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TEST PAPER – 02

(Chapter Covered –Decision Making Techniques)

STRATEGIC COST MANAGEMENT

Time Allowed: 3 Hours

Full Marks: 100

Section A contains Question Number 1. All parts of this question are compulsory.
Working notes should form part of the relevant answer.

SECTION-A

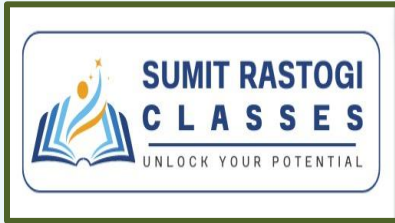
1. Choose the correct answer from the given alternatives (you may write only the Roman number and the alphabet chosen for your answer) (2×15 = 30 Marks)

- (i) The Income statement of BOMA Ltd. is summarized as below:

	(₹ in Lakh)
Net Revenue	120
Less: Expenses (including ₹60 lakh of fixed cost)	132
Net Loss	12

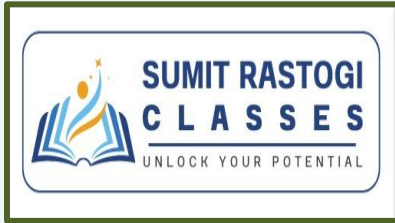
The Manager (F&A) believes that an increase of ₹30 lakh as fixed expenditure in advertising outlays will increase the sales substantially. At what sales volume will the company have break-even?

- (a) ₹250 Lakh
(b) ₹225 Lakh
(c) ₹200 Lakh
(d) None of the above
- (ii) MN Ltd. sales for the years 2018 and 2019 were 8,00,000 and 7,92,000. The cost of goods sold correspondingly were 4,80,000 and 4,64,000. In the year 2019 selling price was reduced by 10% as compared to 2018. What was the decrease in gross profit caused by the change in selling price?
- (a) ₹8,000
(b) ₹72,000
(c) ₹79,200
(d) ₹88,000



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- (iii) X Ltd. has annual turnover of ₹200 lakhs and an average C/S ratio of 40%. It makes 10% profit on sales before charging depreciation and interest which amount to ₹10 lakhs and ₹15 lakhs respectively. The fixed cost of X Ltd. will be:
- (a) ₹70 Lakhs
 - (b) ₹85 Lakhs
 - (c) ₹90 Lakhs
 - (d) ₹60 Lakhs
- (iv) ASH Ltd., a manufacturing company produced 300 units of product-HB and sold 240 units @₹600 per unit during the year. The following information pertains to production and sale for the year:
- | | |
|------------------------------------|---------|
| Variable cost per unit | ₹330 |
| Fixed Costs for the year: | |
| Manufacturing Overheads | ₹21,000 |
| Selling & Administration Overheads | ₹30,000 |
- There was no beginning inventory.
What will be the income under absorption costing for the year?
- (a) ₹24,000
 - (b) ₹18,000
 - (c) ₹15,000
 - (d) None of the above
- (v) The profit volume ratio of Divon Ltd. is 30%, while the margin of safety is 40%. If fixed cost of the company is ₹1,80,000, what will be its profit (net)?
- (a) ₹1,20,000
 - (b) ₹1,50,000
 - (c) ₹1,60,000
 - (d) None of the above
- (vi) WYE Ltd. is using the target cost approach. The following data has been collected:
- Expected sales revenues: ₹75,00,000 (₹15 per unit)
Projected selling and distribution cost: ₹3,00,000
Projected Variable Cost per unit: ₹10
Desired Profit: ₹9,50,000
- What will be the target Cost per unit?
- (a) ₹14.40
 - (b) ₹13.10
 - (c) ₹12.50
 - (d) None of the above



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- (vii) P Ltd. has old inventory on hand that cost ₹12,000. Its scrap value is ₹16,000. The inventory could be sold for ₹40,000 if manufactured further at an additional cost of ₹12,000. What should P Ltd. do?

(a) ₹16,000
(b) ₹40,000
(c) ₹28,000
(d) ₹24,000

- (viii) H Group has two divisions, Division P and Division Q. Division P manufactures an item that is transferred to Division Q. The item has no external market and 6,000 units produced are transferred internally each year. The costs of each division are as follows?

	Division P	Division Q
Variable Cost	₹100 per unit	₹120 per unit
Fixed Cost each year	₹1,20,000	₹90,000

Head Office management decided that a transfer price should be set that provides a profit of ₹30,000 to Division P. What should be the transfer price per unit?

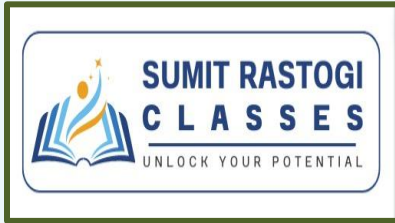
(a) ₹145
(b) ₹125
(c) ₹120
(d) ₹135

- (ix) A production of ZON Ltd. has the capacity to produce either 4,000 units of A, or 3,500 units of B or 5,000 units of C. Only one product can be made in a production period. The contributions per unit of A, B and C are ₹10, ₹11 and ₹8 respectively. The opportunity cost of A would be:

(a) ₹44,000
(b) ₹38,500
(c) ₹50,000
(d) ₹40,000

- (x) 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 ₹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



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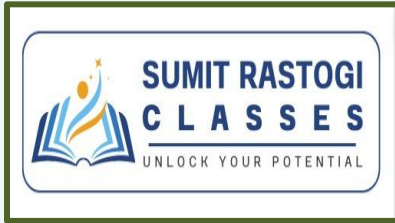
- (xi) _____ is the difference between the sales price needed to capture a predetermined market share and the desired profit per unit.
- (a) Gross Profit
 - (b) Target Cost
 - (c) Target Price
 - (d) None of these
- (xii) Target Costing is the answer to:
- (a) Market Driven Prices
 - (b) Seller's Market
 - (c) No Profit Situation
 - (d) None of the above
- (xiii) 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 are expected to be sold in the coming year. If the value of investments of the company is ₹15 lakhs and it has a target ROI of 15%, the target cost would be:
- (a) ₹930
 - (b) ₹950
 - (c) ₹1,050
 - (d) ₹1,130
- (xiv) During which phase of the Product Life Cycle, sales rise at an increasing rate?
- (a) Introduction
 - (b) Growth
 - (c) Maturity
 - (d) Decline

- (xv) RIM Ltd. has estimated the demand level of its product:

Sales (units)	5,000	10,000	15,000	20,000
Probability	0.10	0.20	0.40	0.30

It has estimated contribution of ₹4 per unit and total fixed costs of ₹60,000. What is the probability that the company will make a profit of at least ₹15,000?

