other details are:

	Product X	Product Y
Number of units produced	30	30
Material moves per product line	5	15
Direct labour hour per unit	200	200

Under activity based costing system the material handling cost to be allocated to product X (per unit) would be:
(a) ₹1,000 (b) ₹ 500 (c) ₹ 1,500 (d) ₹2,500

(vii)The total cost of manufacturing a component is as under at a capacity of 50,000 units of production:

	₹
Prime cost	10.00
Variable overheads	2.40
Fixed Overheads	4.00
	16.40

The selling price is ₹ 21 per unit. The variable selling and administrative expenses is 60 paise per component extra. During the next quarter only 10,000 units can be produced and sold. Management plans to shut down the plant estimating that the fixed manufacturing cost can be reduced to ₹ 74,000 per quarter. When the plant is operating, the fixed overheads are incurred at a uniform rate throughout the year. Additional costs of plant shutdown for the quarter are estimated at ₹ 14,000. The shut down pint for the quarter in units of product will be:

(a) ₹ 25,000 (b) ₹14,000 (c) ₹11,000 (d) ₹ 20,000

(viii)If the time taken to produce the first unit of a product is 4000 hrs, what will be the total time taken to produce the 5th to 8th unit of the product, when a 90% learning curve applies?

(a) 10,500 hours (b) 12,968 hours (c) 9,560 hours (d) 10,368 hours

(ix) A company operates throughput accounting system. The details of product X per unit are as under.

Selling Price	50
Material Cost	20
Conversion cost	15
Time on bottleneck resources	10 minutes

The return per hour for product X is:

(a) ₹ 210 (b) ₹300 (c) ₹ 180 (d) ₹90

(x) The information relating to the direct material cost of a company is as under:

	₹
Standard price per unit	3.60
Actual quantity purchased in units	1,600
Standard quantity allowed for actual production in units	1.450
Material price variance on purchase (favourable)	240

What is the actual purchase price per unit?

(a) ₹ 3.45 (b) ₹ 3.75 (c) ₹ 3.20 (d) ₹ 3.25

Section B

Answer any five questions from Question No. 2 to 8
Each question carries 16 marks. [5 ×16 = 80]

2. (a) A company is considering the purchase of a machine for ₹3,50,000. It feels quite confident that it can sell the goods produced by the machine as to yield an annual cash surplus of ₹1,00,000. There is however me uncertainly as to the machine working life. A recently publish Trade Association Survey shows that members of the Association have between them owned 250 of these machines and have found the lives of the machines vary as under:

No. of year of machine life	3	4	5	6	7	Total
No. of machines having given life	20	50	100	70	10	250

Assuming discount rate of 10% the net present value for each different machine life is follows:

Machine life	3	4	5	6	7
NPV (₹)	(1,01,000)	(33,000)	29,000	86,000	1,37,000

You required to advice whether the company should purchase a machine or not. [6]

2 (b) A manufacturing company currently operating at 80% capacity has received an export order from Middle East, which will utilise 40% of the capacity of the factory. The order has to be either taken in full and executed at 10% below the current domestic prices or rejected totally.

The current sales and cost data are given below.

Sales	₹16.00 lakhs.
Direct Material	₹ 5.80 lakhs.
Direct Labour	₹ 2.40 lakhs.
Variable Overheads	₹ 0.60 lakhs.
Fixed Overheads	₹ 5.20 lakhs.

The following alternatives are available to the management:

(a) Continue with domestic sales and reject the export order.
(b) Accept the export order and allow the domestic market to starve to the extent of excess of demand.
(c) Increase capacity so as to accept the export order and maintain the domestic demand by
  (i) Purchasing additional plant and increasing 10% capacity and there by increasing fixed overheads by ₹65,000 and
  (ii) Working overtime at one and half time the normal rate to meet balance of the required capacity.

You are required to evaluate each of the above alternatives and suggest the best one. [10]

3 (a) A Company manufacturing a highly successful line of cosmetics intends to diversify the product line to achieve fuller utilization of its plant capacity. As a result of considerable research made the company has been able to develop a new product called 'EMO'.

EMO is packed in tubes of 50 grams capacity and is sold to the wholesalers in cartons of 24 tubes at ₹240 per carton. Since the company uses its spare capacity for the manufacturer of EMO, no additional fixed expenses will be incurred. However, the cost account has allocated a share of ₹4,50,000 per month as fixed expenses to be absorbed by EMO as a fair share of the company's present fixed costs to the new production for costing purposes.

The company estimated the production and sale of EMO at 3,00,000 tubes per month and on this basis the following cost estimates have been developed.

	₹ per carton
Direct Materials	108
Direct Wages	72
All overheads	54
Total costs	234

After a detailed market survey the company is confident that the production and sales of EMO can be increased to 3,50,000 empty tubes and the cost of empty tubes, purchased from outside will result in a saving of 20% in material and 10% in direct wages and variable overhead costs of EMO. The price at which the outside firm is willing to supply the empty tubes is ₹1.35 per empty tube. If the company desires to manufacture empty tubes in excess of 3,00,000 tubes, new machine involving an additional fixed overheads ₹30,000 per month will have to be installed. Required-

(i) State by showing your working whether company should make or buy the empty tubes at each of the three volumes of production of EMO namely 3,00,000; 3,50,000 and 4,50,000 tubes.

(ii) At what volume of sales will it be economical for the company to install the additional equipment for the manufacture of empty tubes?

