

ANALYSIS

AND

SUGGESTED ANSWER

OF

ADVANCED MANAGEMENT
ACCOUNTING 2016 (NOV)

ANALYSIS OF ADVANCED MANAGEMENT ACCOUNTING 2016(N) PAPER OF TOTAL MARKS (CHAPTERS WISE)

CHAPTERS	MARKS
Development in Business Environment	24
Decision Making – Cost Concepts	10
Decision Making – CVP Analysis	8
Pricing Decision	8
Transfer Pricing	-
Costing of Service Costing	8
Standard Costing	12
Budget & Budgetary control	13
operational Research	
- Simulation	8
- Learning Curve theory	5
- Assignment	-
- Transportation	8
- CPM and PERT	8
- Linear Programming	8

PRACTICAL AND THEORY WEIGHT IN 2016(NOV) PAPER

	MARKS	% OF TOTAL MARKS
Practical portion	95	79.17%
Theoretical portion	25	20.83
total	120	100

ANALYSIS OF 2016(N) PAPER CHAPTER WISE

ICAI				R S Book			
Q. No.		Chapter	Marks	Module	Q. No.	Page No.	Comments
1	a	Balance score card	5	Class work	23	12.19	Identical problem
	b	Relevant costing	5	Class work	3,8	2.8, 2.9	Identical problem
	c	Shut down decision	5	Home work	19	2.17	Identical problem
	d	Learning Curve	5	Work	1	9.1	Identical problem
2	a	ABC & Target Costing	8	-	-	-	Similar problem
	B	LPP	8	Class work	6	11.6	Similar problem
3	a	Standard costing	8	Class work	19	13.14	Similar problem
	b	critical path Method	8	Class work	31, 32	10.18 and 10.19	Combination of mentioned questions
4	a	Decision making-2	8	Class work	9	3.7	Similar problem
	b	Simulation	8	Class work	5	6.6	Identical problem
5	a	Service costing	8	Class work	24	3.19	Identical problem
	b	Throughput accounting	8	Home work	39	1.32	Identical problem
6	a	Budgeting	8	Class work	30	5.24	Identical problem of 2015(M) edition
	b	Transportation pro	8	Class work	8	8.6	Identical problem
7	a	Standard costing	4	Class work	12	13.1	Identical problem
	b	Uniform Costing	4	Class work	P-14.4	1.55	Direct theory
	c	Synchronous manufacturing	4	Class work	P-9.4	1.32	Direct theory
	d	Pricing decision	4	Class work	P-11	4.3	Direct theory
	e	Pricing decision	4	Class work	P-2, 5	4.1	Direct theory

SUGGESTED ANSWER OF ADVANCED MANAGEMENT ACCOUNTING 2016(N) PAPER

1.

(a)

Y limited is a manufacturing of Cardboard boxes. An analysis of its operating income between 2014 and 2015 shows the following:

	Income Statement (amount in 2014)	Revenue & Cost effect of Growth component in 2015	Revenue & Cost effect of Price recovery component in 2015	Cost effect of productivity component in 2015	Income Statement (amount in 2015)
Revenue(₹)	40,00,000	2,00,000(F)	4,20,000(F)	-	46,20,000
Cost (₹)	29,20,000	60,000(A)	2,56,000(A)	58,000(F)	31,78,000
Operating Income (₹)	10,80,000	1,40,000(F)	1,64,000(F)	58,000(F)	14,42,000

Y limited sold 4,00,000 boxes and 4,20,000 boxes in 2014 and 2015 respectively. During 2015 the market for cardboard boxes grew 3% in terms of number of units and all other changes are due to company's differentiation strategy and productivity.

Required:

Compute how much of the change in operating income from 2014 to 2015 is due to the industry market size factor, productivity and product differentiation and also reconcile the profit of both years due to these factors.

5

IDENTICAL PROBLEM, PAGE NUMBER 12.19, PROBLEM NUMBER 23.

Solution	Computation of change in operating income from 2014 to 2015 due to market size factor <table style="width: 100%;"> <tr> <td>Sales of 2015</td><td style="text-align: right;">4,20,000 boxes</td></tr> <tr> <td>Less: Sales of 2014</td><td style="text-align: right;">4,00,000 boxes</td></tr> <tr> <td>Additional sales quantity or total growth</td><td style="text-align: right;">20,000 boxes</td></tr> <tr> <td>Growth due to change in market size (4,00,000 boxes × 3%)</td><td style="text-align: right;">12,000 boxes</td></tr> <tr> <td>Growth because of product differentiation</td><td style="text-align: right;">8,000 boxes</td></tr> <tr> <td></td><td style="text-align: right;">₹</td></tr> <tr> <td>Net Effect of Growth component</td><td style="text-align: right;">1,40,000</td></tr> <tr> <td>÷ Total growth units</td><td style="text-align: right;">2,00,000</td></tr> <tr> <td></td><td style="text-align: right;">7</td></tr> <tr> <td>Increase in operating income due to change in market size (12,000 boxes × ₹ 7)</td><td style="text-align: right;">84,000</td></tr> <tr> <td>Increase in operating income due to product differentiation (8,000 boxes × ₹ 7)</td><td style="text-align: right;">56,000</td></tr> </table>	Sales of 2015	4,20,000 boxes	Less: Sales of 2014	4,00,000 boxes	Additional sales quantity or total growth	20,000 boxes	Growth due to change in market size (4,00,000 boxes × 3%)	12,000 boxes	Growth because of product differentiation	8,000 boxes		₹	Net Effect of Growth component	1,40,000	÷ Total growth units	2,00,000		7	Increase in operating income due to change in market size (12,000 boxes × ₹ 7)	84,000	Increase in operating income due to product differentiation (8,000 boxes × ₹ 7)	56,000
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Increase in operating income due to product differentiation (8,000 boxes × ₹ 7)	56,000																						

		Computation of change in operating income due to productivity:-		
		Cost effect of productivity in 2015	₹ 58,000 (F)	
		Computation of change in operating income due to product differentiation factor		
		₹		
		Operating income due to revenue & cost effect of price recovery component	1,64,000 (F)	
		Increase in operating income due to growth	56,000 (F)	
			2,20,000 (F)	
		Reconciliation Statement		
		Particulars	(₹)	
		Operating income of 2014	10,80,000	
		Add: Industry market size factor	84,000 (F)	
		Product differentiation factor	2,20,000 (F)	
		Cost leadership factor/productivity component	58,000 (F)	
		Operating income of 2015	14,42,000	
	(b)	Some statements are given below. Identify name of the cost with examples and state whether it is relevant/non-relevant in decision making. (i) Costs are historical costs which have already been incurred and cannot change by any decision made in future. (ii) It is measure of benefits foregone by rejecting the second best alternative of resources in favour of the best. (iii) It is portioning of cost which involves payments to outsiders i.e. it gives rise to cash expenditure as opposed to such costs as depreciation. (iv) Total cost is charged (increase or decrease) due to change in the level of activity, technology or production process or method of production. (v) Cost used in evaluation of a product to reflect the use of resources but that no observable cost.	5	
IDENTICAL PROBLEM, PAGE NUMBER 2.8, 2.9 PROBLEM NUMBER 3, 8.				
Solution		Name of cost	Example	Relevance
		a) Sunk cost	Book value of asset	Irrelevant
		b) Opportunity Cost	Acceptance of new job proposal on rejection of old one	Relevant
		c) Out of pocket cost	Purchase of raw material, Wages payment	Relevant
		d) Differentiation cost	Difference in cost of semi automatic machine and cost of automatic machine	Relevant
		e) Notional cost	Interest cost of idle fund of owners	Irrelevant