- (a) 40%
- (b) 30%
- (c) 20%
- (d) None of the above



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SECTION-B

2. RONTEx Ltd. (Builders) has been offered a contract by Exyan Ltd. to build for it five special Guest Houses for use by top management. Each guest house will be an independent one. The contract will be for a period of one year and the offer price is ₹1 crore. In addition, Exyan Ltd. will also provide 2 grounds of land free of cost for the purpose of construction. The Chief Accountant of Rontex Ltd. has prepared an estimate on the basis of which he has advised that the contract should not be accepted at the price offered. His estimate was as follows:

	₹ in Lakh
Land (3 Grounds at ₹20 lakh each)	60
Drawing and Design	7
Registration	10
Materials:	
Cement and Sand	6
Bricks and Tiles	4
Steel	10
Others (Including interior decoration)	10
Labour - Skilled	12
- Unskilled	8
Supervisor's Salary	5
Overheads General	12
Depreciation	6
Total Cost	150

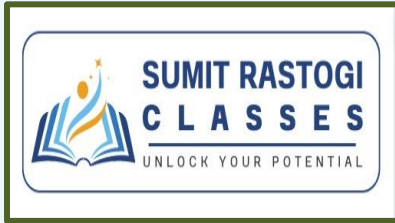
The Accountant also provides the following information:

Land: The total requirement of land is 3 grounds costing ₹20 lacs per ground, Exyan Ltd. will provide 2 grounds free of cost.

Drawing and Design: These have already been prepared and 50% of the cost has already been incurred.

Materials:

- (i) Cement and Sand are already in stock and are in regular use, if used for this contract, they have to be replaced at a cost of ₹8 lakh.
- (ii) Bricks and Tiles represent purchases made several months before for a different contract. They could be sold readily for a net ₹5 lakh after meeting all further expensed.
- (iii) Others: Materials worth ₹2 lakh relating to interior decoration are in stock for which no alternative use is expected in the near future. However, they can be sold for ₹1 lakh.



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Labour:

- (i) Skilled workers will be transferred to this project from another project. The project manager claimed that if the men were returned to him, he could have earned the company an additional ₹2 lakh in terms of profits.
- (ii) The supervisor undertakes various tasks in the sites and his pay and continuity of employment will not be affected by the new contract. If the contract is taken, he will devote half of his time.

Overheads:

- (i) The equipment that would be used on the contract was bought one year before for ₹30 lakh and is expected to last for five years. It can also be used on other contracts and the current replacement price will be ₹32 lakh and in a year's time it will be ₹25 lakh.
- (ii) The general Z overheads include both specific and absorbed overheads. If the contract is not undertaken, ₹4 lakh of the same can be avoided.

RONTEX Ltd. has also on hand another project, which would not be executed if the contract from Exyan Ltd. were to be accepted. The estimated profit on that project is ₹10 lakhs.

Required:

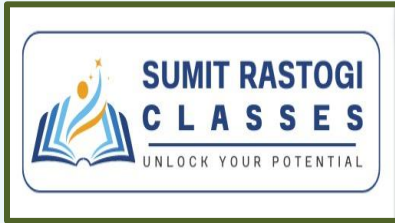
- (a) Draw inference from the information given supra and identify the following.
 - (i) Relevant cost if the contract is accepted
 - (ii) Irrelevant cost if the contract is accepted
- (b) Indicate with reasons as a cost and management accountant of the company whether it should accept the contract from Exyan Ltd. or not. **(14 Marks)**

3. (a) Division A of DOXIN Ltd. has been given a budgeted target of selling 2,00,000 components TOM 22 it manufactures at a price which would fetch a return of 25% on the average assets employed by it. The following figures are relevant:

Fixed Overhead	₹4,00,000
Variable Overhead	1 per unit
Assets:	
Sundry Debtors	2,00,000
Stocks	6,00,000
Plant and other assets	4,00,000

However, the marketing department of the company finds out by a survey that the maximum number of TOM 22, the market can take, at the proposed price is only 1,40,000 units.

Fortunately, Division B is willing to purchase the balance 60,000 units. The Manager, Division A, is willing to sell to Division B at a concessional price of ₹4 per unit. But the Manager, Division B, is ready to pay ₹2.25 only per unit, as he feels he can himself make TOM 22 in his Division at that price.



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Rather than sell to Division B at ₹2.25, the Manager, Division A, feels he will restrict the activity of his Division to the manufacture and sale of ₹1,40,000 components only. By this, he could reduce ₹80,000 in stocks, ₹1,20,000 of plant and other assets and ₹40,000 in selling and administration expenses (fixed in nature).

Required:

As a cost and management accountant, you are:

- (i) Asked to make comparative study of proposals of Divisional Manager and
- (ii) Justify that selling 60,000 TOM 22 to Division B at ₹2.25 per unit would be in the interest of the organization. **(7 marks)**

3. (b) SRM Ltd. manufactures and sells a single product X whose selling price is ₹80 per unit and the variable cost is ₹32 per unit.

