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SUGGESTED SOLUTION

CA FINAL NOVEMBER 2016 EXAM

ADVANCED MANAGEMENT ACCOUNTING

Test Code - F N J 60 5 0

BRANCH - (MULTIPLE)

Head Office : Shraddha, 3rd Floor, Near Chinai College, Andheri (E), Mumbai – 69.

Tel : (022) 26836666

Answer-1 (a) :

1. Desired Profit from production and sale of Product M = Rs. 16,00,000 x 10%= Rs.1,60,000

(1 Mark)

2. Statement showing Cost, Markup and Sale Price under different Cost Concepts

Particulars	Total Cost Concept	Prodn Cost Concept	Variable Cost Concept
Material + Labour + FOH (Variable)	80,000 units × ₹ 20 = ₹ 16,00,000	80,000 units × ₹ 20 = ₹ 16,00,000	80,000 units × ₹ 20 = ₹ 16,00,000
Variable Selling & Admin Expenses	80,000 units × ₹ 5 = ₹ 4,00,000	NA	80,000 units × ₹ 5 = ₹ 4,00,000
Fixed Factory OH	₹ 8,00,000	₹ 8,00,000	NA
Fixed Selling & Admin Expenses	₹ 4,00,000	NA	NA
Total Cost	**₹ 32,00,000**	**₹ 24,00,000**	**₹ 20,00,000**
Cost per unit	$\frac{₹\ 32,00,000}{80,000\ units}$ = **₹ 40.00**	$\frac{₹\ 24,00,000}{80,000\ units}$ = **₹ 30.00**	Given = **₹ 25.00**
Formula for Markup %, to earn Desired Profit ₹ 1,60,000 **(WN 1)**	$\frac{Desired\ Profit}{Total\ Costs}$	$\frac{Desired\ Profit + S\ \&\ AOH}{Total\ Mfring\ Costs}$	$\frac{Desired\ Profit + Fixed\ Costs}{Total\ Variable\ Costs}$
Markup % =	= $\frac{₹\ 1,60,000}{₹\ 32,00,000}$ = **5%**	$\frac{₹\ 9,60,000}{₹\ 24,00,000}$ = **40%**	$\frac{₹\ 13,60,000}{₹\ 20,00,000}$ = **68%**
Selling Price	₹ 40 + 5% = **₹ 42.00**	₹ 30 + 40%= **₹ 42.00**	₹ 25 + 68%= **₹ 42.00**

(4 Marks)

3. Proposal to sell to XYZ Ltd

Differential Revenue from the offer = Revenue from Sale of 4,000 additional units at Rs. 28	Rs.1,12,000
Less: Differential Cost of the offer = Variable Production Costs of 4,000 additional units at Rs. 20	Rs.80,000
Differential Income from accepting offer	**Rs. 32,000**

Conclusion: The proposal should be accepted.

(1 Mark)

Answer-1 (b) :

Step 1

Subtract the smallest element of each row from every element of the corresponding row.

	I	II	III	IV
1	0	36	18	6
2	18	48	0	44
3	46	8	6	0
4	18	32	28	0

Step 2

Subtract the smallest element of each column from every element in that column.

	I	II	III	IV
1	0	28	18	6
2	18	40	0	44
3	46	0	6	0
4	18	24	28	0

Step 3

Drew minimum number of horizontal and vertical lines to cover all the zeros

	I	II	III	IV
1	0	28	18	6
2	18	40	0	44
3	46	0	6	0
4	18	24	28	0

Since, No. of lines are equal to order of matrix, hence, solution is optimal.

1	I	16 hrs.
2	III	8 hrs.
3	II	38 hrs.
4	IV	20 hrs.
	Total	82 hrs.

Minimum time taken is 82 hrs.

(5 Marks)

Answer-1 (c) :

Ranking of Products When Availability of Time is the Key Factor

Products	**A**	**B**	**C**	**D**
Market Price (Rs.)	150	146	140	130
Less: Variable Cost (Rs.)	130	100	90	85
Contribution per unit (Rs.)	20	46	50	45
Labour Hours per unit 3 hrs. 4 hrs. 2 hrs. 3 hrs.				
Contribution per Labour Hour	6.67	11.50	25.00	15.00
Ranking	IV	III	I	II
Maximum Demand (units)	2,800	2,500	2,300	1,600
Total No. of Hours	8,400	10,000	4,600	4,800
Allocation of 20,000 Hours on the Basis of Ranking	600*	10,000	4,600	4,800

(*) Balancing Figure

Note

Time required to meeting the demand of 2,500 units of Product D for Division Y is 7,500 hrs. This requirement of time viz. 7,500 hrs for providing 2,500 units of Product D for Division Y can be met by sacrificing 600 hours of Product A (200 units) and 6,900 hours of Product B(1,725 units).