	(c)	G Ltd. produces and sells 95,000 units of 'X' in a year at its 80% production capacity. The selling price of product is ₹ 8 per unit. The variable cost is 75% of sales price per unit. The fixed cost is ₹ 3,50,000. The company is continuously incurring losses and management plans to shut-down the plant. The fixed cost is expected to be reduced to ₹ 1,30,000. Additional costs of plant shut-down are expected at ₹ 15,000. Should the plant be shut-down? What is the capacity level of production of shut-down point?	5
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IDENTICAL PROBLEM, PAGE NUMBER 2.17 PROBLEM NUMBER 19 OF HOME WORK AND SOLVED IN CLASS ROOM

Solution

Total Capacity = $\frac{95,000 \text{ units}}{80\%} = 1,18,750 \text{ units}$

Determination of shut down point

Fixed Cost of operation	₹ 3,50,000
(-) Unavoidable fixed cost	₹ 1,30,000
	₹ 2,20,000
(-) Additional Shut Down Cost	₹ 15,000
Avoidable fixed Cost	₹ 2,05,000
÷ Contribution per unit	₹ 2
Shut Down point	1,02,500 units
Shut down as % of total capacity	86.32%
$\frac{1,02,500 \text{ units} \times 100}{1,18,750 \text{ units}}$	

	(d)	A company which has developed a new machine has observed that the time taken to manufacture the first machine is 600 hours. Required: Calculate the time which the company will take to manufacture the second machine if the actual learning curve rate is (i) 80% and (ii) 90%. Explain which of the two learning rates will show faster learning.	5
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IDENTICAL PROBLEM, PAGE NUMBER 9.1, PROBLEM NUMBER 1. HOME WORK AND SOLVED IN CLASS ROOM

Solution	Determination of additional hours required for 2 nd machine		
	Particulars	80%	90%
	Hours required for first machine (A)	600 hours	600 hours
	Average cumulative hours for 2 machines	480 hours	540 hours
		(600 hours × 80%)	(600 hours × 90%)
	Total hours for 2 machines(B × 2 = c)	960 hours	1,080
	Additional hours for 2 nd machine	360 hours	480 hours

2

(a)

Speedo Limited is a specialist car manufacturer that produces various models of cars. The organisation is due to celebrate its 100th anniversary next year. To mark the occasion, Speedo Limited intends to produce a sports car; the Model Royal. As this will be a special edition, production will be limited to 1000 numbers of Model Royal Cars.

Speedo Limited is considering using a target costing approach and has conducted market research to determine the features that consumers require in a sports car. Based on this market research and knowledge of competitor's products, company has decided to price the Model Royal at ₹ 9.75 lacs. Company requires an operating profit margin of 25% of the selling price of the car. Details for the forthcoming year are as follows:

Forecast of direct costs for a Model Royal Car-

Labour	₹ 2,50,000
Material	₹ 4,75,000

Forecast of annual overhead costs -

	₹ in lacs	Cost driver
Production line cost	2310	See note 1
Transportation costs	900	See note 2

Note 1:

The production line that would be used for Model Royal has a capacity of 60,000 machine hours per year. The production line time required for Model Royal is 6 machine hours per car. This production line will also be used to make other cars and will be working at full capacity.

Note 2:

Some models of cars are delivered to showrooms using car transporters. 60% of the transportation costs are related to the number of deliveries made. 40% of the transportation costs are related to the distance travelled.

The car transporters have forecast to make a total of 640 deliveries in the year and carry 10 cars each time. The car transporter will always carry its maximum capacity of 10 cars.

The total annual distance travelled by car transporters is expected to be 2,25,000 kms. 50,000 kms of this is for the delivery of Model Royal cars only. All 1,000 Model Royal cars that will be produced will be delivered in the year using the car transporters.

Required:

(i) Calculate the forecast total cost of producing and delivering a Model Royal car using Activity Based Costing principles to assign the overhead costs.

(ii) Calculate the cost gap that currently exists between the forecast total cost and the target total cost of a Model Royal car.

10

SIMILAR PROBLEM, PAGE NUMBER 1.85, PROBLEM NUMBER 35.

Solution

1)

Speedo Limited
Calculation of total cost of producing and delivering a model Royal Car
(Using Activity Based Costing)

Total units (A)	1,000 units
	(₹)
Material Cost per unit	4,75,000
Add: Labour cost per unit	2,50,000
Prime Cost per unit (B)	7,25,000
Total prime cost (A × B)	72,50,00,000
Add: Overheads cost	
Product Line cost (6,000 × ₹ 3,850)	2,31,00,000
Transportation cost:	
Delivery cost (100 deliveries × ₹ 84,375)	84,37,500
Distance Related cost (50,000 hours × ₹ 160)	80,00,000
Total cost (C)	76,45,37,500
Total cost per unit (C/A)	7,64,537.50

2)

Speedo Limited
Calculation of cost gap

Particulars	(₹)
Selling Price	9,75,000
Less Target Profit (₹ 9,75,000 × 25%)	2,43,750
Target cost per unit (A)	7,31,250
Total Cost per unit (Statement-1) (B)	7,64,537.50
Cost gap (B - A)	33,287.50

Working Notes:

1) Computation of cost per cost driver

Activity	Cost Pool (₹) (A)	Basis	Cost Driver (B)	Cost per cost driver (₹) (A/B)
Product line cost	23,10,00,000	Machine hours	60,000	3,850
Transportation – Delivery Related	5,40,00,000 (900 lakhs × 60%)	No. of deliveries	640	84,375
Transportation – Distance Related	3,60,00,000 (₹ 900 lakhs × 40%)	No. of kms	2,25,000	160