- (i) Assume that for first year fixed costs are ₹9,60,000 and the annual sales are at 60% margin of safety.
- (ii) For second year, it is proposed to add another product line Y whose selling price would be ₹100 per unit and the variable cost ₹20 per unit. The total fixed costs are estimated at ₹13,33,200. The sales mix of X:Y would be 7:3 based on value.

Required:

- (I) For the first year, calculate the rate of net return on sales, assuming an income tax level of 30%.
- (II) For second year, at what level of sales would SRM Ltd. break-even? Give separately for both X and Y the break-even sales in rupees and quantities. **(7 marks)**

4. (a) You have been approached by a friend who is seeking your advice as to whether he should give up his job as an engineer, with a current salary of 14,800 per month and go into business on his own, assembling and selling a component which he has invented. He can procure the parts required to manufacture the component from a supplier.

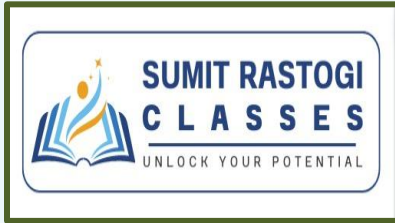
It is very difficult to forecast the sales potential of the component, but after some research, your friend has estimated the sales as follows:

- (i) Between 600 to 900 components per month at a selling price of ₹250 per component.
- (ii) Between 901 to 1,250 components per month at a selling price of ₹220 per component for the entire lot.

The costs of the parts required would be ₹140 for each completed component. However, if more than 1,000 components are produced in each month, a discount of 5% would be received from the supplier of parts on all purchases.

Assembly costs would be ₹60,000 per month upto 750 components. Beyond this level of activity assembly costs would increase to ₹70,000 per month.

Your friend has already spent ₹30,000 on development, which he would write off over the first five years of the venture.



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Required:

- (i) Analyse the information stated supra and formulate by way of calculating for each of the possible sales levels at which your friend could expect to benefit by going into the venture on his own.
- (ii) Formulate by way of calculating the break-even point of the venture for each of the selling price and suggest your friend on each level of break-even point.
- (iii) Advise your friend as to the viability of the venture **(7 marks)**

4. (b) AGROCAM Ltd. in manufacturing agricultural machinery is preparing its annual budget for the year 2023-24. The company has a metal pressing capacity of 20,000 hours, which will be insufficient for manufacture of all requirements of components A, B, C and D. The company has the following choices:

- (i) Buy the components entirely from outside suppliers.
- (ii) Buy from outside suppliers and/or use a partial second shift.

The data for the year 2022-23 are given below:

Standard productions cost per unit

	A (₹)	B (₹)	C (₹)	D (₹)
Variable Cost:				
Direct Materials	37	27	25	44
Direct Wages	10	8	22	40
Direct Expenses	10	20	10	60
Fixed Overhead	5	4	11	20
Total Product cost p.u.	62	59	68	164
Requirements in units	2,000	3,500	1,500	2,800

Direct expenses relate the use of the metal presses which cost ₹10 per hour to operate.

Fixed Overheads are absorbed as a percentage of direct wages.

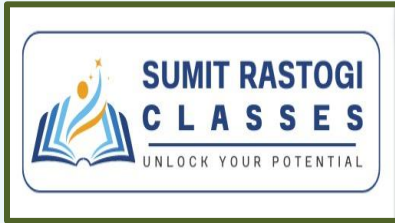
Supply of all or any part of the total requirement can be obtained at following prices, each delivered to the factory:

Component	₹
A	60
B	59
C	52
D	168

Second shift operations would increase direct wages by 25 percent over the normal shift and fixed overhead by ₹500 for each 1,000 (or part thereof) second shift hours worked.

You are required to present the following:

- (i) Which component, and in how much quantities should it be manufactured in the 20,000 hours of press time available?
- (ii) Whether it would be profitable to make any of the balance of components required on a second shift basis instead of buying them from outside suppliers. **(7 marks)**



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5. GREEN SINE (C) Ltd. a cement manufacturing company, produces '50 grade' cement for which the company has an assured market. The output for 2024 has been budgeted at 1,80,000 units at 90% capacity utilization. The cost sheet based on output (per unit) is as follows:

	(₹)
Selling Price	130
Direct Material	30
Component "EX"	9.40
Direct Wages @₹7 per hour	28
Factory Overheads (50% Fixed)	24
Selling and distribution Overheads (75% variable)	16
Administrative Overheads (Fixed)	5

The factory overheads are applied on the basis of direct labour hours.

To utilize the idle capacity and to improve the profitability of the company, the following proposal was put up before the Board of Directors for consideration:

An order has been received from abroad for 6,000 units of product '53 grade' cement at ₹175 per unit.

The cost data are:

Direct material ₹56 per unit, direct labour 10 hours per unit, selling and distribution overheads applicable to this product order is ₹14 per unit and variable factory overheads are chargeable on the basis of direct labour hours.

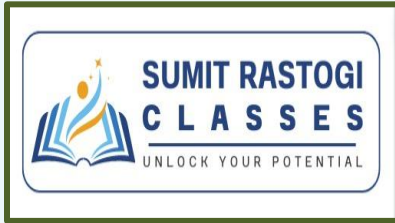
The company at present manufactures component 'EX' one unit of which is required for each unit of product '50 grade' cement. The cost details for 15,000 units of component 'EX' are as follows:

	(₹)
Direct Material	30,000
Direct Labour	52,500
Variable Overheads	25,500
Fixed Overheads	33,000
Total	1,41,000

The component "EX" however is available for purchase at the market at 7.90 per unit.