Transfer Price = Variable Cost + Opportunity Cost

$$= \text{Rs.}85 + \frac{(6{,}900 \text{ hrs.} \times \text{Rs.}11.5 + 600 \text{ hrs.} \times \text{Rs.}6.66)}{2{,}500 \text{ units}}$$

$$= \text{Rs.}85 + \frac{\text{Rs.}79{,}350 + \text{Rs.}4{,}000}{2{,}500 \text{ units}}$$

$$= \text{Rs.}85 + \text{Rs.}33.34$$

$$= \text{Rs.}118.34$$

(5 Marks)

Answer-1 (d) :

(i) Cost Indifference Point

	A and B (Rs.)	**A and C (Rs.)**	**B and C (Rs.)**

Differential Fixed Cost	...(I)	Rs.30,000 (Rs.45,000 – Rs.15,000)	Rs.1,10,000 (Rs.1,25,000 – Rs.15,000)	Rs.80,000 (Rs.1,25,000 – Rs.45,000)
Differential Variable Costs	...(II)	Rs.100 (Rs.240 –Rs.140)	Rs.200 (Rs.240 – Rs.40)	Rs.100 (Rs.140 – Rs.40)
Cost Indifference Point (Differential Fixed Cost / Differential Variable Costs per case)	...(I/II)	300 Cases	550 Cases	800 Cases

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Interpretation of Results

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

No. of Cases	Alternative to be Chosen
Cases $\leq$ 300	Alternative 'A'
300 $\geq$ Cases $\leq$ 800	Alternative 'B'
Cases $\geq$ 800	Alternative 'C'

(ii) Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go upto 850 cases, alternative C is most appropriate.

(4 Marks)

Answer-2 (a) :

1. Analysis of Semi-Variable OH into Fixed and Variable Elements

Particulars	Variable Element	Fixed Element (based on 50% level)
(a) Production OH	$\frac{₹\ 6,50,000 - ₹\ 6,00,000}{(12,000 - 10,000)\ units}$ = **₹ 25 p.u.**	₹ 6,00,000 – (10,000 units × ₹ 25) = ₹ 3,50,000
(b) Selling OH	$\frac{₹\ 2,40,000 - ₹\ 2,20,000}{(12,000 - 10,000)\ units}$ = **₹ 10 p.u.**	₹ 2,20,000 – (10,000 units × ₹ 10) = ₹ 1,20,000

(2 Marks)

2. Flexible Budget for next year (Rs.)

Particulars		Cost at 60%	Revised at 60%	75%	90%
Sale Quantity		**12,000 units**	**12,000 units**	**15,000 units**	**18,000 units**
Materials		Given = 1,20,000	1,20,000 + 5% = 1,26,000	$1,26,000 \times \frac{75\%}{60\%}$ = 1,57,500	$1,26,000 \times \frac{90\%}{60\%}$ = 1,89,000
Labour		Given = 1,92,000	See Note below = 2,06,000	$2,06,000 \times \frac{75\%}{60\%}$ = 2,57,500	$2,06,000 \times \frac{90\%}{60\%}$ = 3,09,000
POH	Variable	Given = 3,00,000	3,00,000 + 6% = 3,18,000	$3,18,000 \times \frac{75\%}{60\%}$ = 3,97,500	$3,18,000 \times \frac{90\%}{60\%}$ = 4,77,000
	Fixed	Given = 3,50,000	3,50,000 + 10% = 3,85,000	3,50,000 + 10% = 3,85,000	3,50,000 + 22% = 4,27,000
AOH	Fixed	Given = 1,20,000	1,20,000 + 15% = 1,38,000	1,20,000 + 15% = 1,38,000	1,20,000 + 15% = 1,38,000
SOH	Variable	Given = 1,20,000	1,20,000 + 10,% = 1,32,000	$1,32,000 \times \frac{75\%}{60\%}$ =1,65,000	$1,32,000 \times \frac{90\%}{60\%}$ = 1,98,000
	Fixed	Given = 1,20,000	1,20,000 + 8% = 1,29,600	1,20,000 + 8% = 1,29,600	1,20,000 + 8% = 1,29,600
Total Costs				**16,30,100**	**18,67,600**
Cost per unit				**108.67**	**103.75**

(4 Marks)

Note : Revised Labour Cost at 60% capacity = Rs.1,92,000 x $\frac{103\%\ (\text{for rate increase})}{96\%\ (\text{for efficiency fall})}$ = Rs.2,06,000

3.Computation of Sales Value at 75% Capacity

(a) Cost at 75% Capacity Level (WN 2)	Rs. 16,30,100
(b) Profit = 20% on Sales = l/5th on Sales = 1A on Cost of X 16,30,100	Rs. 4,07,525