		2) Total no. of deliveries for Royal cars = $\frac{1000}{10}$ = 100 deliveries 3) Machine hours for Royal cars = 1,000 units × 6 hours = 6,000 hours																																					
(b)	A Manufacturing company has 100 kg of A, 180 kg of B and 120 kg of C ingredients available per month. Company can use these materials to make three basic products namely 5 – 10 – 5, 5 – 5 – 10 and 20 – 5 – 10, where the numbers in each case represent the percentage of weight of A, B and C respectively in each of the products. The cost of these raw materials are as follows:	<table><tr><th>Ingredient</th><th>Cost per kg (₹)</th></tr><tr><td>A</td><td>64</td></tr><tr><td>B</td><td>16</td></tr><tr><td>C</td><td>40</td></tr><tr><td>Inert ingredients</td><td>16</td></tr></table> Selling price of these products are ₹ 32.60, ₹ 34.80 and ₹ 36 per kg respectively. There is capacity restriction of the company product 5 – 10 – 5, so that company cannot produce more than 30 kg per month. Only formulate this problem as L.P. Model to determine the productions (in kg) of each product which will maximize its monthly profit.	Ingredient	Cost per kg (₹)	A	64	B	16	C	40	Inert ingredients	16	6																										
Ingredient	Cost per kg (₹)																																						
A	64																																						
B	16																																						
C	40																																						
Inert ingredients	16																																						
IDENTICAL PROBLEM, PAGE NUMBER 11.6, PROBLEM NUMBER 6.																																							
Solution	Let x_1 = No. of units of product 5-10-5 x_2 = No. of units of product 5 – 5 – 10 x_3 = No. of units of product 20 – 5 – 10 Determination of profit per unit <table><tr><th>Product Name</th><th>5 – 10 – 5</th><th>5 – 5 – 10</th><th>20 – 5 – 10</th></tr><tr><td>Assumed Name</td><td>x_1</td><td>x_2</td><td>x_3</td></tr><tr><td>Selling price per unit</td><td>32.60</td><td>34.80</td><td>36.00</td></tr><tr><td>Less: Raw material</td><td></td><td></td><td></td></tr><tr><td>A</td><td>3.20 (64 × 5%)</td><td>3.20 (64 × 5%)</td><td>12.80 (64 × 5%)</td></tr><tr><td>B</td><td>1.60 (16 × 10%)</td><td>0.80 (16 × 5%)</td><td>0.80 (16 × 5%)</td></tr><tr><td>C</td><td>2.00 (40 × 5%)</td><td>4 (40 × 10%)</td><td>4 (40 × 10%)</td></tr><tr><td>Inert ingredients</td><td>12.80 (16 × 80%)</td><td>12.80 (16 × 80%)</td><td>10.40 (16 × 65%)</td></tr><tr><td>Profit per unit</td><td>13.00</td><td>14.00</td><td>8.00</td></tr></table>			Product Name	5 – 10 – 5	5 – 5 – 10	20 – 5 – 10	Assumed Name	x_1	x_2	x_3	Selling price per unit	32.60	34.80	36.00	Less: Raw material				A	3.20 (64 × 5%)	3.20 (64 × 5%)	12.80 (64 × 5%)	B	1.60 (16 × 10%)	0.80 (16 × 5%)	0.80 (16 × 5%)	C	2.00 (40 × 5%)	4 (40 × 10%)	4 (40 × 10%)	Inert ingredients	12.80 (16 × 80%)	12.80 (16 × 80%)	10.40 (16 × 65%)	Profit per unit	13.00	14.00	8.00
Product Name	5 – 10 – 5	5 – 5 – 10	20 – 5 – 10																																				
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C	2.00 (40 × 5%)	4 (40 × 10%)	4 (40 × 10%)																																				
Inert ingredients	12.80 (16 × 80%)	12.80 (16 × 80%)	10.40 (16 × 65%)																																				
Profit per unit	13.00	14.00	8.00																																				

Objective

$$\text{Maximize (Z)} = 13 x_1 + 14 x_2 + 8 x_3$$

Conditions:

Raw Material – A

$$5\% \times x_1 + 5\% \times x_2 + 20\% \times x_3 \leq 100$$

$$= 0.05 x_1 + 0.05 x_2 + 0.20 x_3 \leq 100$$

Raw Material – B

$$10\% \times x_1 + 5\% \times x_2 + 5\% \times x_3 \leq 180$$

$$= 0.10 x_1 + 0.05 x_2 + 0.05 x_3 \leq 180$$

Raw Material – C

$$5\% \times x_1 + 10\% \times x_2 + 10\% \times x_3 \leq 120$$

$$= 0.05 x_1 + 0.10 x_2 + 0.10 x_3 \leq 120$$

Production of product 5 - 10 – 5 cannot be more than 30 kg.

$$x_1 \leq 30$$

Non-negative Condition

$$x_1 \geq 0, x_2 \geq 0 \text{ and } x_3 \geq 0$$

Formulation of given problem

Objective

$$\text{Maximize (Z)} = 13 x_1 + 14 x_2 + 8 x_3$$

Subject to:

$$0.05 x_1 + 0.05 x_2 + 0.20 x_3 \leq 100$$

$$0.10 x_1 + 0.05 x_2 + 0.05 x_3 \leq 180$$

$$0.05 x_1 + 0.10 x_2 + 0.10 x_3 \leq 120$$

$$x_1 \leq 30$$

Where,

$$x_1, x_2, x_3 \geq 0$$

3	(a)	Zed Company manufactures two types of flooring rolls. Budgeted and actual data for 2015 are – <table><tr><th></th><th colspan="3">Static Budget</th><th colspan="3">Actual Result</th></tr><tr><th></th><th>Industrial</th><th>Domestic</th><th>Total</th><th>Industrial</th><th>Domestic</th><th>Total</th></tr><tr><td>Units sales in Rolls (‘000)</td><td>200</td><td>600</td><td>800</td><td>252</td><td>588</td><td>840</td></tr><tr><td>Contribution Margin (₹ in lacs)</td><td>100.00</td><td>240.00</td><td>340.00</td><td>119.70</td><td>246.96</td><td>366.66</td></tr></table> In late 2014, a marketing research estimated industrial volume for industrial and domestic flooring at 80 Lacs Rolls. Actual industry volume for 2015 was 70 Lacs Rolls. Compute: (i) Sales Mix Variance and Sales Quantity Variance by type of flooring rolls and in total. (ii) Market Share Variance and Market Size Variance.		Static Budget			Actual Result				Industrial	Domestic	Total	Industrial	Domestic	Total	Units sales in Rolls (‘000)	200	600	800	252	588	840	Contribution Margin (₹ in lacs)	100.00	240.00	340.00	119.70	246.96	366.66	8
	Static Budget			Actual Result																											
	Industrial	Domestic	Total	Industrial	Domestic	Total																									
Units sales in Rolls (‘000)	200	600	800	252	588	840																									
Contribution Margin (₹ in lacs)	100.00	240.00	340.00	119.70	246.96	366.66																									

IDENTICAL PROBLEM, PAGE NUMBER 13.14, PROBLEM NUMBER 19.

Solution

Determination of Budgeted contribution per unit:

Industrial = $\frac{₹ 100 \text{ lakhs}}{2 \text{ lakhs}} = ₹ 50 \text{ per roll}$

Domestic = $\frac{₹ 240 \text{ lakhs}}{6 \text{ lakhs}} = ₹ 40 \text{ per roll}$

Revised Actual quantity:

Industrial = $\frac{200}{800} \times 8.40 \text{ lakhs} = 2.10 \text{ lakhs}$

Domestic = $\frac{200}{800} \times 8.40 \text{ lakhs} = 6.30 \text{ lakhs}$

(Figure in 000)

Basic calculation for sales variance

Product	AQ × BM			RAQ × BM			BQ × BM		
Product	AQ	BM (₹)	Amount (₹)	RAQ	BM (₹)	Amount (₹)	BQ	BM (₹)	Amount (₹)
Industrial	252	50	12600	210	50	10,500	200	50	10,000
Domestic	588	40	23,520	630	40	25,200	600	40	24,000
	840		36,120	840		35,700	800		34,000

1.

a) Sales Margin Mix Variance = (AQ × BM) – (RAQ × BM)

