# STRATEGIC COST MANAGEMENT

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

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

## SECTION – A (Compulsory)

**1) Choose the correct option:** **[15 × 2=30]**

**(i)** A company has estimated the following demand level of its product:

| Sales Volume (units) | 10000 | 12000 | 14000 | 16000 | 18000 |
|---|---|---|---|---|---|
| Probability | 0.10 | 0.15 | 0.25 | 0.30 | 0.20 |

It has assumed that the sales price of ₹ 6 per unit, marginal cost of ₹ 3.50 per unit, and fixed costs of ₹ 34,000. What is the probability that the company will make a profit of at least ₹ 10,000?

a) 40%
b) 75%
c) 20%
d) 35%

**(ii)** A company has a breakeven point when sales are ₹ 3,20,000 and variable cost at that level of sales are ₹ 2,00,000. How much would contribution margin increase or decrease if variable expenses are dropped by ₹30,000?

a) Increase by 9.375%
b) Decrease by 9.375%
c) Increase by 37.5%
d) Increase by 37.5%

**(iii)** The Tech Company has fixed costs of ₹400,000 and variable costs are 75% of the selling price. To realize profits of ₹100,000 from sales of 5,00,000 units, the selling price per unit-

a) must be ₹1.00
b) must be ₹4.80
c) must be ₹4.00
d) cannot be determined

**(iv)** P operates an activity-based costing (ABC) system to attribute its overhead costs to cost objects. In its budget for the year ending 31st March 2024, the company expected to place a total of 2,895 purchase orders at a total cost of ₹1,10,010. This activity and its related costs were budgeted to occur at a constant rate throughout the budget year, which is divided into 13 four-week periods. During the four-week period ended 30 June 2023, a total of 210 purchase orders were placed at a cost of ₹7,650. The over- recovery of these costs for the four-week period was:

a) ₹330
b) ₹350
c) ₹370
d) ₹390

**(v)** The information relating to the direct material cost of a company is as follows:
Standard price per unit - ₹7.20
Actual quantity purchased is 1600 units
Standard quantity allowed for actual production is 1450 units
Material price variance on purchase (Favourable) is ₹480 What is the actual purchase price per unit?
a) ₹5.50
b) ₹8.40
c) ₹7.80
d) ₹6.90

**(vi)** An Assignment problem is solved to minimise the total time required to complete three jobs on three different machines such that each job is processed by exactly one machine and each machine processes exactly one job. The minimum total processing time is found to be 480 minutes. After a few days of operation, there has been a change in the design of the second job. Due to this, the processing time of the second job is increased by 15 minutes in either of the machines. The revised minimum total processing time will be -
a) 495 minutes
b) 465 minutes
c) 480 minutes
d) None of these

**(vii)** If the value of the game is zero, then the game is known as:
a) Fair strategy
b) Pure strategy
c) Pure game
d) Mixed strategy

**(viii)** How long will it take to produce the 4th unit with 80% learning if the first unit took 75 hours?
a) 48 hours
b) 35 hours
c) 25 hours
d) 30 hours

**(ix)** Tableau is a -
a) Business Intelligence Tool
b) Visualisation Tool
c) Both (a) and (b)
d) None of the above

**(x)** Which of the following is not a primary activity of Value Chain?
a) Inbound Logistics
b) Operations
c) Service
d) Infrastructure

**(xi)** The shadow price of skilled labour for SD Ltd. is currently ₹10 per hour. What does this mean?

a) The cost of obtaining additional skilled labour is ₹10 per hour.
b) There is a hidden cost of ₹10 for each hour of skilled labour actively worked.
c) Contribution will be increased by ₹10 per hour for each extra hour of skilled labour that can be obtained.
d) The total costs will be reduced by ₹10 for each additional hour of skilled labour that can be obtained.