(c) Sales Value at 75% Capacity Level (a + b) Rs. 20,37,625

(1 Mark)

4. Evaluation of Export Offer

(a) Incremental Revenue from 3,000 units Export Offer, at X 92 per unit Rs.2,76,000

(b) Incremental Costs of 3,000 units, i.e. 75% to 90% Capacity = (X 18,67,600 - X 16,30,100) Rs.2,37,500

(c) Incremental Profit from Export Offer (a - b) Rs. 38,500

Conclusion: The Export Offer may be accepted, as there is additional profit of Rs.38,500

(1 Mark)

Answer-2 (b) :

We shall prepare the simplex table as follows :

SIMPLEX TABLEAU-I

$C_j \rightarrow$			40	60	0	0	0	Min. Ratio
C_B	Basic Variable (B)	Value of Basic Variables b(=X_B)	x_1	x_2	s_1	s_2	s_3	
0	s_1	36	3	3	1	0	0	12
0	s_2	60	5	2	0	1	0	30
0	s_3	60	2	**6**	0	0	1	←10
		$Z_j - \sum C_{Bi}X_j$	0	0	0	0	0	
		$C_j - Z_j$	40	60↑	0	0	0	

2 Marks

SIMPLEX TABLEAU-II

$C_j \rightarrow$			40	60	0	0	0	Min. Ratio
C_B	Basic Variable (B)	Value of Basic Variables b(=X_B)	x_1	x_2	s_1	s_2	s_3	
0	s_1	6	**2**	0	1	0	$-\frac{1}{2}$	←3
0	s_2	40	$\frac{13}{3}$	0	0	1	$-\frac{1}{3}$	$\frac{120}{13}$
60	x_2	10	$\frac{1}{3}$	1	0	0	$\frac{1}{6}$	30
		$Z_j - \sum C_{Bi}X_j$	20	60	0	0	10	
		$C_j - Z_j$	20↑	0	0	0	−10	

SIMPLEX TABLEAU-III

3 Marks

$C_j \rightarrow$			40	60	0	0	0
C_B	Basic Variable (B)	Value of Basic Variables b(=X_B)	x_1	x_2	s_1	s_2	s_3
40	x_1	3	1	0	$\frac{1}{2}$	0	$-\frac{1}{4}$
0	s_2	27	0	0	$-\frac{13}{6}$	1	$\frac{3}{4}$
60	x_2	9	0	1	$-\frac{1}{6}$	0	$\frac{1}{4}$
		$Z_j - \sum C_{Bi}X_j$	40	60	10	0	5
		$C_j - Z_j$	0	0	−10	0	− 5

3 Marks

Since all $C_j - Z_j$ are negative or zero, this is the optimum solution with, $x_1 = 3$ & $x_2 = 9$ and optimum Z = Rs.660.

Answer-3 (a) :

(i) Profit for First / Second Year on Monthly and Yearly Basis

(Amount in '000)

	First Year		Second Year	
	Monthly (₹)	Yearly (₹)	Monthly (₹)	Yearly (₹)
Sales Revenue	600 {3,000 units × ($4 × ₹ 50)}	7,200	600	7,200
Material	180 (3,000 units × ₹ 60)	2,160	180	2,160
Labour	75 (3,000 units × ₹ 25)	900	75	900
Variable Overheads	60 (3,000 units × ₹ 20)	720	60	720
Primary Packing	45 (3,000units × ₹15)	540	45	540
Boxes Cost	24 $\left(\frac{3,000 \text{ units}}{50 \text{ units}} \times ₹400\right)$	288	24	288
Total Fixed Overheads (W.N.-1)	108 $\left(\frac{₹ 1,296}{12 \text{ months}}\right)$	1,296	110 $\left(\frac{₹1,320}{12 \text{ Months}}\right)$	1,320
Profit	108	1,296	106	1,272

(4 Marks)

(ii) Monthly Break-Even Units for the First Year

	Levels No. of Units (See W.N.-2)			
	1,351-1,400 (Rs.)	**1,401-1,450 (Rs.)**	**1,451-1,500 (Rs.)**	**1,501-1,505 (Rs.)**
Fixed Costs:				
Total Fixed Overheads per month	1,08,000	1,08,000	1,08,000	1,08,000
Semi-Variable Costs :				
(Special Boxes Cost) (W.N.-2)	11,200 (28 Boxes × Rs.400)	11,600 (29 Boxes × Rs.400)	12,000 (30 Boxes × Rs.400)	12,400 (31 Boxes × Rs.400)
Total Fixed and Semi VariableCosts	1,19,200	1,19,600	1,20,000	1,20,400
Break-even Level (in units)*	1,490 (Rs.1,19,200 / Rs. 80)	1,495 (Rs.1,19,600 / Rs. 80)	1,500 (Rs.1,20,000/ Rs. 80)	1,505 (Rs.1,20,400/ Rs.80)

(2 Marks)

* $\left(\frac{\text{Total Fixed and Semi-Variable Cost}}{\text{Contribution per unit}}\right)$

(1 Mark)

The above statement shows that the first and second break-even level of units, viz., 1,490 and 1,495 units falls outside the range of 1,351 -1,400 and 1,401 -1,450 units respectively. In the present case a monthly break-even level of units is 1,500 units which lies in the range of 1,451-1,500 units.