Industrial = ₹ 12,600 – ₹ 10,500 = ₹ 2,100 (F)

Domestic = ₹ 23,520 – ₹ 25,200 = ₹ 1,680 (A)

Total = ₹ 23,520 – ₹ 35,700 = ₹ 420 (F)

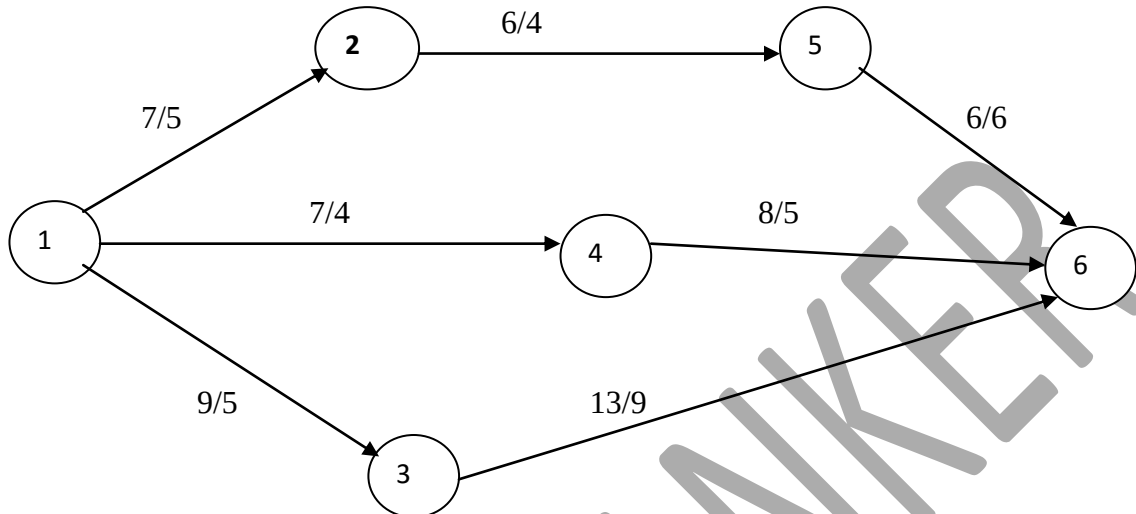
	b) Sales Margin Quantity variance = (RAQ × BM) – (BQ × BM) Industrial = ₹ 10,500 – ₹ 10,000 = ₹ 500 (F) Domestic = ₹ 25,200 – ₹ 24,000 = ₹ 1,200 (F) Total = ₹ 35,700 – ₹ 34,000 = ₹ 1,700 (F) 2. Budgeted Average Contribution = $\frac{₹ 34,000}{800} = ₹ 42.50$ Budgeted Market Share = $\frac{8,00,000 \text{ rolls}}{80,00,000 \text{ rolls}} \times 100 = 10\%$ Actual Market Share = $\frac{8,40,000 \text{ rolls}}{70,00,000 \text{ rolls}} \times 100 = 12\%$ a) Market Size Variance = (Budgeted Industry sales quantity – Actual Industry sales quantity) × Budgeted Average contribution per unit = 10% (70,000 rolls – 80,000 rolls) × ₹ 42.50 = 42,500 (A) b) Market Share Variance = Actual Industry Sales quantity × (Actual Market Share % - Budgeted Market Share %) × Budgeted Average Contribution per unit = 70,000 (12% - 10%) × ₹ 42.50 = 59,500 (F)																																					
(b)	The following table shows for each activity needed to complete the road construction project, the normal time, the shortest time in which the activity can be completed and cost per day for reducing the time of each activity. The contract includes a penalty clause of ₹ 80 per day over 19 days. The overhead cost is ₹ 150 per day. The cost of completion the eight activities in normal time is ₹ 6,000. <table><thead><tr><th>Activity</th><th>Normal time in days</th><th>Shortest time in days</th><th>Cost of reduction per day (₹)</th></tr></thead><tbody><tr><td>1 - 2</td><td>7</td><td>5</td><td>90</td></tr><tr><td>1 - 3</td><td>9</td><td>5</td><td>100</td></tr><tr><td>1 - 4</td><td>7</td><td>4</td><td>40</td></tr><tr><td>2 - 4</td><td>4</td><td>4</td><td>-</td></tr><tr><td>2 - 5</td><td>6</td><td>4</td><td>50</td></tr><tr><td>3 - 6</td><td>13</td><td>9</td><td>210</td></tr><tr><td>4 - 6</td><td>8</td><td>5</td><td>60</td></tr><tr><td>5 - 6</td><td>6</td><td>6</td><td>-</td></tr></tbody></table> Required: (i) Draw the network diagram for the project and identify the critical path and show normal duration and minimum duration of different paths. (ii) Calculate the total cost associated to normal duration of the project. (iii) Crash the relevant activities systematically and determine the lowest cost and associated time.	Activity	Normal time in days	Shortest time in days	Cost of reduction per day (₹)	1 - 2	7	5	90	1 - 3	9	5	100	1 - 4	7	4	40	2 - 4	4	4	-	2 - 5	6	4	50	3 - 6	13	9	210	4 - 6	8	5	60	5 - 6	6	6	-	8
Activity	Normal time in days	Shortest time in days	Cost of reduction per day (₹)																																			
1 - 2	7	5	90																																			
1 - 3	9	5	100																																			
1 - 4	7	4	40																																			
2 - 4	4	4	-																																			
2 - 5	6	4	50																																			
3 - 6	13	9	210																																			
4 - 6	8	5	60																																			
5 - 6	6	6	-																																			

IDENTICAL PROBLEM, PAGE NUMBER 31 AND 31, PROBLEM NUMBER 10.18 AND 10.19.

IDENTICAL PROBLEM, PAGE NUMBER 31 AND 31, PROBLEM NUMBER 10.18 AND 10.19.

Solution

1)

Network Diagram**2) Paths and their normal duration and minimum duration**

Path	Normal Duration	Minimum duration
1 – 2 – 5 – 6	$7 + 6 + 6 = 19$	$5 + 4 + 6 = 15$
1 – 2 – 4 – 6	$7 + 4 + 8 = 19$	$4 + 5 + 5 = 14$
1 – 4 – 6	$7 + 8 = 15$	$4 + 5 = 9$
1 – 3 – 6	$9 + 13 = 22$	$5 + 9 = 14$

Critical Path with highest normal duration is 1 – 3 – 6 where duration is 22 days.

Whereas

Critical Path with minimum duration is 1 – 2 – 5 – 6 is 15 days.