**(xii)** JIT relates to

a) Time Management
b) Inventory and product handling
c) Delivery systems
d) None of the above

**(xiii)** Which of the following may be the cause of Material Price Variance?

a) Change in quantity of purchase or uneconomical size of purchase order.
b) Failure to take advantage of off-season price or failure to purchase when price is cheaper.
c) Change in basic purchase price of material.
d) All of the above

**(xiv)** BPR involves a radical redesign of core business processes to improve:

a) Employee morale and retention
b) Productivity, cycle time, and quality
c) Marketing and customer loyalty
d) Organizational hierarchy only

**(xv)** A Ltd. Plans to introduce a new product and issuing the target cost approach. Projected sales revenue is ₹90,00,000 (₹45 per unit) and target costs are ₹64,00,000. What is the desired profit per unit?

a) ₹13
b) ₹17
c) ₹32
d) ₹10

## SECTION – B

**Answer any 5 questions out of 7 questions given. Each question carries 14 marks. [5 × 14 = 70]**

**2.** MN Agarwal owns a Gift-Shop, a Restaurant and a Lodge in Shillong. Typically, he operates these only during the season period of 4 months in a year. For the past season the occupancy rate in the Lodge was 90% and level of activity in case of Gift-Shop and Restaurant was 80%. The relevant data for the past season were as under-

(Amounts in ₹)

| | Gift-Shop | | Restaurant | | Lodge | |
|---|---|---|---|---|---|---|
| | Amount (₹) | % | Amount (₹) | % | Amount (₹) | % |
| 1. Receipts/ Sales | 48,000 | 100 | 64,000 | 100 | 1,80,000 | 100 |
| 2. Expenditure: | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cost of Sales | 26,400 | 55 | 35,200 | 55 | - | - |
| Supplies | 2,400 | 5 | 6,400 | 10 | 14,400 | 8 |
| Insurance & Taxes | 1,920 | 4 | 6,400 | 10 | 36,000 | 20 |
| Depreciation | 2,880 | 6 | 8,000 | 12.50 | 39,600 | 22 |
| Salaries | 4,800 | 10 | 4,800 | 7.50 | 25,200 | 14 |
| Electricity Charges | 960 | 2 | 3,200 | 5 | 13,500 | 7.50 |
| Total | 39,360 | 82 | 64,000 | 100 | 1,28,700 | 71.50 |
| 3. Profit | 8,640 | 18 | - | - | 51,300 | 28.50 |

Additional information:

(i) Cost of Sales and Supplies vary directly with the occupancy rate in case of Lodge and level of activity in case of Gift Shop and Restaurant.

(ii) Insurances and Taxes and Depreciation are for the entire period of twelve months.

(iii) Salaries paid are for the season period except a Chowkidar for the Lodge who is paid for the full year at ₹400 per month.

(iv) Electricity Charges include Fixed Charges of ₹640, ₹1,920 and ₹9,900 for Gift-shop, Restaurant and Lodge respectively.

The balance amount varies directly with occupancy rate in case of Lodge and level of activity in case of Gift-Shop and Restaurant. Fixed Electric Charges are for the season except in case of Lodge where ₹6,900 is for the season and ₹3,000 for the entire period of twelve months.

Mr. Agarwal is interested in increasing his Net Income. The following options are under consideration -

**I.** To continue the operations during the season period only by inserting advertisement in newspapers thereby occupancy rate to reach 100% in case of Lodge and 90% level of activity in respect of Gift-Shop and Restaurant. The costs of advertisement are estimated at ₹12,000.

**II.** To continue operations throughout the entire period of twelve months comprising season period of four months and off-season period of eight months. The occupancy rate is expected at 90% and 40% during season period and off-season period respectively in case of the Lodge. The room rents are bound to be reduced to 50% of the original rates during off-season period. The level of activity of Gift-Shop and Restaurant is expected at 80% and 30% during season and off-season period respectively but 5% discount on the original rates will have to be offered during off-season period.

Which option is profitable? As a Cost Accountant would you like to suggest him any other alternative based upon the above figures, which can be adopted to earn more net profit? (Use Incremental Revenue and Cost Approach.) **[14]**

**3. (a)** XY Co. has Profit Centre Divisions X and Y, making 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 to 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:

(i) Assuming no demand from Y, discuss the best strategy for X?