Yearly Break-Even Units for the First Year

	Levels No. of Units (See W.N.-3)			
	17,851-17,900 (Rs.)	**17,901-17,950 (Rs.)**	**17,951-18,000 (Rs.)**	**18,001-18,050 (Rs.)**
Fixed Costs	12,96,000	12,96,000	12,96,000	12,96,000
Semi-Variable Costs (Special Boxes Cost)	1,43,200 (358 Boxes × Rs.400)	1,43,600 (359 Boxes × Rs. 400)	1,44,000 (360 Boxes × Rs. 400)	1,44,400 (361 Boxes × Rs.400)
Total Fixed and Semi VariableCosts	14,39,200	14,39,600	14,40,000	14,40,400
Break-even Level (in units)	17,990 (Rs.14,39,200 / Rs.80)	17,995 (Rs.14,39,600 / Rs.80)	18,000 (Rs.14,40,000 / Rs.80)	18,005 (Rs.14,40,400 /Rs.80)

(2 Marks)

The above table shows that yearly break-even of units is 18,000 units which lies in the range of 17,951-18,000 units. The other first two figures do not lie in the respect ranges. Hence, they are not acceptable.

(iii) In case the number of toys goes beyond the level of 1,500, one more box will be required to accommodate each 50 additional units of toys. In such a case the additional cost of a box will be Rs. 400. This amount can be recovered by the additional contribution of 5 toys. Thus, the second break-even point in such a contingency is 1,505 toys.

In case the number of toys goes beyond the level of 18,000 number, one more box will be required. The additional cost of this box will be Rs. 400; which can be recovered by the additional contribution of 5 toys. Thus, the second break-even point is 18,005 toys.

(iv) Yearly break-even point of 18,000 units of toys in the first year is equal to 12 times the monthly break-even point of 1,500 units. Thus, both the monthly and yearly figures of break-even point fall on the upper limit of their respective range.

In the second case, it is not so because the monthly and yearly break-even point fall within the range of 50 toys.

(1 Mark)

Working Notes

(1)

Fixed Overheads	**1st Year**	**2nd Year**
Depreciation $\left\{\frac{\text{Rs.24,00,000 + Rs.2,88,000 (Duty)}}{\text{3 Years}}\right\}$	Rs. 8,96,000	Rs. 8,96,000
Other Fixed Overheads	Rs.4,00,000	Rs.4,24,000
Total Fixed Overheads	Rs.12,96,000	Rs.13,20,000

(2)

Fixed Overhead in the first year	Rs.12,96,000
Fixed Overhead per month	Rs.1,08,000
Contribution per unit (Rs. 200 - Rs. 120)	Rs.80

Hence the Break-even Number of Units will be above 1,350 units $\left(\frac{\text{Rs.1,08,000}}{\text{Rs.80}}\right)$

(3)

Fixed Overhead in the first year	Rs.12,96,000
Contribution per unit (Rs.200 – Rs.120)	Rs.80

Hence the Break-even Number of Units to recover fixed cost will be above 16,200 units $\left(\frac{\text{Rs.12,96,000}}{Rs.80}\right)$

But, at this Break -even Point another Fixed Cost will be incurred on Boxes.

Number of Boxes Required $\left(\frac{16,200 \text{ units}}{50 \text{ units}}\right)$	324 units
Cost of Boxes (324units × Rs.400)	Rs.1,29,600
Now the Total Fixed Cost (Rs.12,96,000 + Rs.1,29,600)	Rs.14,25,600
Therefore, the new Break-even Point $\left(\frac{Rs.14,25,600}{Rs.80}\right)$	17,820 units

(2 Marks)

Answer-3 (b) :

Contribution per tin = Selling Price – Variable cost
= Rs.21 – (Rs.7.8 + Rs.2.1+ Rs.2.5 + Rs.0.6)
= Rs.8 per tin

Loss on Operation

Fixed Cost per annum = 8 lakhs (2,00,000 units × 4 per unit)
Fixed Cost for 1 Quarter = 2 lakhs (8 lakhs / 4)

(2 Marks)

	(Rs.)
Fixed Cost for the quarter	2,00,000
Less: Contribution on operation (Rs.8 × 10,000 units)	80,000
Expected Loss on operation	(1,20,000)

(2 Marks)

Loss on Shut Down	**(Rs.)**
Unavoidable Fixed Cost	74,000
Additional Shut Down Cost	14,000
Loss on Shut Down	(88,000)

(2 Marks)

Conclusion

Better to Shut Down and Save Rs.32,000.