Required:

- Prepare a statement showing profitability of the company as envisaged in the Budget.
- Evaluate the export order and state whether it is acceptable or not.
- Make an appraisal of proposal to manufacture component "EX" and state whether component "EX" should be manufactured in the factory or purchased from the market. Assume that no alternative use of spare capacity is available. **(14 marks)**



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6. (a) Krishna Rice Stores have been approached by the authorities of a local Temple for the supply of different grades of rice for the Annual Temple Festival. The festival will be celebrated for ten days. It is expected that on an average One thousand people will be fed per day. The Temple requires 30 bags of rice with each bag containing 100 kgs. Each bag would consist of the following: Grade A 50 kgs, Grade B 30 kgs and Grade C 20 kgs. The Stores employs 5 labourers in its shop and each of them works for 8 hours a day and 25 days in a month. For this order they worked for five days. The general fixed cost per month is ₹50,000. The Stores normally sells the rice at a profit of 20% on the selling price. **The stores provide the following information:**

Grades of Rice	Stock on Hand Quantity Kgs.	Actual Purchase Price/kg ₹	Current Market Price/Kg ₹
Grade A	1,000	80	100
Grade B	500	70	80
Grade C	600	50	60
Grade D	500	50	24

Grades A, B & C are regularly used by the stores in the normal course of business. The stock of Grade D represents purchases of another order which was cancelled. They can be substituted for Grade C without any objection from the Temple. Otherwise with no alternative use they can be sold in the market for ₹12,000. Variable overheads are 50% of labour. The current cost of this labour is hour ₹200 per hour.

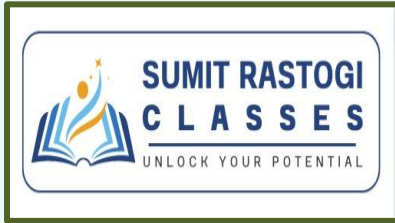
Compute the Minimum price per bag assuming the special order is a Onetime order.
(7 marks)

6. (b) KAPN Ltd., has two manufacturing divisions. Each division operates as an Independent profit centre. Division A is the only source of a component that is used in Division B in manufacturing of a final product UBEKA. For each unit of UBEKA, one component manufactured by Division A is used. Demand for UBEKA is not steady. Division B can increase sell of UBEKA by spending on sales promotion and/or by reducing selling price.

The Manager of Division B has prepared the following forecast:

Sales in units per day	Average selling price per unit of UBEKA (₹)
1,000	52.50
2,000	39.80
3,000	33.00
4,000	27.80
5,000	24.00
6,000	20.10

The manufacturing cost of UBEKA in Division B is ₹37,500 on first 1,000 units and additional ₹7.50 per unit for every additional 1,000 units manufactured. Division A incurs a total cost of ₹15,000 per day, for an output of 1,000 components and the total costs will increase by ₹9,000 per day for every additional 1,000 components manufactured.



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Manager of Division A states that operating results of his Division will be optimized if the transfer price is set at ₹12 per component and accordingly, he has set the above transfer price.

Required:

- (i) Analyze the profitability at each level of Division A and Division B.
- (ii) Assess the profitability of company as a whole at the output level
 - (a) when the net profit of Division A is maximum.
 - (b) when the net profit of Division B is maximum.
- (iii) If the company is not organized on profit centre basis what level of output will be chosen to yield maximum profit? **(7 marks)**

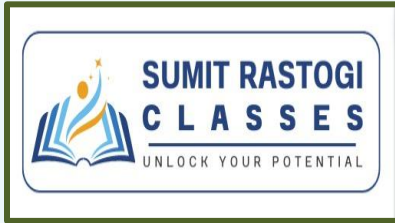
7. (a) ASLIN Company has the capacity of production of 80,000 units and presently sells 20,000 units at ₹100 each. Demand is sensitive to selling price and it has been observed that for every reduction of ₹10 in selling price, the demand is doubled.

Required:

- (i) Calculate the Target Cost at full capacity, if profit margin on sale is 25%
- (ii) Assess the Cost Reduction Scheme at full capacity if at the present level 40% of the cost is variable and total fixed cost is 36 lakhs.
- (iii) If Rate of Return desired is 16%, evaluate the maximum investment at full capacity. **(7 marks)**

7. (b) 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
Manufacturing	
Variable cost per battery	₹25
Variable cost per batch	₹300
Battery per batch	250
Fixed costs	₹12,00,000
Marketing	
Variable cost per battery	₹3.50
Fixed costs	₹8,00,000
Distribution:	
Variable cost per battery	₹140
Battery per batch	100
Fixed costs	₹4,60,000
Customer service cost per battery (Variable)	₹1.70



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Ignore the time value of money.

Required:

- (i) Calculate the budgeted life cycle operating income for the new battery.
- (ii) What percentage of the budget total product life cycle costs will be incurred by the end of the R&D and design stages?
- (iii) 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. **(7 marks)**

- 8. (a)** SOVAN Ltd., a manufacturing company is preparing budget for 2025. The parameters relating to sales, price and cost are as follows:

Sales Price	200 per unit
Variable Cost	120 per unit
Fixed Costs	2,20,00,000 per year

Sales forecast have been prepared which disclose the following:

Quantity	Probability	Quantity	Probability
15,000	0.10	35,000	0.30
20,000	0.10	40,000	0.10
25,000	0.10	45,000	0.10
30,000	0.20	-	-

Required:

- (i) Analyze the break-even quantity.
- (ii) Analyze how many units must be sold to (a) earn a profit of ₹6,00,000 (b) incur a loss of ₹5,00,000.
- (iii) Based on the sales forecast, identify the probability that the company can break-even.
- (iv) Analyze the probability of achieving sales volumes involved in part (ii). **(7 marks)**

- 8. (b)** For a machine the financial data are given below:

Time (Year)	0	1	2	3	4
Outlay (₹)	5,000				
Operating Costs (₹)		1,400	1,500	1,600	1,700
Maintenance (₹)			300	400	500
Value if scrapped (₹)		3,400	2,000	800	600

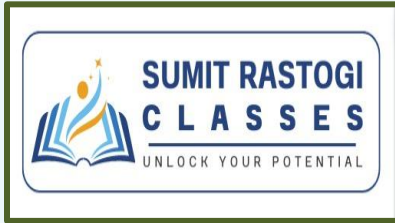
The appropriate interest rate is 12% p.a. and the discount factor is as follows:

Year	0	1	2	3	4
12% Disc. Factor	1	0.893	0.797	0.712	0.636

Required:

Determine the optimal length of replacement cycle.