(ii) Calculate 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?

(iii) 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?

(iv) 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. **[7]**

**(b)** ABC Enterprises has prepared a draft budget for one of its products for the next year as follows:

| Quantity | 10,000 units |
|---|---|
| | (₹) |
| Sales price per unit | 300 |
| Variable costs per unit: | |
| Direct materials | 80 |
| Direct labour (2 hrs × 30) | 60 |
| Variable overhead (2 hrs × 5) | 10 |
| Contribution per unit | 150 |
| Budgeted contribution | 15,00,000 |
| Budgeted fixed costs | 14,00,000 |
| Budgeted profit | 1,00,000 |

The Board of Directors is dissatisfied with this budget, and asks working party to come up with alternate budget with higher target profit figures.

The working party reports back with the following suggestions that will lead to budgeted profit of ₹2,50,000. The company should spend ₹2,46,000 on advertising, & set the target sales price up to ₹316.75 per unit. It is expected that the sales volume will also rise, in-spite of the price rise, to 12,000 units.

In order to achieve the extra production capacity, however, the workforce must be able to reduce the time taken to make each unit of the product. It is proposed to offer a pay and productivity deal in which the wage rate per hour is increased to ₹40. The hourly rate for variable overhead will be unaffected. Calculate the target labour time required to achieve the target profit. **[7]**

**4.** **(a)** T Ltd, produces a product which passes through two processes - cutting and finishing.

The following information is provided:

| | Cutting | Finishing |
|---|---|---|
| Hours available per annum | 50,000 | 60,000 |
| Hours needed per unit of product | 5 | 12 |
| Fixed operating costs per annum excluding direct material (₹) | 10,00,000 | 10,00,000 |

The selling price of the product is ₹1,000 per unit and the only variable cost per unit is direct material, which costs ₹ 400 per unit. There is demand for all units produced.

Evaluate each of the following proposals independent of each other:

(i) An outside agency is willing to do the finishing operation of any number of units between 5,000 and 7,000 at ₹ 400 per unit.

(ii) Another outside agency is willing to do the cutting operation of 2,000 units at ₹ 200 per unit

(iii) Additional equipment for cutting can be bought for ₹10,00,000 to increase the cutting facility by 50,000 hours, with annual fixed costs increased by ₹ 2 lakhs. **[7]**

**(b)** What do you mean by lean accounting. Discuss the principles that guide lean accounting. **[7]**

**5.** **(a)** A brass foundry making castings which are transferred to the machine shop of the company at standards in regard to material stocks which are kept at standard price are as follows:

Standard Mixture 70% Material C; 30% Material Z

Standard Price Material C ₹ 2,400 per ton; Material Z ₹ 650 per ton

Standard loss in melting 5% of input

Figures in respect of a costing period are as follows:

| | | | |
|---|---|---|---|
| Commencing stocks | Material C | 100 tons | |
| | Material Z | 60 tons | |
| Finishing stocks | Material C | 110 tons | |
| | Material Z | 50 tons | |
| Purchases | Material C | 300 tons | Cost ₹ 7,32,500 |
| | Material Z | 100 tons | Cost ₹ 62,500 |
| Metal melted | 400 tons | | |
| Casting produced | 375 tons | | |

Calculate Material Price, Mixture, and Yield Variance. **[7]**

**(b)** Calculate the missing data indicated by the Question marks from the following.

| | Product 'R' | Product 'S' |
|---|---|---|
| Sales quantity | | |
| Std.(units) | ? | 400 |
| Actual (Units) | 500 | ? |

| | Product 'R' | Product 'S' |
|---|---|---|
| Price (Unit) | | |
| Standard | ₹ 12 | ₹ 15 |
| Actual | ₹ 15 | ₹ 20 |
| Sales price variance | ? | ? |
| Sales volume variance | ₹ 1,200 F | ? |
| Sales value variance | ? | ? |

Sales mix variance for both the products together was ₹ 450 F. 'F' denotes Favourable. **[7]**

**6.** **(a)** A retired person has plans to invest in shares. He has been suggested by one of his friends who plays in the share market to invest in two shares A and B which gives dividends @ 12% and 4% p.a respectively. For an investment of ₹1, the growth in the market value of the shares A and B are respectively 10 paise and 40 paise in one year. The retired person wants to invest such that the dividend income is at least ₹600 p.a and the growth of initial investment in one year is at least ₹1000.