Shut Down Point (number of units) = $\frac{\text{Avoidable Fixed Cost}}{\text{Contribution per unit}}$

= $\frac{Rs.2,00,000 - Rs.88,000}{Rs.8}$

= 14,000 units

(2 Marks)

Answer-4 (a) :

Working Notes

	Particulars		**P**	**Q**
(a)	Production / Sales Quantity (units)		1,00,000	50,000
(b)	Batch Size (units)		1,000	500
(c)	No. of Batches	…(a ÷ b)	100	100
(d)	Setup Time per Batch (hours)		30	36
(e)	Total Setup Hours (hours)	…(c × d)	3,000	3,600
(f)	Machine Setup Cost Rs. 4,62,000			
(g)	Cost Driver per Machine Setup Hour = $\frac{Rs.4,62,000}{6,600 \text{ hours}}$=Rs.70			
(h)	Testing Time per Unit (hours)		5	9
(i)	Total Testing Time (hours)	…(a × h)	5,00,000	4,50,000
(j)	Testing Cost Rs.23,75,000			
(k)	Cost Driver per Testing Hour = $\frac{Rs.23,75,000}{9,50,000 \text{ hours}}$ = Rs.2.50			

(2 Marks)

(i) Statement Showing "Cost per unit- Activity Based Costing"

Particulars of Costs	Basis	P	Q
Direct Material	Direct	42,00,000	30,00,000
Direct Labour	Direct	15,00,000	10,00,000
Direct Machine Cost	Direct	7,00,000	5,50,000
Machine Setup Cost	3,000 hrs. @ Rs.70	2,10,000	—
	3,600 hrs. @ Rs.70	—	2,52,000
Testing Cost	5,00,000 hrs. @ Rs.2.50	12,50,000	—
	4,50,000 hrs. @ Rs.2.50	—	11,25,000
Engineering Cost	Allocated	8,40,000	14,10,000
Total Cost (Rs.)		87,00,000	73,37,000
Cost per unit (Rs.)		87.00	146.74

(2 Mark)

(ii) Statement Showing "Mark-up (full cost basis)- Product P"

Particulars	Per unit
Selling Price	100.05
Less: Full Cost	87.00
Markup	13.05
Percentage of Markup on Full Cost $\left(\frac{13.05}{87.00} \times 100\right)$	15%

(1 Mark)

(iii)Statement Showing "Target Cost of Product P"
(After New Design is Implemented)

Particulars	(Rs.)
Target Price (given)	86.25
Mark-up $\left[\frac{86.25}{115.00} \times 15\right]$	11.25
Target Cost per unit	75.00

(1 Mark)

(iv) Statement Showing "Cost of P (New Design)"

Particulars of Costs	Basis of Costs	Rate	Total Cost
Direct Material	Decrease by Rs. 5 p.u.	37.00	37,00,000
Direct Labour	Decrease by Rs. 2 p.u.	13.00	13,00,000
Direct Machining Cost	No Change as Machine is Dedicated	7.00	7,00,000
Machine Setup Cost	100 Setup × 28 hrs. × Rs. 70	1.96	1,96,000
Testing Cost	1,00,000 units × Rs. 2.50 × 4 hrs.	10.00	10,00,000
Engineering	Cost No Change	8.40	8,40,000
Total Cost		77.36	77,36,000

(1 Mark)

* Rate per unit

The target cost is Rs. 75 p.u. and estimated cost (new design) is Rs. 77.36 p.u. The new design does not achieve the target cost set by NEC Ltd. Hence the target mark up shall not be achieved.

(v) Possible Management Action

— Value engineering and value analysis to reduce the direct material costs.
— Time and motion study in order to redefine the direct labour time and related costs.
— Exploring possibility of cost reduction in direct machining cost by using appropriate techniques.

— Identification of non-value added activities and eliminating them in order to reduce overheads.

— The expected selling price based on estimated cost of Rs. 77.36 per unit is (Rs.77.36 +15%) Rs. 88.96. Introduce sensitivity analysis after implementation of new design to study the sales quantity changes in the price range of Rs. 86.25 to Rs.88.96.

(1 Mark)

Answer-4 (b) :

Analysis of Range of Negotiation for Manager of Division X

(Figures in Rs.)