Determination of total cost associated to Normal duration of the project

	₹
Direct Cost	6,000
Add: Overhead cost (22 days × ₹ 150)	3,300
Add: Penalty (22 days – 19 days) × ₹ 80	240
Total	9,540

3. Crashing:**Stage-1**

Crashing of Activity 1 – 3 by 1 day

Revised Duration after stage 1 crashing:

$$1 - 2 - 5 - 6 = 7 + 6 + 6 = 19$$

$$1 - 2 - 4 - 6 = 7 + 4 + 8 = 19$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 8 + 13 = 21$$

Stage-2:

Crashing of Activity 1 – 3 by 1 day

Revised Duration after stage 2 crashing:

$$1 - 2 - 5 - 6 = 7 + 6 + 6 = 19$$

$$1 - 2 - 4 - 6 = 7 + 4 + 8 = 19$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 7 + 13 = 20$$

Stage-3:

Crashing of Activity 1 – 3 by 1 day

Revised Duration after stage 3 crashing:

$$1 - 2 - 5 - 6 = 7 + 6 + 6 = 19$$

$$1 - 2 - 4 - 6 = 7 + 4 + 8 = 19$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 6 + 13 = 19$$

Stage-4

Crashing of Activity 1 – 2 and 1 – 3 by 1 day

Revised Duration after stage 4 crashing:

$$1 - 2 - 5 - 6 = 6 + 6 + 6 = 18$$

$$1 - 2 - 4 - 6 = 6 + 4 + 8 = 18$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 5 + 13 = 18$$

Stage-5

Crashing of activity 1 – 2 and 3 – 6 by one day:

Revised duration after stage 5 crashing:

$$1 - 2 - 5 - 6 = 5 + 6 + 6 = 17$$

$$1 - 2 - 4 - 6 = 5 + 4 + 8 = 17$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 5 + 12 = 17$$

Stage-6

Crashing of 2- 5, 4 – 5 and 3 – 6 by one day:

$$1 - 2 - 5 - 6 = 5 + 5 + 6 = 16$$

$$1 - 2 - 4 - 6 = 5 + 4 + 7 = 16$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 5 + 11 = 16$$

Stage-7:

Crashing of activity 2 – 5, 4 – 6, and 3 – 6 by one activity

$$1 - 2 - 5 - 6 = 5 + 4 + 6 = 15$$

$$1 - 2 - 4 - 6 = 5 + 4 + 6 = 15$$

$$1 - 4 - 6 = 7 + 8 = 15$$

$$1 - 3 - 6 = 5 + 10 = 15$$

Statement of total cost

	Stage-1	Stage-2	Stage-3	Stage-4	Stage-5	Stage-6	Stage-7
Project Duration	21	20	19	18	17	16	15
	₹	₹	₹	₹	₹	₹	₹
Normal cost	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Add: Crashing Cost							
1-3	100	200	300	400	400	400	400
1-2	-	-	-	90	180	180	180
3-6	-	-	-	-	210	420	630
2-5	-	-	-	-	-	50	100
4-6	-	-	-	-	-	60	120
Add: Overhead cost	3,150	3,000	2,850	2,700	2,550	2,400	2,250
Add: Penalty	160	80	-	-	-	-	-
Total Cost	9,410	9,280	9,150	9,190	9,340	9,510	9,680

Crashing should be made up to 19 days.

variable production costs are as follows:				
Product	P	Q	R	S
Demand (Units)	1,20,000	1,86,000	1,71,000	99,000
	₹	₹	₹	₹
Selling price/unit	23.88	28.68	55.08	47.88
Direct Material/unit	10.08	13.20	30.48	24.96
Direct Labour/unit	4.08	4.08	6.72	6.36
Variable overhead/unit	1.44	1.44	2.4	2.16
Other data:				
(i) The variable overheads are absorbed on a machine hour basis at a rate of ₹ 1.20 per machine hour.				
(ii) Fixed overheads total ₹ 46,84,000.				
(iii) Production P, Q and R can be brought in at ₹ 21.36 per unit, ₹ 24 per unit and ₹ 48 per unit respectively.				
You are required to calculate the best product mix for the year and the resulting optimal profit.				

SIMILAR PROBLEM, PAGE NUMBER 3.7, PROBLEM NUMBER 9.

Solution	Statement of contribution per and ranking of products:				
	Particulars	P	Q	R	S
	Selling price (A) (₹)	23.88	28.68	55.08	47.99
	Direct Material	10.08	13.20	30.48	24.96
	Direct Labour	4.08	4.08	6.72	6.36
	Variable O/h (B)	1.44	1.44	2.40	2.16
	Variable Manufacturing cost per unit (C)	15.60	18.72	39.60	33.48
	Contribution per unit on manufacturing (A – C = D)	8.28	9.96	15.48	14.40
	Machine hour per unit (B ÷ ₹ 1.20 = E)	1.20	1.20	2.00	1.80
	Contribution per hour of manufacturing (D ÷ E)	6.90	8.30	7.74	8.04
	Ranking on the basis of manufacturing	IV	I	III	II
	Cost of purchase (F)	21.36	24	48	-
	Saving in Manufacturing (F – C = G)	5.76	5.28	8.40	-
	Saving per hour in manufacturing instead of buying (G)	4.80	4.4	4.20	-
	Ranking for manufacturing instead of buying	I	II	III	-
	Contribution per unit on buying on product (A - F)	2.52	4.68	7.08	-
If machine hours are available after allocation of products P, Q And S then it may be allocated to Product R.					

		Statement of Product mix					
		Product	Required Hours	Allocation	Production		
		P	1,44,000	1,44,000	1,20,000		
		Q	2,23,200	2,23,200	186,000		
		R	3,42,000	2,69,600 (Bal. fig)	1,34,800		
		S	1,78,200	1,78,200	99,000		
		Total	8,87,400	8,15,000			
		Statement of optimal profit					
		Particulars			(₹)		
		Contribution from manufacturing					
		P (1,20,000 units × ₹ 8.28)			9,93,600		
		Q (1,86,000 × ₹ 9.96)			18,52,560		
		R (1,34,800 units × ₹15.48)			20,86,704		
		S (99,000 units × ₹ 14.40)			14,25,600		
		Contribution from purchase					
		R (1,71,000 – 1,34,800) × ₹7.08			2,56,296		
		Total Contribution			66,14,760		
		Less: Fixed Cost			46,84,000		
		Profit			19,30,760		
	(b)	A book-store wishes to carry Systems Analysis and Design in stock. Demand is probabilistic and replenishment of stock takes 2 days (i.e., if an order is placed in March 1, it will be delivered at the end of the day on March 3). The probabilities of demand are given below:					
		Demand (daily):	0	1	2	3	4
		Probability:	0.05	0.10	0.30	0.45	0.10
		Each time an order is placed, the store incurs an ordering cost of Rs.100 per order. The store also incurs a carrying cost of Rs. 5.00 per book per day. The inventory carrying cost is calculated on the basis of stock at the end of each day. The manger of the book-store wishes to compare two options for his inventory decision:					
		1. Order 5 books, when the inventory at the beginning of the day plus orders outstanding is less than 8 books.					
		2. Order 8 books, when the inventory at the beginning of the day plus orders outstanding is less than 8 books.					
		Currently (beginning of the first day) the store has stock of 8 books plus 6 books ordered 2 days ago and expected to arrive next day. Further it can be assumed that the demand					

occurring during the day can be met out of stock received at the end of the day.

Required:

Using Monte-Carlo simulation for 10 days, recommend which option the manager should choose?

The two digits random numbers are given below:

89, 34, 78, 63, 61, 81, 39, 16, 13, 73

IDENTICAL PROBLEM, PAGE NUMBER 6.6, PROBLEM NUMBER 5 .

