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)   A company has a capacity to make 4,00,000 units of a product. It has noted from market conditions that at a price of ₹50 per unit, it can sell 1,00,000 units but the demand would double for each ₹5 fall in the selling price. A minimum margin of 25% is required. The target cost for the company should be:
   (a) ₹ 50   (b) ₹ 40   (c) ₹ 30   (d) ₹ 20

(ii) Division A of a company manufactures a single product and the following data are provided:

   Sales = 25,000 units   Fixed Cost = ₹4,00,000
   Depreciation = ₹2,00,000   Residual Income = ₹30,000
   Net Assets = ₹10,00,000

   Head Office assesses divisional performance by the method of Resudual Income and uses cost of capital of 12%

   (a) ₹25   (b) ₹30   (c) ₹35   (d) None of these.

(iii) ABC Ltd., has correct PBIT of ₹1920 Cr. on total assets of ₹96 Cr. The company proposes to increase assets by ₹24 Cr., which is estimated to increase operating profit before Depreciation by ₹8.4 Cr., and a net increase in Depreciation by ₹4.8 Cr. This will be result in ROI:

   (a) To decrease by 1%   (b) To increase by 1%
   (c) To remain the same   (d) None of these

(iv) A company makes components and sells internally to its subsidiary and also to external market. The external market price is ₹24 per component, which gives a contribution of 40% of sales. For external sales, variable costs include ₹1.50 per unit for distribution costs. This is, however not incurred in internal sales. There are no capacity constraints. To maximize company profit, the transfer price to subsidiary should be:

   (a) ₹ 9.60   (b) ₹ 12.90   (c) ₹ 14.40   (d) None of these

(v)   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

(vi) 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

(vii) In calculating the life cycle costs of a product, which of the following item would be included?

    A. Planning and concept design costs

    B. Preliminary and detailed design costs

    C. Testing costs

    D. Production costs

    E. Distribution costs

    (a) All of the above   (b) D and E   (c) B, D and E   (d) D

(viii) A company is to market a new product. It can produce up to 1,50,000 units of this product. The following area the estimated cost data:

Probability	Fixed Cost	Variable Cost
For production up to 75,000 units	₹8,00,000	60%
Exceeding 75,000 units	₹1,20,000	50%

Sale price is expected to be ₹25 per unit. How many units must the company sell to break even?

    (a) 1,00,000 units   (b) 1,11,000 units   (c) 1,27,000 units   (d) 75,000 units

(ix) SUVAM Ltd., 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 fully capacity if profit margin on sale is taken as 25%?

    (a) ₹67.50   (b) ₹60.00   (c) ₹45.00   (d) None of the above

(x) A company makes and sells a single product. The selling price and marginal revenue equations are:
Selling Price = ₹50 - ₹0.001X
Marginal Revenue = ₹50 - ₹0.002X
Where X is the product the company makes. The variable cost amount to 20 per unit and the fixed costs are ₹1,00,000.
In order to maximize the profit, the selling price should be

    (a) ₹25
    (b) ₹30
    (c) ₹35
    (d) ₹40

Section B

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

2. (a) XYZ Ltd., supports the concept of the Life Cycle Costing for new investment decisions, covering its engineering activities. XYZ Ltd., is to replace a number of its machine and the Chief engineer is to decide between the 'AB' machine, a major expensive machine, with a life of 10 years and the 'CD' machine with an estimated life of 5 years. If the 'CD' machine is chosen, it is likely that it would be replaced at the end of 5 years by another 'CD' machine.

The pattern of maintenance and running costs differs between two types of machine and the relevant data are as given below:

	AB	CD
Purchase Price	19,000	13,000
Trade-in-value	3,000	3,000
Annual repair cost	2,000	2,600
Overhaul cost (p.a.)	4,000	2,000
	(at year 8)	(at year 4)
Estimated financing cost averaged		
Over machine life (p.a.)	10%	10%

Required: Recommend, with supporting figures, which machine to be purchased, stating any assumptions made.