Division X

	Outside Sales	Sales to Y (Range)
Selling Price	110	70 - 79*
Less: Commission	15	-- - --
Net Selling Price	95	70 - 79
Less: Variable Cost	70	70 - 70
Contribution *per unit*	25	0 - 9
Units	14,000	6,000 - 6,000
Total Contribution (Units × Contribution *per unit*)	3,50,000	0 - 54,000

(*) External Rate – Transport Expense

(3 Marks)

Analysis of Range of Negotiation for Manager of Division Y

(Figures in Rs.)

Division Y

	Outside Sales			Sale to Div. Z		
	From Division X		From Outside	From Division X		From Outside
Price Range	70	79	85	70	79	85
Add: Transport	6	6	---	6	6	---
Total	76	85	85	76	85	85
Add: Direct Labour	50	50	50	50	50	50
Total	126	135	135	126	135	135
Add: Delivery Cost	10	10	10	8	8	8
Total	136	145	145	134	143	143
Add: Sales Commission	15	15	15	---	---	---
Total Cost ...(B)	151	160	160	134	143	143
Selling Price ...(A)	170	170	170	135	135	135
Contribution ...(A)-(B)	19	10	10	1	(8)	(8)

(3 Marks)

Range of Negotiations

Manager of Division X will sell 14,000 units outside at Rs.110 per unit and earn contribution of Rs.3.50 lakhs. Excess capacity of 6,000 units can be offered to Division Y at a price between Rs.70 (variable manufacturing cost to Division X) and Rs.95 (maximum amount to equal outside contribution). But Division Y can get the

material outside at Rs.85. So, Division Y will not pay to Division X anything above Rs.79 (Rs.85 – Rs.6) to match external available price.

Division X will be attracted to sell to Division Y only in the range of Rs.71 – Rs.79 per unit at a volume of 6,000 units. At Rs.70, Division X will be indifferent, but may offer to sell to Division Y to use idle capacity.

Division Z will not buy from Division Y at anything above Rs.135. If Division X sells to Division Y at 70 per unit, Division Y can sell to Division Z at Rs.134 and earn no contribution, only for surplus capacity and if units transferred by Division X to Division Y at Rs.70 per unit.

	Division Y	**Division Z**
Provided Division X sells to Division Y at Rs.70 per unit	Sell 4,000 units to Division Z at Rs.134 (Indifferent) Sell 4,000 units to Division Z at Rs.135 (Willingly for a contribution of Rs.1)	Buy 4,000 units from Division Y at Rs.134 (attracted) Indifferent, since market price is also Rs.135

For buying from X at Rs.71 – Rs.79 price range, Y will be interested in selling to Z only at prices Rs.136 – Rs.143, which will not interest Z.
Thus Y will sell to Z only if X sells to Y at Rs.70 per unit and Y will supply to Z maximum 4,000units.

(2 Marks)

Answer-5 (a) :

Income Statement

Particulars	**Option I**	**Option II**	**Option III**
1. Life Cycle Sales Quantity	5,000 units	4,000 units	2,500 units
2. Life Cycle Selling Price p.u.	₹ 400	₹ 480	₹ 600
3. Life Cycle Sales Revenue (1×2)	**₹ 20,00,000**	**₹ 19,20,000**	**₹ 15,00,000**
4. Life Cycle Functional Costs			
(a) Research and Development	₹ 2,40,000	₹ 2,40,000	₹ 2,40,000
(b) Design	₹ 1,60,000	₹ 1,60,000	₹ 1,60,000
(c) Production One Time	₹ 1,00,000	₹ 1,00,000	₹ 1,00,000
Variable	5000 × ₹ 25 = ₹ 1,25,000	4000 × ₹ 25 = ₹ 1,00,000	2500 × ₹ 25 = ₹ 62,500
(d) Marketing One Time	₹ 70,000	₹ 70,000	₹ 70,000
Variable	5000 × ₹ 24 = ₹ 1,20,000	4000 × ₹ 24 = ₹ 96,000	2500 × ₹ 24 = ₹ 60,000
(e) Distribution One Time	₹ 50,000	₹ 50,000	₹ 50,000
Variable	5000 × ₹ 16 = ₹ 80,000	4000 × ₹ 16 = ₹ 64,000	2500 × ₹ 16 = ₹ 40,000
(f) Customer Service One Time	₹ 80,000	₹ 80,000	₹ 80,000
Variable	5000 × ₹ 30 = ₹ 1,50,000	4000 × ₹ 30 = ₹ 1,20,000	2500 × ₹ 30 = ₹ 75,000
Life Cycle Total Costs	₹ 11,75,000	₹ 10,80,000	₹ 9,37,500
5. **Life Cycle Net Income**	**₹ 8,25,000**	**₹ 8,40,000**	**₹ 5,62,500**

(8 Marks)

Conclusion: The Company may select Price of Rs. 480 to maximize Profits. Assumed that R & D Costs and Design Costs represent Total Costs incurred in 2 Years.