Solution

Statement of range of random number

Demand	Probability	Cumulative Probability	Range of R. No.
0	0.05	0.05	00 - 04
1	0.10	0.15	05 - 14
2	0.30	0.45	15 - 44
3	0.45	0.90	45 - 89
4	0.10	1.00	90 - 99

Option-I

Statement of simulation of number of order and stock position

S. No.	R. No.	Demand	Opening Stock	Order			Sales	Closing Stock
				Outstanding	Received	Placed		
1	89	3	8	6	-	-	3	5
2	34	2	5	6	6	-	2	9
3	78	3	9	-	-	-	3	6
4	63	3	6	-	-	5	3	3
5	61	3	3	5	-	-	3	0
6	81	3	0	5	5	5	3	2
7	39	2	2	5	-	5	2	0
8	16	2	0	10	5	-	2	3
9	13	1	3	5	5	-	1	7
10	73	3	7	-	-	5	3	4
Total								39

Total number of orders = 4

Determination of cost of carrying and ordering cost

	₹
Cost of order place ($₹ 100 \times 4$)	400
Add: Cost of carrying inventory (39 units $\times$ 5.00)	195

		Total							595.00
		Option-2							
		Statement of simulation of number of orders and stock position							
S. No.	R. No.	Demand	Opening Stock	Order			Sales	Closing Stock	
				Outstanding	Received	Placed			
1	89	3	8	6	-	-	3	5	
2	34	2	5	6	6	-	2	9	
3	78	3	9	-	-	-	3	6	
4	63	3	6	-	-	8	3	3	
5	61	3	3	8	-	-	3	0	
6	81	3	0	8	8	-	3	5	
7	39	2	5	-	-	8	2	3	
8	16	2	3	8	-	-	2	1	
9	13	1	1	8	8	-	1	8	
10	73	3	8	-	-	-	3	5	
Total							45		
		Total number of orders = 2							
		Determination of cost of carrying and ordering cost							
		₹							
		Cost of order place (₹ 100 × 2 orders)							200.00
		Add: Cost of carrying inventory (45 units × 5.00)							225.00
		Total							425.00
		Suggestion: Option B should be selected because it is lower than option A.							
5	(a)	The budget of a hotel for the year 2016 shows following room occupancy:							10
		Quarter	January – March	April – June	July – September	October – December			
		Average occupancy %	45	60	90	55			
		Revenue for the year is estimated to be ₹ 60,00,000 and arises from three profit centres namely Accommodation *45%, Restaurant 35% and Bar 20%.							
		* The accommodation revenue is earned from several different categories of guests each of which pays a different rate per room.							

The three profit centres have following percentage of margin:

	Accommodation	Restaurant	Bar
	(%)	(%)	(%)
Revenue	100	100	100
Wages	20	30	15
Cost of sale	-	35	50
Direct cost	10	15	5
Gross Margin	70	20	30

Fixed cost for the year is estimated to be ₹ 9,15,000.

As a means of improving the budgeted profitability by 20%, following two suggestions have been made:

- (1) To offer special two night holidays at a reduced price of ₹ 250/- per night. It is expected that those accepting the offer would spend an amount equal to 40% of the accommodation charges in the restaurant and 40% of the accommodation charges in the bar.
- (2) To increase price Management is confident that there will be no drop in volume of sales if restaurant prices are increased by 7.5% and bar prices by 10%. Accommodation prices would also need to be increased.

You are required to :

- (i) Calculate the budgeted profit.
- (ii) How many two night holidays would need to be sold each week in three quarters, totaling 39 weeks, when occupancy is less, to achieve the desired profitability as per suggestion (1) ?
- (iii) By what percentage the prices of accommodation would need to be increased as per suggestion (2) to achieve the desired profitability ?

IDENTICAL PROBLEM, PAGE NUMBER 3.19, PROBLEM NUMBER 24.

Solution

1. Statement of Budgeted Profit

Particulars	Accommodation	Restaurant	Bar	Total
	₹	₹	₹	₹
Revenue	27,00,000	21,00,000	12,00,000	60,00,000
(-) Variable Costs				
Wages	5,40,000	6,30,000	1,80,000	13,50,000
Cost of Sales	-	7,35,000	6,00,000	13,35,000
Direct Cost	2,70,000	3,15,000	60,000	6,45,000
Total Contribution	18,90,000	4,20,000	3,60,000	26,70,000
Less: Total Fixed Cost				9,15,000
Budgeted Profit				17,55,000

2. Statement of Number of two-nights holidays to be sold				
Particulars				₹
Required increase in profit (₹ 17,55,000 × 20%)				3,51,000
÷ Contribution per two night:				
Accommodation (₹ 250 × 70% × 2)				₹ 350
Restaurant (40% × ₹ 500 × 20%)				₹ 40
Bar {(40% × ₹ 250) × 30%}				₹ 60
No. of 2 nights holidays to be sold				780
No. of 2 nights holidays to be sold per week ($\frac{780}{39}$)				20

3. Determination of % increase in accommodation price				
				₹
Additional contribution required				3,51,000
(-) Additional Revenue from				
- Restaurant (₹ 21,00,000 × 7.5%)				1,57,500
- Bar (₹ 12,00,000 × 10%)				1,20,000
Additional Revenue required from accommodation				73,500
% increase in Accommodation change ($\frac{₹ 73,500}{₹ 27,00,000} \times 100$)				2.72%

(b)	ABC Ltd. produces three products A, B and C. The following information is available for a period:				6
	Product	A	B	C	
	Contribution per unit (Sales – Direct Materials) (₹)	30	25	15	

Machine hours required per unit of Production:

	Machine hours required per unit			Throughput Accounting Ratio
Product	A	B	C	
Machine 1	10	2	4	133.33%
Machine 2	15	3	6	200.00%
Machine 3	5	1	2	66.67%

Estimated sales demand for A, B and C are 500 units each and machine capacity is limited to 6,000 hours for each machine.

Required:

Analyse the above information and apply theory of constraints process to remove the constraints. How many units of each product will be made?

IDENTICAL PROBLEM, PAGE NUMBER 1.32, PROBLEM NUMBER 39 OF H.W ALSO IN CLASS WORK				
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Solution	Machine 2 is bottleneck resource because it has highest through put accounting ratio. Ranking of product and product mix should be based on machine 2 capacity.
Statement of Ranking	
Particulars	A B C
Throughput Contribution (₹)	30 25 15
÷ Required Machine hours per unit	15 3 6
Through put contribution per hour	2 8.33 2.50
Ranking	III I II
Statement of Product Mix	
Rank	Product R. Hours Allocation Production
III	A 7,500 1,500 100
I	B 1,500 1,500 500
II	C 3,000 3,000 500

6	(a)	From the information given below, prepare a cash budget of the company for the first half of 2016, assuming that cost would remain unchanged.	8
		a) Sales are both on credit and for cash, the latter being one third of the former; b) Realisations from debtors are 25% in the month of sale; 60%, in month following that and the balance in the month after that; c) Company's policy of selling price is 25% over cost; d) Budgeted sales of each month are purchased and paid for in the preceding month; e) Rent payable is Rs. 2,000 per month. f) Sales forecast for the different months are: 2015 – October - ₹ 160,000; November - ₹ 1,80,000; December ₹ 2,00,000; 2016 - January ₹ 2,20,000; February - ₹ 1,40,000; March- ₹ 1,60,000; April - ₹ 1,50,000; May ₹ 2,00,000; June - ₹ 1,80,000 and July - ₹ 1,20,000. g) The company has outstanding debentures of Rs. 2 lakhs on 1st January carry interest at 15% per annum payable on the last date of each quarter on calendar year basis. 20% of debentures are due for redemption on 30 June 2016. h) The company has to pay advance tax on ₹ 54,000 in March. i) Anticipated office costs for the six-month period are; January ₹ 25,000; February ₹ 20,000; March ₹ 40,000; April ₹ 35,000; May ₹ 30,000 and June ₹ 45,000; j) The opening cash balance is ₹ 10,000 on January 1, 2016.	