[Given PVIF (10,10) = 0.39
PVIF (10,5) = 0.62
PVIFA (10,10) = 6.15
PVIFA (10,5) = 3.60
PV factor @10% for 4 years = 0.68
PV factor @10% for 8 years = 0.47]

PVIF means present value interest factor.
PVIFA means present value interest factor for any Annuity. [8]

2. (b) An Engineering Company produces product P in its Production Shop 'A'. The overhead recovery rate is 100% of direct wages based on the following budgeted figures:
Direct wages 1,60,000
Variable overheads 64,000
Fixed overheads 96,000
The Production plan for the same budget period envisages an output of 18,000 units of P, whose sales and cost data are as under:

	₹/unit
Selling price	42
Direct materials	12
Direct wages	8
Total overheads	8

The company proposes to use the balance capacity of shop A after completing the above said production plan for the manufacture of component Q, whose cost data are as under:

	₹/unit
Direct materials	8
Direct wages	16
Total overheads	16

The component Q is used by the company in the manufacture of some other product in another production department.

The company receives an export order from abroad for the purchase of 2000 units of product P at ₹30 each. This offer can be accepted by diverting the capacity from component Q. In that event, the company has to buy the component which is available from an outside supplier at a price of ₹40 each.

You are requested to evaluate the alternative courses of action and state with reasons whether the spare capacity should be utilized for the manufacture of:
(i) The component Q or;
(ii) 2000 units of product P for export and buying of the component Q from the outside supplier. [8]

3. (a) B. Ltd makes 3 products, A, B and C. The following information is available: (figures in ₹ Per unit)

Particulars	A	B	C
Selling Price (peak-season)	550	630	690
Selling Price (off-season)	550	604	690
Material Cost	230	260	290
Labour (peak-season)	110	120	150
Labour (off-season)	100	99	149
Variable Production Overhead	100	120	130
Variable Selling Overhead (only for peak-season)	10	20	15
Labour hours required for one unit of production (in hours)	8	11	7

Material Cost and Variable Production Overheads are the same for the peak-season and off-season. Variable Selling Overheads are not incurred in the off-season. Fixed Costs amount to ₹26,780 for each season, of which ₹2,000 is towards Salary for Special Technician, incurred only for product B, and ₹1,780 is the amount that will be incurred on after-sales warranty and free maintenance of only product C, to match competition.

Labour force can be inter-changeable used for all the products. During peak-season, there is labour shortage and the maximum labour hours available are 1,617 hours. During off-season, labour is freely available, but demand is limited to 100 units of A, 115 units of B and 135 units of C, with production facility being limited to 215 units for A, B and C put together.

Your are required to :
1. advise the Company about the best product mix during the peak-season for maximum profit.
2. What will be the maximum profit for the off-season? [12]

3. (b) What is Penetrating Pricing? What are the circumstances in which this policy can be adopted? [4]

4. (a) The summarized results of a company for the two years ended 31st December 2014 and 2015 are given below:-

	2015	2014
	₹ lacs	₹ Lacs
Sales	770	600
Direct Materials	324	300
Direct Wages	137	120
Variable Overheads	69	60
Fixed Overheads	150	80
Profit	90	40

As a result of re-organisation of production methods and extensive advertisement campaign use, the company was able to secure an increase in the selling prices by 10% during the year 2015 as compared to the previous year.

In the year 2014, the company consumed 1,20,000 kgs. of raw materials and used 24,00,000 hours of direct labour.

In the year 2015, the corresponding figures were 1,35,000 kgs. of raw materials and 26,00,000 hours of direct labour.

You are required to:

Use information given for the year 2014 as the base year information to analyse the result of the year 2015 and to show in a form suitable to the management the

amount each factor has contributed by way of price, usage and volume to the change in profit in 2015. [12]

4. (b) State the limitations of Uniform Costing. [4]

5. (a) A company can produce any of its 4 products, A, B, C and D. Only one product can be produced in a production period and this has to be determined at the beginning of the production run. The production Capacity is 1,000 hours. Whatever is produced has to be sold and there is no Inventory build-up to be considered beyond the production period. The following information is given:

Particulars	A	B	C	D
Selling Price (₹ Per unit)	40	50	60	70
Variable Cost (₹ Per unit)	30	20	20	30
No. of units that can be sold	1,000	600	900	600
No. of production hours required per unit of product	1 hour	1 hour and 15 minutes	1 hour and 15 minutes	2 hours

What are the Opportunity Costs of A, B, C and D? [6]

5. (b) A company produces for products, viz. P, Q, R and S. The data relating to production activity are as under

Product	Quantity of Production	Material Cost / unit ₹	Direct labour hours/ unit	Machine hours / unit	Direct Labour cost / unit ₹
P	1,000	10	1	0.50	6
Q	10,000	10	1	0.50	6
R	1,200	32	4	2.00	24
S	14,000	34	3	3.00	18

Production overheads are as under:

	₹
(i) Overheads applicable to machine oriented activity	1,49,700
(ii) Overheads relating to ordering materials	7,680
(iii) Set up costs	17,400
(iv) Administration overheads for spare parts	34,380
(v) Material handling costs	30,294

The following further information have been compiled:

Product	No. of set up	No. of materials orders	No. of times materials handled	No. of spare parts
P	3	3	6	6
Q	18	12	30	15
R	5	3	9	3
S	24	12	36	12

Required:
(i) Select a suitable cost driver for each item of overhead expense and calculate the cost per unit of cost driver.
(ii) Using the concept of activity based costing, compute the factory cost per unit of each product. [10]

6. (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 weekly period? What is the highest weekly balance during the quarter? What is 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

According to the given information, the random number interval is assigned to both the receipts and the payments.   [8]

6. (b) A Company has 4 factories F1, F2, F3 and F4 manufacturing the same product. Production and Raw material costs differ from factory to factory and are given in the table below in the first two rows. The transportation costs from the factories to the sale depots S1, S2 and S3 are also given. The last two columns in the table below give the sales price and total requirements at each depot and the production capacity of each factory given in the last row.

	F1	F2	F3	F4	Sales Price / unit (₹)	Requirement
Production Cost/Unit (₹)	15	18	14	13		
Raw Materials Cost/Unit (₹)	10	9	12	9		
Transportation Cost/Unit (₹)						
S1	3	9	5	4	34	80
S2	1	7	5	4	32	120
S3	5	8	3	6	31	150
Production Capacity	10	150	50	100		

Determine the optimal solution and the associated profit by using the Vogel's Approximation Method (VAM).   [8]

7. (a) A company had planned its operations as follows:

Activity	Duration (days)
1-2	7
2-4	8
1-3	8
3-4	6
1-4	6
2-5	16
4-7	19
3-6	24
5-7	9
6-8	7
7-8	8

(i) Draw the network and find the critical paths.

(ii) After 15 days of working, the following progress is noted:

    (a) Activities 1-2, 1-3, and 1-4 completed as per original schedule.

    (b) Activity 2-4 is in progress and will be completed in 4 more days.

(c) Activity 3-6 is in progress and will need 17 more days to complete.

(d) The staff at activity 3-6 are specialised. They are directed to complete 3-6 and undertake an activity 6-7, which will require 7 days. This re-arrangement arose due to a modification in a specification.

(e) Activity 6-8 will be completed in 4 days instead of the originally planned 7 days.

(f) There is no change in the other activities.

Update the network diagram after 15 days of start of work based on the assumption given above. Indicate the revised critical paths along with their duration.   [10]

7. (b) A company manufactures items X1 and X2 which are sold at a profit of ₹35 per unit of X1 and ₹25 per unit of X2. X1 requires 3 kgs of materials, 4 man-hours and 2 machine-hours per unit. X2 requires 2kgs of materials, 3 man-hours and 2 machine-hours per unit. During each production run, there are 350 kgs, of materials available, 600 man-hours and 550 machine-hours for use.

Formulate under Simplex method of linear programming:

(i) the objective function and the linear constraints, and

(ii) the equations after introducing slack variables

(iii) what are the various methods of solving a linear programming problem?   [6]

8. Write Short Note (Any four)   [4×4]

(a) Socio Economic Costing.

(b) Six Sigma.

(c) Lean Accounting.

(d) Life Cycle Cost.

(e) Margin of Safety.