Answer-5 (b) :

Allocation of Random Numbers

Demand (units)

Units	**Probability**	**Cumulative Probability**	**Random Nos.**
10,000	0.20	0.20	00 – 19
20,000	0.25	0.45	20 – 44
30,000	0.30	0.75	45 – 74
40,000	0.25	1.00	75 - 99

(1 Mark)

Contribution per unit

Rs.	Probability	Cumulative Probability	Random Nos.
25	0.25	0.25	00 – 24
35	0.30	0.55	25 – 54
45	0.35	0.90	55 – 89
55	0.10	1.00	90 - 99

(1 Mark)

Advertising Cost

Rs.	Probability	Cumulative Probability	Random Nos.
50,000	0.22	0.22	00 – 21
60,000	0.33	0.55	22 – 54
70,000	0.44	0.99	55 – 98
80,000	0.01	1.00	99 - 99

(1 Mark)

Investment

Rs.	Probability	Cumulative Probability	Random Nos.
50,00,000	0.10	0.10	00 – 09
55,00,000	0.30	0.40	10 – 39
60,00,000	0.45	0.85	40 – 84
65,00,000	0.15	1.00	85 – 99

(1 Mark)

Simulation Table

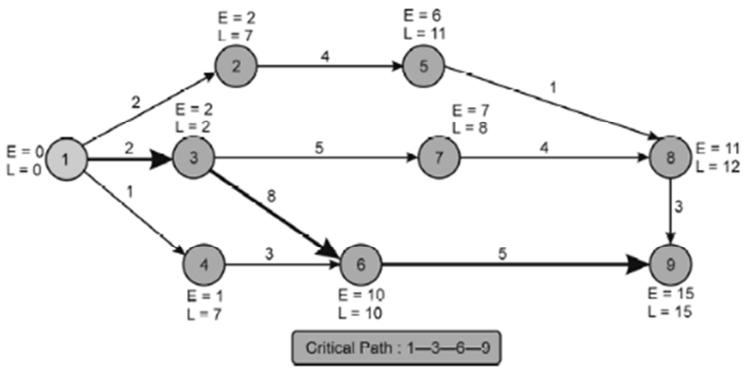
Random Number	Demand Units	Contribution Per unit Rs.	Adv. Cost Rs.	Return Rs.	Investment Rs.	Return on Investment
09, 24, 85, 07	10,000	25	70,000	1,80,000	50,00,000	3.60%
84, 38, 16, 48	40,000	35	50,000	13,50,000	60,00,000	22.50%
41, 73, 54, 57	20,000	45	60,000	8,40,000	60,00,000	14.00%
92, 07, 99, 64	40,000	25	80,000	9,20,000	60,00,000	15.33%
65, 04, 78, 72	30,000	25	70,000	6,80,000	60,00,000	11.33%

Highest Likely Return is 22.50% relating to trial 2.

(4 Marks)

Answer-6 (a) :

(i) The **Arrow Diagram** for the given data is drawn below:



(2 Marks)

(ii) The **Critical Path** is 1–3–6–9.
Total Project Duration is 15 weeks.

(1 Mark)

(iii) The Total, Free and Independent Floats are computed in the following table:

Activity	Duration	EST	EFT	LST	LFT	Slack of Tail Event	Slack of Head Event	Total Float	Free Float	Ind. Float
	D_{ij}	E_i	$E_i + D_{ij}$	$L_j - D_{ij}$	L_j	$L_i - E_i$	$L_j - E_j$	LST – EST	Total Float – Slack of Head Event	Free Float – Slack of Tail Event
1–2	2	0	2	5	7	0	5	5	0	0
1–3	2	0	2	0	2	0	0	0	0	0
1–4	1	0	1	6	7	0	6	6	0	0
2–5	4	2	6	7	11	5	5	5	0	0*
3–6	8	2	10	2	10	0	0	0	0	0
3–7	5	2	7	3	8	0	1	1	0	0
4–6	3	1	4	7	10	6	0	6	6	0
5–8	1	6	7	11	12	5	1	5	4	0*
6–9	5	10	15	10	15	0	0	0	0	0
7–8	4	7	11	8	12	1	1	1	0	0*
8–9	3	11	14	12	15	1	0	1	1	0

(*) Being negative, the independent float is taken to be equal to zero.