IDENTICAL PROBLEM, PAGE NUMBER 9.1, PROBLEM NUMBER 5.24. 2015(M) EDITION

Solution

Cash Budget
For first half of 2016

	Jan ₹	Feb ₹	March ₹	April ₹	May ₹	June ₹
Opening Balance	10,000	77,500	1,10,250	44,500	875	(2,125)
Add: Receipts						
Cash Sales	55,000	35,000	40,000	37,500	50,000	45,000
Collection from Debtors	1,51,500	1,47,750	1,17,750	1,15,875	1,23,000	1,40,625
Total Receipts	2,06,500	1,82,750	1,57,750	153,375	1,73,000	1,85,625
Less: Payments						
Purchase	1,12,000	1,28,000	1,20,000	1,60,000	1,44,000	96,000
Rent	2,000	2,000	2,000	2,000	2,000	2,000
Deb Interest (2,00,000 × 15% × 3/12)	-	-	7,500	-	-	7,500
Redemption of Deb (2,00,000 × 20%)	-	-	-	-	-	40,000
Advance Tax	-	-	54,000	-	-	-
Office Cost	25,000	20,000	40,000	35,000	30,000	45,000
Total Payments	1,39,000	1,50,000	2,23,500	1,97,000	1,76,000	1,90,000
Closing Balance (A + B - C)	77,500	1,10,250	44,500	875	(2,215)	(7,000)

Working Notes:

1. Receipts from Sundry Debtors

Particulars	Nov ₹	Dec ₹	Jan ₹	Feb ₹	Mar ₹	Apr ₹	May ₹	Jun ₹
Total sales	1,80,000	2,00,000	2,20,000	1,40,000	1,60,000	1,50,000	2,00,000	1,80,000
(-) Cash Sales	45,000	50,000	55,000	35,000	40,000	37,500	50,000	45,000
Credit Sales	1,35,000	1,50,000	1,65,000	1,05,000	1,20,000	1,20,000	1,12,500	1,50,000
Collection from debtors								
- 25% in current month			41,250	26,250	30,000	28,125	37,500	33,750
- 60% in next month			90,000	90,000	63,000	72,000	67,500	90,000
- Balance 15% in next month			20,250	22,500	24,750	15,750	18,000	16,875
Total Collection			1,51,500	1,47,750	1,17,750	1,15,875	1,23,000	1,40,625

2. Payment to creditors

Particulars	Jan ₹	Feb ₹	March ₹	April ₹	May ₹	June ₹	July ₹
Sales (A)	2,20,000	1,40,000	1,60,000	1,50,000	2,00,000	1,80,000	1,20,000
Cost (A × 4/5)	1,76,000	1,12,000	1,28,000	1,20,000	1,60,000	1,44,000	96,000
Purchases	1,12,000	128,000	1,20,000	1,60,000	1,44,000	96,000	

(b)

The following table shows all the necessary information on the available supply to each warehouse, the requirement of each market and the unit transportation cost from each warehouse to each market.

Warehouse	Market				Supply
	I	II	III	IV	
A	5	2	4	3	22
B	4	8	1	6	15
C	4	6	7	5	8
Requirements	7	12	17	9	

The shipping clerk has worked out the following schedule from his experience:

12 Units from A to II, 1 Unit from A to III

9 Units from A to IV, 15 Units from B to III

7 Units from C to I and 1 Unit from C to III

You are required to answer the following:

- Check and see if the clerk has the optimal schedule;
- Find the optimal schedule and minimum total shipping cost; and
- If the clerk is approached by a carrier of route C to II, who offers to reduce his rate in the hope of getting some business, by how much should the rate be reduced before the clerk should consider giving him an order?

IDENTICAL PROBLEM, PAGE NUMBER 8.6, PROBLEM NUMBER 8.

Solution

(i) Initial solution by shipping clerk

Warehouse	Markets			
	I	II	III	IV
A	5	12	1	9
B	4	8	15	6
C	7	4	1	5

Number of allocated cells are equal to $m + n - 1$ i.e. 6 hence we may go for optimality test.

Optimality Test: Determination of value of U_i and V_j by using formula $C_{ij} = U_i + V_j$ and opportunity cost of unallocated cells by using formula $\Delta_{ij} = C_{ij} - (U_i + V_j)$

Warehouse	Markets				
	I	II	III	IV	
A	(4) 5	(12) 2	(1) 4	(9) 3	$U_1 = 4$
B	(6) 4	(9) 8	(15) 1	(6) 6	$U_2 = 1$
C	(7) 4	(1) 6	(1) 7	(-1) 5	$U_3 = 7$
	$V_1 = -3$	$V_2 = -2$	$V_3 = 0$ (Assumed)	$V_4 = -1$	

Solution is not optimal because one of the opportunity cost is negative.

(ii) One opportunity cost of unallocated cell value is negative hence need of reallocation of allocated units by using loop.

Matrix after loop

Warehouse	Markets			
	I	II	III	IV
A	(4) 5	(12) 2	(1) 4	(9) 3
B	(6) 4	(9) 8	(15) 1	(6) 6
C	(7) 4	(1) 6	(1) 7	(-1) 5

Diagram illustrating the loop for reallocation:

```

    A(1) → A(4) → B(4) → C(4) → A(1)
    A(1) is the cell with opportunity cost -1.
    A(4) is the cell with allocated units 4.
    B(4) is the cell with allocated units 4.
    C(4) is the cell with allocated units 4.
    The loop is formed by these four cells.
  
```

Number of re-allocated units should be least of allocated units on $-\theta$ i.e. 1. Addition at the point of $+\theta$ and subtraction at the point of $-\theta$.

Matrix after reallocation

Warehouse	Markets			
	I	II	III	IV
A		(12) 2	(1) 4	(9) 3
B			(15) 1	
C	(7) 4			(1) 5

Optimality Test: Determination of value of U_i and V_j by using formula $C_{ij} = U_i + V_j$ and

opportunity cost of unallocated cells by using formula $\Delta_{ij} = C_{ij} - (U_i + V_j)$

Warehouse	Markets				
	I	II	III	IV	
A	(3) 5	(12) 2	(2) 4	(8) 3	$U_1 = 0$ (Assumed)
B	(5) 4	(9) 8	(15) 1	(6) 6	$U_2 = -3$
C	(7) 4	(1) 6	(1) 7	(1) 5	$U_3 = 2$
	$V_1 = 2$	$V_2 = 2$	$V_3 = 4$	$V_4 = 3$	

All Opportunity costs are non-negative hence above solution is optimum.