(7 marks)



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ANSWERS OF TEST PAPER – 02

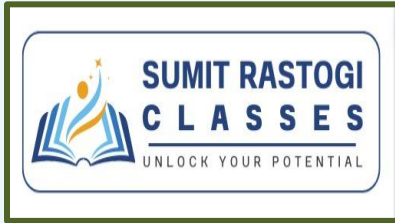
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STRATEGIC COST MANAGEMENT

SECTION-A

ANS.1

- (i) (b) ₹225 Lakh
- (ii) (d) ₹88,000
- (iii) (b) ₹85 Lakhs
- (iv) (b) ₹18,000
- (v) (a) ₹1,20,000
- (vi) (b) ₹13.10
- (vii) (c) ₹28,000
- (viii) (b) ₹125
- (ix) (d) ₹40,000
- (x) (b) ₹440
- (xi) (b) Target Cost
- (xii) (a) Market Driven Prices
- (xiii) (c) ₹1,050
- (xiv) (b) Growth
- (xv) (b) 30%



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SECTION-B

ANS. 2

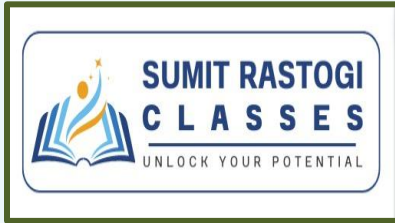
(a) (i) Statement of Relevant Costs:

Cost Item	Amount (₹ in Lakhs)	Relevance Explanation
Land: 1 Ground	20	Rontex Ltd. is required to pay for one ground
Registration	10	Specially required to be incurred for the Project
Cement and Sand	8	Replacement cost is relevant as it is regularly used
Bricks and Tiles	5	Sale value is relevant as it is not used regularly
Steel	10	Specially required to be incurred for the Project
Interior Decoration	1	Sale value is relevant as it has no alternative use
Others (10 – 2)	8	Specially required to be incurred for the Project
Skilled Labour	2	Loss of Profit due to diversion of Skilled labour to this project
Unskilled	8	Specially required to be incurred for the Project
Overheads	4	If contract not undertaken, they are avoidable
Equipment (32 – 25)	7	Difference between replacement price is relevant
Loss of Contribution from other project	10	Other project cannot be taken if project from Exyan Ltd. is taken
Total Costs	93	

(ii) Statement of Irrelevant Costs:

Cost Item	Amount (₹ in Lakhs)	Relevance Explanation
Drawings & Design	7	Design is already completed
Supervisor's Salary	5	No impact on his pay due to this contract
Depreciation	6	Replacement Cost is relevant and not depreciation
Total Costs	18	

(b) Decision: Since the offer price of contract is ₹1 crore and its total relevant cost is ₹93 Lakh these figures clearly shows that the offer should be accepted.



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ANS. 3 (a)

Total Assets for 2,00,000 units = 2,00,000 + 6,00,000 + 4,00,000 = ₹12,00,000

Total Assets for 1,40,000 units = 2,00,000 + 5,20,000 + 2,80,000 = ₹10,00,000

Return on Assets = 12,00,000 × 25% = ₹3,00,000

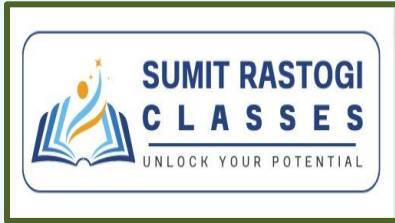
Selling Price = Fixed Cost + Variable Cost + Return on Assets

= (4,00,000/2,00,000) + 1 + (3,00,000/2,00,000) = ₹4.50

(i) Comparative profitability statement of Division A:

Particulars	Transfer at ₹4	Transfer at ₹2.25	Don't Transfer
Sales Revenue: External Sales (1,40,000 × 4.5)	6,30,000	6,30,000	6,30,000
Transfer to B: (60,000 units @ ₹4 or ₹2.25)	2,40,000	1,35,000	-
Total Revenue	8,70,000	7,65,000	6,30,000
Variable Cost @ ₹1 per unit	(2,00,000)	(2,00,000)	(1,40,000)
Contribution	6,70,000	5,65,000	4,90,000
Fixed Cost	(4,00,000)	(4,00,000)	(3,60,000)
Profit	2,70,000	1,65,000	1,30,000
Total Assets	12,00,000	12,00,000	10,00,000
Return on Assets (%)	22.50%	13.75%	13.00%

- (ii)** If the component is transferred to Division B as well as sold to outside parties, it is more profitable as the contribution and net profit are more than the existing proposal. Therefore, selling the components to Division B at D 2.25 per unit is in the overall interest of the company is justified.



