FINAL EXAMINATION

June 2024 *P–16(SCM)*
Syllabus 2022

STRATEGIC COST MANAGEMENT

Time Allowed: 3 Hours Full Marks: 100

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

All working notes should form part of your answer.

Where considered necessary, suitable assumptions may be made and clearly indicated in the answer.

Answer to Question No. 1 in Section A *is compulsory.*

Further answer any five *from* Question No. 2 *to* Question No. 8.

SECTION – A (Compulsory)

1. Choose the correct option from the four alternatives given: 2×15=30

(i) Which one of the following is true for Blue Ocean Strategy?

(A) Beat the competition

(B) Exploit existing demand

(C) Make the competition irrelevant

(D) Make the value-cost trade off

(ii) Which of the following Quality Cost is incurred in the process of uncovering defects?

(A) Appraisal Costs

(B) Prevention Costs

(C) Internal Failure Costs

(D) External Failure Costs

(iii) BONAS Ltd. adopting a Standard Costing System provides the following information pertaining to Direct Materials for the month of April, 2024.

Standard price per unit	₹ 7·20
Actual quantity purchased in units	3200
Standard quantity allowed for actual production in units	2900
Material Price Variance on purchase (FAV)	₹ 960

What will be the actual purchase price per unit?

(A) ₹ 8·50

(B) ₹ 7·80

(C) ₹ 6·90

(D) ₹ 6·50

(iv) The Break Even Sales of GXT Ltd., a manufacturing company, is ₹ 3,75,000, while its fixed cost is ₹ 1,12,500. If the Margin of Safety is 40%, what will be its Profit?

(A) ₹ 80,000

(B) ₹ 75,000

(C) ₹ 64,000

(D) Insufficient information

(v) The Pay-off Matrix of a game is given below:

$$\begin{array}{c} \\ \textit{Player A} \end{array} \begin{array}{c} \textit{Player B} \\ \begin{pmatrix} 3 & -1 & 4 \\ -1 & 8 & 2 \\ 16 & 8 & 6 \end{pmatrix} \end{array}$$

What is the value of Game to Player A(using Maximin–Minimax Principle)?

(A) 6

(B) 8

(C) 16

(D) None of the above

(vi) BENT Ltd., a manufacturer of components for VCD, has a capacity to produce 4 Lakh units. The market demand is sensitive to the sale price and the company could sell 1 Lakh units at a price of ₹ 5,000 each. The demand thereafter would double for each ₹ 500 per unit fall in the selling price. If the company expects a minimum margin of 25%, what would be the Target Cost per unit for the company to sell at full capacity utilization?

(A) ₹ 4,000

(B) ₹ 3,200

(C) ₹ 3,000

(D) ₹ 2,900

(vii) DOXT Ltd., a manufacturing company, is preparing a quotation for a new product-D. The time taken for the first unit is 30 hours. The company expects 85% learning curve (Index is – 0·2345). The company desires that the quotation should be based on the time taken for the final output within the Learning period which is expected to end after the company has produced 200 units. What will be the time per unit of product to be used for the quotation?

[Given: $199^{-0.2345} = 0{\cdot}28901$, $200^{-0.2345} = 0{\cdot}28867$ and $201^{-0.2345} = 0{\cdot}28834$]

(A) 6·63 hours

(B) 10·34 hours

(C) 11·50 hours

(D) None of the above

(viii) Production overheads of XYZ Ltd. for 500 units of product X are:

Machine oriented activity cost: ₹ 1,35,400

Material ordering overheads: ₹ 69,570

Machine hours are 1·50 hours per unit and No. of material orders are 6 per unit.

What is the Machine Oriented Cost per unit and Material Ordering Cost per unit respectively?

(A) ₹ 270·80 & ₹ 139·14

(B) ₹ 180·53 & ₹ 23·19

(C) ₹ 23·19 & ₹ 180·53

(D) ₹ 139·14 & ₹ 270·80

(ix) Which of the following is/are not the features of Jedox tool?

(A) Deployable in the cloud as well as on premise server or Hybrid.

(B) BI and Analytics platform.

(C) Allows users to easily create and share powerful reports within minutes.

(D) (B) and (C) only

(x) Analysis of a dataset has revealed the fact that profit of a business has reduced for the financial year 2022-23. What category of data analytics it comes under?