Determination of minimum transportation cost

Warehouse	Market	Units	Cost per unit	Cost
A	II	12	2	24
A	III	2	4	8
A	IV	8	3	24
B	III	15	1	15
C	I	7	4	28
C	IV	1	5	5
Total				104

(iii) Clerk may allocate some allocation to C to II if Transportation cost per unit will be reduced by ₹ 3 per unit because it must be lesser than cost of routes C to I and C to IV.

Allocation may be determined by re-allocation using loop:

Warehouse	Markets				
	I	II	III	IV	
A	5	(12) $-\theta$	(2) $+\theta$	(8) $+\theta$	$U_1 = 0$ (Assumed)
B	4	8	(15) 1	6	$U_2 = -3$
C	(7) 4	$+\theta$ 6	7	(1) $-\theta$ 5	$U_3 = 2$
	$V_1 = 2$	$V_2 = 2$	$V_3 = 4$	$V_4 = 3$	

Number of re-allocated units should be least of allocated units on $-\theta$ i.e. 1. Addition at the point of +

θ and subtraction at the point of $-\theta$:						
Warehouse		Markets				
		I	II	III	IV	
A		5	11 2	2 4	9 3	$U_1 = 0$ (Assumed)
B		4	8	15 1	6	$U_2 = -3$
C		7 4	1 6	7	5	$U_3 = 2$
		$V_1 = 2$	$V_2 = 2$	$V_3 = 4$	$V_4 = 3$	
No need of further optimality test because solution is already optimal.						
Determination of minimum transportation cost						
Warehouse		Market		Units	Cost per unit	Cost
A		II		11	2	22
A		III		2	4	8
A		IV		9	3	24
B		III		15	1	15
C		I		7	4	28
C		II		1	3	3
		Total				103
7	Answer any four out of the following five questions:					
(a)	A company manufactures two products X and Y. Product X requires 5 hours to produce while Y requires 10 hours. In a month of 25 effective working days of 8 hours a day, 1,000 units of X and 600 units of Y were produced. The company employs 50 workers in the production department to produce X and Y. The budgeted hours are 1,02,000 for the year. Calculate capacity ratio, activity ratio and efficiency ratio. Also establish their inter-relationship.					4
IDENTICAL PROBLEM, PAGE NUMBER 13.1, PROBLEM NUMBER 12.						
Solution	Determination of Standard hours produced by company					
Particulars		Product X		Product Y	Total	
Output (units)		1,000		600		
Required hours per unit		5		10		
Total		5,000		6,000	11,000	
Total Budgeted hours = $1,02,000/12 = 8,500$ hours						

		Actual hours worked = 50 workers × 25 Days × 8 hours = 10,000 hours Calculation of Ratio: Capacity Ratio = $\frac{\text{Actual Hours}}{\text{Budgeted Hours}} \times 100 = \frac{10,000 \text{ Hours}}{8,500 \text{ Hours}} \times 100 = 117.65\%$ Efficiency Ratio = $\frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100 = \frac{11,000 \text{ Hours}}{10,000 \text{ Hours}} \times 100 = 110\%$ Activity Ratio = $\frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100 = \frac{11,000 \text{ Hours}}{8,500 \text{ Hours}} \times 100 = 129.41\%$ Inter-relationship Activity Ratio = Efficiency Ratio × Capacity Ratio = 110% × 117.65 = 129.41%	
	(b)	State the limitations of uniform costing.	4
DIRECT THEORY, POINT NO. 14.4 AND PAGE NUMBER 1.55			
		LIMITATION OF UNIFORM COSTING: [Imp] (a) Sometimes it is not possible to adopt uniform standards, methods and procedures of costing in different firms due to differing circumstances in which they operate. (b) Many firms do not wish to share such information with their competitors in the same industry. (c) Small firms in an industry believe that uniform costing system is only meant for big and medium size firms, because they cannot afford it. It induces monopolistic trend in the business, due to which prices may be increased artificially and supplies withheld.	
	(c)	Briefly explain the principles associated with synchronous manufacturing.	4
DIRECT THEORY, POINT NO. 9.2 AND PAGE NUMBER 1.32			
		PRINCIPLES OF SYNCHRONOUS MANUFACTURING: [2010(M)] (5 Marks) i. Focus on synchronizing the production flow than on idle capacities. ii. Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck. iii. Value of time at a non-bottleneck resource is negligible. iv. Level of utilization of a non-bottleneck resource controlled by other constraints within the system. v. Resources must be utilized, not simply activated. vi. Transfer batch should not be equal to the process batch. A process batch should be variable both along its route and overtime.	
	(d)	Enumerate the uses of Pareto Analysis.	4
DIRECT THEORY, POINT NO. 9 AND PAGE NUMBER 4.3			

Ans:	USES OF PARETO ANALYSIS: (a) To prioritize problems, goals and objectives. (b) To identify root causes. (c) To select and define key quality improvement programs. (d) To select key customer relations and service programs. (e) To select key employee relations improvement programs. (f) To select and define key performance improvement programs. (g) To allocate physical, financial and human resources. (h) To maximize research and product development processes.		
(e)	Distinction clearly between the skimming pricing policy and penetration pricing policy.		4
DIRECT THEORY, POINT NO. 2 & 5 AND PAGE NUMBER 4.1			
Ans:	PENETRATION PRICING: - Penetration pricing is a policy of low prices when the product is first launched in order to obtain sufficient penetration into the market. - It is opposite to skimming pricing. SKIMMING PRICING: - Skimming pricing involves charging high prices when a product is first launched and spending heavily on advertising and sales promotion to obtain sales.		

We mainly focus on analytical way of thinking about subject not only to crack or solve questions based on some remember based aspects. As we know most analytical paper of CA Final is Advanced Management Accounting hence there is need of go for analytical and entertaining way of study not on boring and uninteresting pattern.

One more thing we can score best in Advanced Management Accounting in compare to any papers of CA Final.

Think about your opportunity cost of 6 months and give proper importance of Advanced Management Accounting because this subject is future for CA/CMA profession.

We cover following in our class and make you competent to handle each and every question in any circumstances.

1. ICAI Module.
2. ICAI Practice Manual.
3. Suggested answer by ICAI.
4. Last 10 attempts RTP.
5. Compilation issued by ICAI.
6. Scanner.
7. Other sources also

“DO NOT BELIEVE IN A THING BECAUSE YOU HAVE READ ABOUT IT IN A BOOK. DO NOT BELIEVE IN A THING BECAUSE ANOTHER MAN HAS SAID IT WAS TRUE. DO NOT BELIEVE IN WORDS BECAUSE THEY ARE HALLOWED BY TRADITION. FIND OUT THE TRUTH FOR YOURSELF. REASON IT OUT. THAT IS REALIZATION.”

SWAMI VIVEKANANDA

CA RAVI SHANKER

Advanced Management Accounting (Costing & OR) Theory and Practical for CA FINAL



By
CA RAVI SHANKER
(B.Com(H), CA, CMA) **EIRC & NIRC TOPPER**

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