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ANS. 3 (b)

- (i) Contribution per unit = SP – VC = ₹(80 – 32) = ₹48
 Break-even Point = 9,60,000/48 = 20,000 Units
 Percentage Margin of Safety = (Actual Sales – Break-even Sales)/Actual Sales Or,
 60% = (Actual Sales – 20,000 units)/Actual Sales
 Actual Sales = **50,000 units**

Particulars	₹
Sales value (50,000 units × ₹80)	40,00,000
Less: Variable Costs (50,000 units × ₹32)	(16,00,000)
Contribution	24,00,000
Less: Fixed Cost	(9,60,000)
Profit	14,40,000
Less: Income Tax @30%	4,32,000
Net Return	10,08,000

Rate of net return on sales = (10,08,000/40,00,000) × 100 = 25.2%

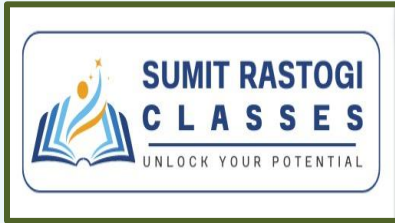
(ii)

Products	X (₹)	Y (₹)
Selling price Per unit	80	100
Less: Variable cost per unit	(32)	(20)
Contribution per unit	48	80
Individual products contribution margin	60% [(48/80) × 100]	80% [(80/100) × 100]

Contribution margin (X and Y)
 = 60% × 7/10 + 80% × 3/10 = **66%**
 Break-even sales = ₹13,33,200/66% = **₹20,20,000**

Break-even sales mix:

X – 70% of 20,20,000 = ₹14,14,000 i.e., **17,675 units**
 Y – 30% of 20,20,000 = ₹6,06,000 i.e., **6,060 units**



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ANS. 4 (a)

(i) & (ii) Break-even point & Profitability range for each of the selling Price:

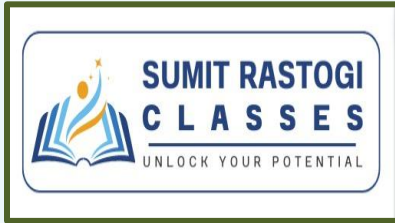
Particulars	SP ₹250	SP ₹220
Selling Price	250	220
Less: Variable Cost	(140)	(140)
Contribution per unit	110	80
Fixed Costs (Assembly)	60,000	70,000
Loss of Salary	14,800	14,800
BEP (Units) = (Fixed Costs + Salary Loss)/Contribution per unit	$74,800/110 = 680$	1,060
After 750 units assembly cost will increase so revised situation for profitability	$84,800/110 = 770.91$	-
At 1,060 units purchase price will be reduced by 5% due to discount so revised profitability situation	-	$84,800/87 = 974.71$

(iii) Advise on the viability of the venture:

- (a) At a selling price of ₹250 he will not be at a loss if the demand of the component exceeds 680 units to 749 units and 770.901 units to 900 units.
- (b) At a selling price of ₹220, BEP with discount is 974.71 units but for discount minimum Quantity is 1,000 units, so it is not worthwhile to sell if the demand is less than 1,000 components without availing a discount of 5%.

Note:

- I. The salary of ₹14,800 per month is a benefit foregone by going into business. It should therefore be considered as a minimum profit which must be earned p.m. from the new venture in order to be not worse-off than before.
- II. Sum of ₹30,000 spent on the development work of the new venture cannot be recovered irrespective of the decision and thus it should be ignored.



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ANS. 4 (b)

(i)

	A	B	C	D
Variable Cost:				
Direct Materials	37	27	25	44
Direct Wages	10	8	22	40
Direct Expenses	10	20	10	60
Cost to Manufacturing	57	55	57	144
Purchase Price	60	59	52	168
Extra Cost of Purchase (₹)	3	4	-	24
Hours Per unit (direct expenses/₹10)	1	2	1	6
Extra Cost per hour (₹)	3	2	-	4
Manufacturing Priority	2	3	4	1

Components and their quantities to be manufactured in 20,000 hours of press time available (single shift operation)

	Hours
First, Produce D ($2,800 \times 6$)	16,800
Second, Produce A ($2,000 \times 1$)	2,000
Third, Produce B (Balance Hours)	1,200
	20,000

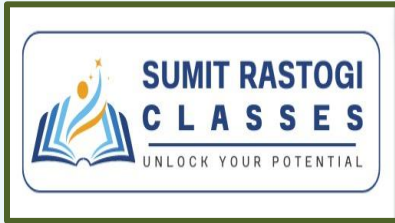
So, in 20,000 hours of press time available all the requirements of components D and A and only 600 units of component B can be manufactured. The balance requirement of component B i.e., 2,900 ($3,500 - 600$) unit will have to be bought out or manufactured in the second shift. All Requirements of Component C should be bought from outside only as it is cheaper to buy outside.

(ii) Statement of Cost of Manufacture of 2,900 units of Component B (5,800 hours) in second shift:

Particulars	₹
Direct Material ($27 \times 2,900$)	78,300
Direct Wages ($8 \times 2,900 \times 125\%$)	29,000
Direct Expenses ($20 \times 2,900$)	58,000
Increase in Fixed Cost (₹500 per 1,000 hours or part) (500×6)	3,000
	1,68,300

Cost of Buying 2,900 units of B = $2,900 \times 59 = ₹1,71,100$

Decision: Since the Cost of Manufacturing Balance quantity of Component B i.e., 2,900 in Second Shift is less by ₹2,800, it is profitable to make it on a Second Shift basis instead of buying it from outside suppliers.



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ANS. 5

Segregation of Variable Costs and Fixed Costs:

		Cost/per unit (₹)	Variable Cost (₹/Unit)	Fixed Cost (₹)
Direct Material		30.00	30.00	-
Component EX		9.40	7.20	3,96,000
Direct Wages		28.00	28.00	-
Factory Overhead	50% Fixed	24.00	12.00	21,60,000
Selling & Distribution Overhead	75% Variable	16.00	12.00	7,20,000
Administration Overhead	Fixed	5.00	0.00	9,00,000
Total		112.40	89.20	41,76,000

(i) Statement showing Profitability as envisaged in the Budget:

Units Sold	1,80,000
	Amount (₹)
Selling Price Per Unit	130.00
Less: Variable Cost per unit	(89.20)
Contribution per unit	40.80
Total Contribution	73,44,000
Less: Fixed Cost	(41,76,000)
Profit	31,68,000

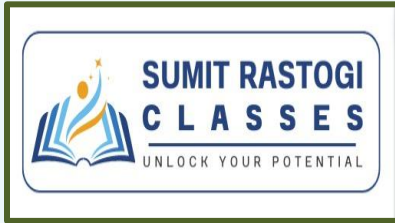
(ii) Evaluation of Export Order:

	₹ per unit	₹ per unit
Direct Material	56	
Direct Labour	70	
Variable Factory Overhead	30	
Selling and Distribution Overheads	14	
Total Variable Cost		170
Selling Price (Export)		175
Contribution		5
Total units		6,000
Additional contribution from export order (6000 units × ₹5)		₹30,000

Verification of Availability of Capacity to Fulfill the Export Order:

Total Labour Hours on Product 50 grade	7,20,000
Total Labour Hours on component EX	90,000
Total Hours utilized at 90% capacity	8,10,000
Total Hours at 100% capacity	9,00,000
Balance Hours available	90,000
Hours required for export order	60,000

Decision: Since export order gives an additional contribution of ₹30,000 and availability of capacity also exists to fulfill the export order, the same is acceptable.