(iii) Evaluate the profitability on the sale of EMO at each, of the aforesaid three levels of output based on your decision and showing the cost of empty tubes as a separate element of cost. [10]

3 (b) The profit for the year of PIT Ltd. work out to 12.5% of the capital employed and the relevant figures are as under:

	₹
Sales	5,00,000
Direct Material	2,50,000
Direct labour	1,00,000
Variable overheads	40,000
Capital employed	4,00,000

The new sales manager who has joined the company recently estimates for the next year a profit of about 23% on the capital employed provided the volume of sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

Find out by computing in detail the cost and profit for next year, whether the proposal of sales manager can be adopted. [6]

4 (a) ANRO use traditional standard costing system. The inspection and setup costs are actually ₹ 1,760 against a budget of ₹2,000.

ABC system is being implemented and accordingly, the number of batches is identified as the cost driver for inspection and setup costs. The budgeted production is 10,000 units in batches of 1,000 units, whereas actually, 8,800 units were produced in 11 batches.

(i) Find the volume and total fixed overhead variance under the traditional standard costing system.

(ii) Find total fixed overhead cost variance under the ABC system. [10]

4 (b) One kilogram of product 'Kit' requires two chemicals A and B. The following were the details of product 'Kit' for the month of June, 2017:

(a) Standard mix Chemical 'A' 50% and Chemical 'B' 50%

(b) Standard price per kilogram of Chemical 'A' ₹12 and Chemical 'B' ₹15

(c) Actual input of Chemical 'B' 70 kilograms.

(d) Actual price per kilogram of Chemical 'A' ₹15

(e) Standard normal loss 10% of total input.

(f) Materials Cost variance total ₹650 adverse.

(g) Materials Yield variance total ₹135 adverse.

You are required to calculate:

1. Materials mix variance total
2. Materials usage Variance total
3. Materials price variance total
4. Actual loss of actual input
5. Actual input of chemical 'A'
6. Actual price per kilogram of Chemical 'B' [6]

5 (a) What is Bench trending and how does it differ from Bench Marking? [6]

5 (b) Infamach Ltd. wants to fix proper selling prices for their products 'A' and 'B' which they are newly introducing in the market. Both these products will be manufactured in Department D, which is considered as a Profit Centre.

The estimated data are as under: -

	A	B
Annual Production (unit)	1,00,000	2,00,000
Direct Materials per unit	15.00	14.00
Direct Labour per unit	9.00	6.00
(Direct Labour Hour Rate = ₹ 3)		

The proportion of overheads other than interest, chargeable to the two products are as under:

Factory overheads (50% fixed) 100% of Direct Wages. Administration overheads (100% fixed) 10% of factory costs. Selling and Distribution overheads (50% variable) ₹ 3 and ₹ 4 respectively per unit of products A and B.

The fixed capital investment in the Department is ₹50 lakhs. The working capital requirement is equivalent to 6 months stock of cost of sales of both the product. For this project a term loan amounting to ₹40 lakhs has been obtained from Financial Institutions on a interest rate of 14% per annum. 50% of the working capital needs are met by bank borrowing carrying interest at 18% per annum. The Department is expected to give a return of 20% on capital employed.

You are required to:

(i) Fix the selling price of products A and B such that the contribution per direct labour hour is the same for both the products.

(ii) Prepare a statement showing in details the overall profit that would be made by the Department.

[10]

6 (a) An automobile production line turns out about 100 cars a day, but deviations occur owing to many causes. The production is more accurately described by the probability distribution given below

Production/Day	Prob.	Production/Day	Prob.
95	0.03	101	0.15
96	0.05	102	0.10
97	0.07	103	0.07
98	0.10	104	0.05
99	0.15	105	0.03
100	0.20		
		Total	1.00

Finished cars are transported across the bay, at the end of each day, by ferry. If the ferry has space for only 101 cars, what will be the average number of cars waiting to be shipped, and what will be the average number of empty space on the boat?

[8]

6 (b) A captain of a cricket team has to allot five middle batting positions to five batsmen. The average runs scored by each batsman at these positions are as follows:

Batting Position						
Batsmen		III	IV	V	VI	VII
	A	40	40	35	25	50
	B	42	30	16	25	27
	C	50	48	40	60	50
	D	20	19	20	18	25
	E	58	60	59	55	53

Make the assignment so that the expected total average runs scored by these batsmen are maximum.

[8]

7 (a) A civil engineering firm has to bid for the construction of a dam. The activities and time estimates are given below:

Activity	Duration		
	Optimistic	Most likely	Pessimistic
1-2	14	17	25
2-3	14	18	21
2-4	13	15	18
2 – 8	16	19	28
3 – 4 (dummy)			
3 – 5	15	18	27
4 – 6	13	17	21
5 – 7 (dummy)			
5 – 9	14	18	20
6 – 7 (dummy)			
6 – 8 (dummy)			
7 – 9	16	20	41
8 – 9	14	16	22

The policy of the firm with respect to submitting bids is to bid the minimum amount that will provide a 95% of probability of at best breaking even. The fixed costs for the project are 8 lakhs and the variable costs are ₹ 9,000 everyday spent working on the project. The duration is in days and the costs are in terms of rupees. What amount should the firm bid under this policy? (You may perform the calculations on duration etc. upto two decimal places).

[10]

7(b) A Company produces the products P, Q and R from three raw materials A, B and C. One unit of product P requires 2 units of A and 3 units of B. A unit of product Q requires 2 units of B and 5 units of C and one unit of product R requires 3 units of A, 2 unit of B and 4 units of C. The Company has 8 units of material A, 10 units of B and 15 units of C available to it. Profits/unit of products P, Q and R are ₹3, ₹5 and ₹4 respectively.

(a) Formulate the problem mathematically,

(b) Write the Dual problem.

8. Write short notes on any four out of the following five questions. [4 × 4 = 16]

(a) Six Sigma

(b) Kaizen Costing

(c) The Variants of Backflush Accounting

(d) Business Process Re-engineering.

(e) Uses of Learning curve