(A) Descriptive Analytics

(B) Predictive Analytics

(C) Diagnostic Analytics

(D) Prescriptive Analytics

(xi) A particular job MB requires 800 kgs. of a material. 500 kgs. of the particular material is currently in stock. The original price of the material was ₹ 300 but current resale value of the same has been determined as ₹ 200. The current replacement price of the material is Re. 0·80 per kg., what will be the relevant cost of material for job MB?

(A) ₹ 640

(B) ₹ 440

(C) ₹ 300

(D) None of the above

(xii) Total Revenue of ZOM Ltd., from the Sales of the quantity (units) is given by the equation $R = \frac{1}{3}\chi 3 - \chi 2 + 10\chi + 5$. If the Marginal revenue is 25, what will be number of quantity (in units)?

(A) 6

(B) 4

(C) 5

(D) None of the above

(xiii) When a maximisation assignment problem is converted to minimisation problem, the resultant matrix is called:

(A) Profit Matrix.

(B) Regret Matrix.

(C) Cost Matrix.

(D) Dummy Matrix.

(xiv) The important step(s) required for simulation approach in solving a problem is/are:

(A) Test and validate the Model

(B) Design the experiment

(C) Conduct the experiment

(D) All of the above

(xv) The expected time for an activity of Project LM is 20 days. If the most likely and pessimistic time are 19 days and 28 days, what will be the variance of the activity?

(A) 1·36
(B) 1·78
(C) 4
(D) 0

SECTION – B

Answer any Five Questions. Each question carries 14 Marks. **14×5=70**

2. ZOYAN Limited is currently manufacturing 5000 units of the product 'ZN 100' annually making full use of its machine capacity. The selling price and total costs per unit associated with 'ZN 100' are as follows:

	₹	₹
Selling price per unit		900
Costs per unit :		
Direct material	200	
Variable machine operating cost	150	
(₹ 100 per machine hour)		
Manufacturing overhead cost	180	
Marketing and administrative cost	200	730
Operating income per unit of 'ZN 100'		170

ZOYAN Limited can sell additional 3000 units of 'ZN 100', if it can outsource those additional units.

AOB Limited, a supplier of quality products, has agreed to supply up to 6000 units of 'ZN 100' per year at a price of ₹ 650 per unit delivered at ZOYAN's factory.

ZOYAN Limited can use its facility to produce an alternative product 'ZN 200'. It can sell up to 12000 units of 'ZN 200' annually. Estimated selling price and total costs per unit to manufacture and sell 12000 units of 'ZN 200' are as follows:

	₹	₹
Selling price per unit		600
Costs per unit :		
Direct material	200	
Variable machine operating cost	50	
(₹ 100 per machine hour)		
Manufacturing overhead cost	60	
Marketing and administrative cost	110	420
Operating income per unit of 'ZN 200'		180

Other information pertaining to the operation of Zoyan Limited is as follows:

(i) ZOYAN Ltd., use machine hours as the basis for assigning fixed manufacturing overhead. The fixed manufacturing overhead for the current year is ₹ 3,00,000. These costs will not be affected by the product-mix decision.

(ii) Variable marketing and administrative cost per unit for various products are as follows:

Manufactured	'ZN 100'	₹ 80
Purchased	'ZN 100'	₹ 40
Manufactured	'ZN 200'	₹ 60

Fixed marketing and administrative costs for the current year is ₹ 6,00,000. These costs will be affected by the product mix decision.

Required :

(a) Analyse the Contribution per unit between manufactured 'ZN 100' and manufactured 'ZN 200'.

(b) Analyse the Contribution per unit between manufactured 'ZN 100' and purchased 'ZN 100'.

(c) Calculate the quantity of each product that ZOYAN Limited should manufacture and/or purchase to maximize operating income. 14

3. (a) MN Co. has profit centre divisions EXE and WYE making products X and Y respectively. Each unit of Y requires one unit of X and WYE can sell a maximum of 100000 units in the external market at a selling price of ₹ 200 per unit. EXE has the capacity to produce 200000 units of X. The variable cost per unit is ₹ 15. Fixed costs are ₹ 15, 00,000. EXE can sell the following quantities in the external market:

Price per unit	Demand units
₹ 25	160000 units
₹ 30	175000 units
₹ 35	150000 units
₹ 40	125000 units
₹ 45	100000 or less

WYE can purchase its requirement from the external market at ₹ 35 per unit.