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(iii) Appraisal of Make or Buy Decision:

(per 15,000 units)	Make (₹)	Buy (₹)
Direct Material	30,000	
Direct labour	52,500	
Variable factory overhead	25,500	
Total	1,08,000	1,18,500
Per unit	7.20	7.90

Decision: If the company makes the component, the out-of-pocket cost is ₹7.20 per unit whereas if the component is bought, the out-of-pocket cost is ₹7.90. since no alternative use of spare capacity is available, it is profitable to make.

ANS. 6 (a)

Statement of Relevant Cost for special order:

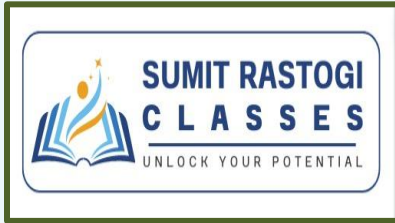
Particulars	Amount (₹)
Grade A Rice (50 × 100 × 30) (current market price is relevant)	1,50,000
Grade B Rice (30 × 80 × 30) (current market price is relevant)	72,000
Grade C Rice: (20 × 30 = 600 kg)	
500 kg of Grade D can be used (Resale Price is relevant)	12,000
100 kg of Grade C will be used (100 × 60) (current market price is relevant)	6,000
Labour Cost (5 × 8 × 5 days) × 200/hour	40,000
VOH (50% × 40,000)	20,000
Total Cost	3,00,000
Cost per Bag (3,00,000/30)	10,000

Minimum Price per bag = ₹10,000.

ANS. 6 (b)

(i) Statement Showing Profitability of Division – A (under different levels)

Sales per day (units)	Rate (₹)	Total Value (₹)	Total Cost	Profit/(Loss) (₹)
1,000	12.00	12,000	15,000	(3,000)
2,000	12.00	24,000	24,000	-
3,000	12.00	36,000	33,000	3,000
4,000	12.00	48,000	42,000	6,000
5,000	12.00	60,000	51,000	9,000
6,000	12.00	72,000	60,000	12,000



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Statement Showing Profitability of Division – B (Under different Levels)

No. of Units	Selling Price	Sale Value	Transfer Price (₹)	Other Mfg. Cost (₹)	Total	Profit/(Loss)
1,000	52.50	52,500	12,000	37,500	49,500	3,000
2,000	39.80	79,600	24,000	45,000	69,000	10,600
3,000	33.00	99,000	36,000	52,500	88,500	10,500
4,000	27.80	1,11,200	48,000	60,000	1,08,000	3,200
5,000	24.00	1,20,000	60,000	67,500	1,27,500	(7,500)
6,000	20.10	1,20,600	72,000	75,000	1,47,000	(26,400)

(ii) (a) Profitability of the Company at the output Level where division A's Net Profit is Maximum:

	₹
Profit of Division A at 6,000 units	12,000
Profit of division B at 6,000 units	(26,400)
Profit/(Loss)	(14,400)

(b) Profitability of the Company at the Output Level where Division B's net profit is maximum:

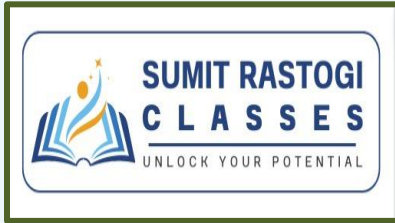
	₹
Profit of Division B at 2,000 units	10,600
Profit of division A at 2,000 units	-
Profit/(Loss)	(10,600)

**(iii) When the Company is not organised on Profit Centre Basis:
 Profit at Different Levels of Output**

Units	Division – A (₹)	Division – B (₹)	Total Profit/(Loss) (₹)
1,000	(3,000)	3,000	Nil
2,000	-	10,600	10,600
3,000	3,000	10,500	13,500
4,000	6,000	3,200	9,200
5,000	9,000	(7,500)	1,500
6,000	12,000	(26,400)	(14,400)

Profit Maximisation Output:

Best Output Level for maximization of profit is 3,000 units.



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ANS. 7 (a)

(i) Target Cost at full capacity:

Selling Price (₹ per unit)	Demand (units)	Capacity Utilization
100	20,000	25%
90	40,000	50%
80	80,000	100%

Selling Price at Full Capacity = ₹80.00

Target Profit = 25% on Sales = ₹20.00

Target Cost at Full Capacity = $(80 - 20) = \text{₹}60.00$ per unit

(ii) Cost Reduction Scheme:

(a) Computation of Variable Cost per unit:

At the Present Capacity of 20,000 units

Selling Price = ₹100.00 per unit

Profit Margin 25% on Sales = ₹25.00

Total Cost = $(100 - 25) = \text{₹}75.00$

Variable Cost = 40% of total cost = 40% of 75 = **₹30.00**

(b) Existing Projections of Total Cost at full capacity:

Total Variable Cost = $(\text{₹}30 \times 80,000) = \text{₹}24.00$ lakhs

Total Fixed Cost = ₹36.00 Lakhs

Total Cost = $(24.00 + 36.00) = 60.00$ lakhs

(c) Target Cost = $(60 \times 80,000) = 48.00$ lakhs

(d) Cost Reduction Scheme:

Cost Reduction Needed = $(\text{Existing Cost} - \text{Target Cost}) = (60.00 - 48.00) = \text{₹}12.00$ lakhs

(iii) Maximum Investment at full capacity:

(a) Target Profit at full Capacity:

Sales $80.00 \times 80,000$ units = ₹64.00 lakhs

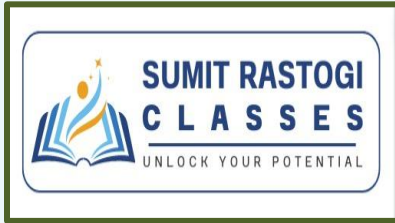
Target Cost = ₹48.00 lakhs

Target Profit = $(64.00 - 48.00) = \text{₹}16.00$ lakhs

(b) Rate of Return on Investment = 16%

(c) Minimum Investment:

Investment Needed = $(\text{Target Profit} \div \text{Target Return on Investment}) = (16.00 \div 16\%) = \text{₹}100.00$ lakhs



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ANS. 7 (b)

(i) Statement of Budgeted Life Cycle revenue and cost:

Particulars	Amount (₹)
Revenue (2,00,000 × 55)	1,10,00,000
Costs:	
Research and Design	8,00,000
Manufacturing Costs:	
Variable Cost (25 × 2,00,000)	50,00,000
Batch (300 × 2,00,000/250)	2,40,000
Fixed Cost	12,00,000
Marketing Costs:	
Variable Costs (3.5 × 2,00,000)	7,00,000
Fixed Cost	8,00,000
Distribution Costs:	
Batch (140 × 2,00,000/100)	2,80,000
Fixed Cost	4,60,000
Customer Service (Variable) 1.7 × 2,00,000	3,40,000
Total Cost	98,20,000
Operating Income	11,80,000

(ii) Budgeted Product Life Cycle Costs for R&D and Design ₹8,00,000

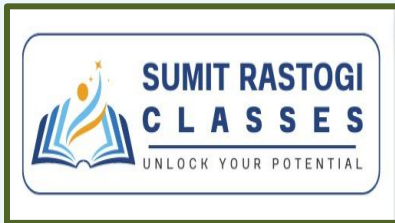
Total budgeted life Cycle product costs ₹98,20,000

Percentage of budgeted product life cycle cost incurred till the R&D and design =
 $\frac{₹8,00,000}{₹98,20,000} = 8.15\%$

(iii) Statement of Revised Budgeted Life Cycle revenue and cost:

Particulars	Amount (₹)
Revenue (2,16,000 × 52.50)	1,13,40,000
Costs:	
Research and Design	8,00,000
Manufacturing Costs:	
Variable Cost (25 × 2,16,000)	54,00,000
Batch (300 × 800)	2,40,000
Fixed Cost	12,00,000
Marketing Costs:	
Variable Costs (3.5 × 2,16,000)	7,56,000
Fixed Cost	8,00,000
Distribution Costs:	
Batch (140 × 2,000)	2,80,000
Fixed Cost	4,60,000
Customer Service (Variable) 1.7 × 2,16,000	3,67,200
Total Cost	1,03,03,200
Operating Income	10,36,800

Decision: Since profit is lower, price should not be reduced.



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ANS. 8 (a)

(i) Calculation of Break-Even Quantity:

	Amount (₹)
Selling Price Per Unit	200
Variable Cost per unit	120
Contribution Per Unit	80
Total Fixed Costs	20,00,000
Break-even Quantity(Units)	25,000

(ii)

(a) Calculation of No. of units to earn a profit of ₹6,00,000:

	Amount (₹)
Total Fixed Costs	20,00,000
Required Profit	6,00,000
Total Contribution required	26,00,000
Contribution per unit	80
Units to be sold to earn a profit of ₹6,00,000	32,500

(b) Calculation of No. of Units to incur a loss of ₹5,00,000:

	Amount (₹)
Total Fixed Costs	20,00,000
Required Loss	5,00,000
Total Contribution required	15,00,000
Contribution per unit	80
Units to be sold to earn a profit of ₹5,00,000	18,750

(iii) Calculation of probability that the company will Break-Even:

To calculate the probability that the company will break even, we have to calculate the cumulative probability of Sales Volume equal to or greater than the 25,000 units i.e., the break-even volume. Therefore, the required probability is 10% + 20% + 30% + 10% + 10% i.e., 80%.

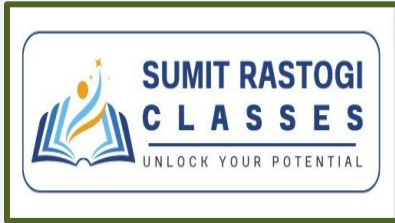
(iv) Calculation of probability of sales volume mentioned at (ii) above:

(a) Required Sales Volume = 32,500 units

Cumulative probability of sales volume being greater than 32,500 units is 30% + 10% + 10% i.e. **50%**.

(b) Required Sales Volume = 18,750 units

Cumulative probability of sales volume being less than 18,750 units is 10%. Further, chances of incurring loss are cumulative probability of sales volume being less than 25,000 units is 10% + 10% i.e. **20%**.



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ANS. 8 (b)

Year	0	1	2	3	4	Present Value	Annuity Factor	Equivalent Annual Cost
12% Disc Factor	1	0.893	0.797	0.712	0.636			
1	-5,000	2,000				3,214	0.893	3,599
2	-5,000	-1,400	200			6,091	1.69	3,604
3	-5,000	-1,400	-1,800	-1,200		8,539	2.402	3,555
4	-5,000	-1,400	-1,800	-1,200	-1,600	10,126	3.038	3,333

Decision: Better to replace at the end of year 4 as the Equivalent annual Cost is the lowest.