(i) Formulate it as a Linear Programming Problem.

(ii) Write its Dual.

(iii) Solve the Dual using Simplex Method. Interpret the solution. **[7]**

**(b)** A company has taken on rent three floors (1st, 2nd and 3rd) of a multi storied building for their city office. It has been decided to locate Managers of Marketing, Purchase, HR, Finance and Company Secretary in the office. The management has earmarked in different floors five rooms having numbers 103, 201, 205, 302 and 304 for the above-mentioned Managers. But no particular room has been allotted for any particular Manager and rather they have given option to indicate their preference of rooms so that decision can be taken by the management using some scientific method and subsequently arrangement of sitting of the subordinates of various Managers can be made. Managerial preferences are provided in the table below with 1st preference appearing in the top for each and every Manager.

| Preference of Rooms of different Managers | | | | |
|---|---|---|---|---|
| Marketing Manager | Purchase Manager | HR Manager | Finance Manager | Company Secretary |
| 302 | 302 | 103 | 302 | 201 |
| 103 | 304 | 201 | 205 | 302 |
| 304 | 205 | 304 | 304 | 304 |
| | 201 | 205 | 103 | |
| | | 302 | | |

It is evident that most of the Managers have not given preference for all the available rooms because they feel that all the rooms do not have the facility they are looking for. Assuming that the preferences can be quantified by numbers, assess which manager should be assigned with which room to minimise the preferential measure. **[7]**

**7. (a)** A Small retailer has studied the weekly receipts and payments over the past 200 weeks and has developed the following set of information

| Weekly Receipts (₹) | Probability | Weekly Payments (₹) | Probability |
|---|---|---|---|
| 3000 | 0.20 | 4000 | 0.30 |
| 5000 | 0.30 | 6000 | 0.40 |
| 7000 | 0.40 | 8000 | 0.20 |
| 12000 | 0.10 | 10000 | 0.10 |

Using the following set of random numbers, simulate the weekly pattern of receipts and payments for the 12 weeks of the next quarter, assuming further that the beginning bank balance is ₹ 8000. What is the estimated balance at the end of the 12-week period? What is the highest weekly balance during the quarter? Calculate the average weekly balance for the quarter?

Random Numbers

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| For Receipts | 03 | 91 | 38 | 55 | 17 | 46 | 32 | 43 | 69 | 72 | 24 | 22 |
| For Payments | 61 | 96 | 30 | 32 | 03 | 88 | 48 | 28 | 88 | 18 | 71 | 99 |

**[7]**

**(b)** 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% 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.

Calculate the amount the firm should bid under this policy. (You may perform the calculations on duration etc. up to two decimal places.) **[7]**

**8.** **(a)** A company produces two products x and y. The total Profit (in ₹ '000) earned by the company is expressed algebraically by the function $P = 100x - x^2 - 2xy + 200y - 3y^2$. Find the Profit maximizing quantities of the products. Also calculate the maximum Profit. **[7]**

**(b)** Apply the Moving Average Method to find trend values of the following year wise data of Goods carried by a fleet of trucks of a Transport Company having pan India network using the Moving Average Method. [Assume a 4 yearly cycle]

| Year | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Goods carried (Tons) | 2204 | 2500 | 2360 | 2680 |
| Year | 2016 | 2017 | 2018 | 2019 |
| Goods carried (Tons) | 2424 | 2634 | 2904 | 3098 |
| Year | 2020 | 2021 | 2022 | 2023 |
| Goods carried (Tons) | 3172 | 2952 | 3248 | 3172 |

**[7]**