Required:

(i) Assess what will be the best strategy for EXE, if no demand from WYE.

(ii) Calculate the minimum transfer price that EXE will agree if EXE has to supply 100000 units to WYE.

(iii) If WYE agrees to accept the partial supplies, assess and recommend what will be the EXE's best strategy under no compulsion to transfer the maximum units? Calculate the quantity that EXE will agree to transfer and the corresponding price, assuming both divisions agree to share the benefits of transfer equally. 7

(b) POSIN Limited supports the concept of the life cycle costing for new investment decisions covering its engineering activities.

The Company is to replace a number of its machines and the Production Manager is to decide between the 'BX' machine, a more expensive machine with a life of 12 years, and the 'SW' machine with an estimated life of 6 years. If the 'SW' machine is chosen it is likely that it would be replaced at the end of 6 years by another 'SW' machine. The pattern of maintenance and running cost differs between two types of machine and relevant data are shown below :

Machine	BX (₹)	SW (₹)
Purchase Price	38,00,000	26,00,000
Trade-in-value	6,00,000	6,00,000
Annual Repair Cost	4,00,000	5,20,000
Overhaul Cost (p.a.)	8,00,000 (at year 8)	4,00,000 (at year 4)
Estimated financing costs averaged over machine life (p.a.)	10%	10%

Given :

Years	3	4	5	6	7	8	10	12
PVIF (10%)	0·75	0·68	0·62	0·56	0·51	0·47	0·38	0·32

PVIF(10%, 6) = 4·36, PVIFA (10%, 12) = 6·81

Required:

Analyze and Recommend which machine should be purchased. 7

4. (a) BIVON Ltd., a manufacturing company, manufactures 3 products VN, DN and XN. Due to scarcity of machine hours, management of BIVON Ltd., is planning to adopt Throughput Accounting in the company. The informations pertaining to the three products are as follows:

	VN	DN	XN
Selling price per unit	₹ 5,000	₹ 4,000	₹ 3,500
Material Cost per unit	₹ 2,500	₹ 2,500	₹ 2,000
Machine Hours required	5	6	4
Maximum annual demand	3000 units	4000 units	2000 units

Total factory cost is ₹ 1,05,00,000 and available machine hours are 35000 hours.

BIVON Ltd. has to supply 2500 units of product DN to Beta Ltd. as per a court judgement which cannot be denied.

Required:

(i) Rank the products using Throughput Accounting and prepare a statement showing Optimal Mix for maximization of profit.

(ii) Whether court Judgement has affected the Optimum Plan of profit of the company, if yes, by which amount? 7

(b) What is Lean Accounting? Append the Principles and Practices of Lean Accounting. 7

5. (a) Eighteen workers (12 Type I workers and 6 Type II workers) work in a production process of RONT Ltd. during a month of 25 working days. Each Type I worker is expected to produce 8 units per day and Type II worker is expected to produce 10 units per day. They work on the regular shift from 9:00 a.m. to 5:00 p.m. and have a tea break between 10:30 to 10:45 a.m. and 3:00 to 3:15 p.m. and also have a lunch break from 1:00 to 1:30 p.m. The actual production was 2000 units by Type I workers and 1200 units by Type II workers. The standard wage rate per hour were ₹ 80 and ₹ 90 for Type I and Type II workers respectively and corresponding actuals were ₹ 90 and ₹ 100 respectively. During the month, 16 hours were lost actually for both types of workers, which is also as per expectation for waiting for materials and inspection.

Note: Normal waiting and breaks time are included in standard hours for production.

Required:

Analyse and calculate the following:

(i) Standard Labour Cost for the month

(ii) Labour Cost Variance

(iii) Labour Efficiency Variance

(iv) Idle Time Variance 7

(b) ZOSIN Ltd., a manufacturing company using the budgetary control and standard costing system, has furnished the following information:

Standard overhead absorption rate per unit	₹ 20
Standard rate per hour	₹ 4
Budgeted production	12000 units
Actual production	15560 units
Actual working hours	74000

Actual overheads amounted to ₹ 2,95,000 out of which ₹ 62,500 are fixed.

Overheads are based on the following flexible budget:

Production (units)	Total overheads (₹)
8000	1,80,000
10000	2,10,000
14000	2,70,000

Required:

Analyse and calculate the following overheads variances on the basis of hours :

(i) Variable Overhead Efficiency variance

(ii) Variable Overhead Expenditure variance

(iii) Fixed Overhead Efficiency variance

(iv) Fixed Overhead Capacity variance 7

6. (a) FAMC Ltd., a manufacturing company produces three products A, B and C. It uses two types of raw materials I and II of which 5000 and 7500 units respectively are available. The raw material requirements per unit of the products are given below:

Raw Material	Requirement per unit of Product		
	A	B	C
I	3	4	5
II	5	3	5

The labour time for each unit of product A is twice that of product B and three times that of product C. The entire labour force of the firm can produce the equivalent of 3,000 units. The minimum demand of the three products is 600, 650 and 500 units respectively. Also the ratios of the number of units produced must be equal to 2 : 3 : 4. The profits per unit of A, B and C are ₹ 50, ₹ 50 and ₹ 80 respectively.

Required:

Analyze and Formulate the problem as a linear programming model in order to determine the number of units of each product which will maximize the profit. 7

(b) MOSAN Ltd., an International tourist company deals with numerous personal callers each day and prides itself on its level of service. The time to deal with each caller depends on the client's requirements which range from, say a request for a brochure to booking a round-the-world-cruise. If a client has to wait for more than 10 minutes for attention, it is company's policy for the manager to see him personally and to give him a holiday voucher worth ₹ 15.

The company's observations have shown that the time taken to deal with clients and the arrival pattern of their calls follow the following distribution pattern:

Time to deal with clients	Minutes	2	4	6	10	14	20	30
	Probability	0·05	0·10	0·15	0·30	0·25	0·10	0·05
Time between call arrivals	Minutes	1	8	15	25			
	Probability	0·2	0·4	0·3	0·1			

Required :

(i) Demonstrate how you would simulate the operation of the travel agency based on the use of random number tables.

(ii) Simulate the arrival and serving of 12 clients and show the number of clients who receive a voucher (use Line 1 of the random numbers below to derive the arrival pattern and Line 2 for serving times)

Note: for using Random Number.

Line 1	3	47	43	73	86	36	96	47	36	61	46	98
Line 2	63	71	62	33	26	16	80	45	60	11	14	10

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7. JOBSON Ltd., a manufacturer of plant and machinery is in the process of quoting a tender called by ZOYB Ltd. Delivery date once promised is crucial and penalty clause is applicable. The Project Manager of JOBSON Ltd. has listed down the activities of the project as under:

ACTIVITY (i – j)	**Estimated Duration (in Weeks)**		
	Optimistic (a)	**Most likely (m)**	**Pessimistic (b)**
1 – 2	1	1	7
1 – 3	1	4	7
1 – 4	2	2	8
2 – 5	1	1	1
3 – 5	2	5	14
4 – 6	2	5	8
5 – 6	3	6	15

Required:

(i) Design the project network and indicate all the paths through it.

(ii) Analyse the expected duration and variances for each activity and Assess project length.

(iii) Calculate the standard deviation of the project length and critically assess the probability that the project will be completed:

(a) At least 3 weeks earlier than expected time.

(b) No more than 3 weeks later than expected time.

(iv) If the project due date is 18 weeks, assess the probability of not meeting the due date.

Given: Table for areas under normal curve for O to Z.

Z = O to Z	0.10	0.33	0.67	1.00	1.33	2.00
Table Value	0.0398	0.1293	0.2486	0.3413	0.4082	0.4772

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8. (a) ZUZOO Ltd., a Mobile manufacturer produces χ sets per week at total cost of $\chi^2 + 78\chi + 300$. ZUZOO Ltd. is a monopolist and demand function for the product is $\chi = (600 - P)/8$ when price in rupees is P per set.

Required:

(i) Analyze the Optimal (Profit maximizing) production per week.

(ii) Assess the monopoly price per week.

(iii) Assess the Total Cost and Profit at the optimal production. 7

(b) From the following data fit a Straight Line trend by the Method of Least Squares and assess the export turnover in the year 2025.

Year	2015	2016	2017	2018	2019	2020	2021
Exports(Figures in crores)	20	22	25	27	26	30	32

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