(5 Marks)

Answer-6 (b) :

COMPARISON BETWEEN STANDARD AND ACTUAL

Trading and Profit and Loss Account
for 4 weeks ended 31st March, 2013

Particulars	Std. 3,500 units	Actual 3,500 units	Variance	Particulars	Std. 3,500 units	Actual 3,500 units	Variance
	₹	₹	₹		₹	₹	₹
Material	1,75,000	1,89,000	14,000(A)	Transfer to Sales Dept. at ₹140 each	4,90,000	4,90,000	-
Direct Wages	21,000	22,100	1,100(A)				
Variable Exp.	70,000	62,000	8,000(F)				
Fixed Exp.	1,40,000	1,88,000	48,000(A)				
Profit	84,000	28,900	55,100(A)				
	4,90,000	4,90,000			4,90,000	4,90,000	

(2 Marks)

COMPUTATION OF VARIANCES

1. Direct Material Variances

Material Price Variance = Actual Quantity × (Standard Price – Actual Price)

		= 3,600 units × (Rs. 50.00 – Rs. 52.50)
		= Rs. 9,000 (A)
	Material Usage Variance	= Standard Price × (Standard Quantity – Actual Quantity)
		= Rs. 50 × (3,500 units – 3,600 units)
		= Rs. 5,000 (A)
	Material Cost Variance	= Rs. 9,000 (A) + Rs. 5,000 (A)
		= Rs.14,000 (A)
2.	**Direct Labour Cost Variance**	
	Labour Rate Variance	= Actual Hours × (Standard Rate – Actual Rate)
		= 6,800 hours × (Rs. 3.00 – Rs. 3.25)
		= Rs. 1,700 (A)
	Labour Efficiency Variance	= Standard Rate × (Standard Hours – Actual Hours)
		= Rs. 3 × (3,500 units × 2 hours – 6,400 hours)
		= Rs. 1,800 (F)
	Idle Time Variance	= Standard Rate × Idle Hours
		= Rs. 3 × 400
		= Rs. 1,200 (A)
	Labour Cost Variance	= Rs. 1,700 (A) + Rs. 1,800 (F) + Rs. 1,200 (A)
		= Rs. 1,100 (A)
3.	**Variable Expense Variance**	
		= Standard Variable Expenses – Actual Variable Expenses
		= 3,500 units × Rs. 20 – Rs. 62,000
		= Rs. 8,000 (F)
4.	**Fixed Expenses Variances**	
	Expenditure Variance	= Budgeted Fixed Expenses – Actual Fixed Expenses
		= 4,800 units × Rs. 40 – Rs. 1,88,000
		= Rs. 4,000 (F)
	Volume Variance	= Absorbed Fixed Expenses – Budgeted Fixed Expenses
		= Rs. 40 × 3,500 units – Rs. 40 × 4,800 units
		= Rs. 52,000 (A)
	Capacity Variance	= Std. Rate per hour × (Actual Hours – Budgeted Hours)
		= Rs. 20 × (6,400 hours – 9,600 hours)
		= Rs. 64,000 (A)
	Efficiency Variance	= Std. Rate per hour × (Std. Hours for Actual Output – Actual Hours)
		= Rs. 20 × (7,000 hours – 6,400 hours)
		= Rs. 12,000 (F)
	Fixed Expense Variance (Total)	= Rs. 4,000 (F) + Rs. 64,000 (A) + Rs. 12,000 (F) = Rs. 48,000 (A)
5.	**Total Cost Variance**	= Direct Material Cost Variance + Direct Labour Cost Variance + Variable Expenses Variance + Fixed Expenses Variance
		= Rs. 14,000 (A) +1,100 (A) + Rs. 8,000 (F) + Rs. 48,000 (A)
		= Rs. 55,100 (A)
6.	**Profit Variance**	= Standard Profit – Actual Profit
		= Rs. 84,000 – Rs. 28,900
		= Rs. 55,100 (A)

(6 x 1 = 6 Marks)

Answer-7 (a) :

1. Statement of Operating Costs per annum

Particulars	**Rs.**
Rent (Fixed Element) at Rs. 10,000 for 12 months	1,20,000
Hire Charges of Additional beds	12,000
Fees paid to Heart Specialist (Rs. 15,000 x 3 trips)	45,000

Salary of Supervisors, Nurses, Ward Boys	4,25,000
Repairs and Maintenance	90,000
Salary of Doctors	13,50,000
Food supplied to Patients	40,000
Laundry Charges for their bed linens	80,500
Medicines Supplied	74,000
Cost of Oxygen, X-Ray, etc. other than directly borne for treatment of patients	49,500
General Administration Charges	63,000
Total Costs as above	**23,49,000**

(3 Marks)

2. Computation of Desired Rent Collections

	Particulars	%	₹
	Gross Rent Collections (including Service Tax of 8%)	108%	**33,82,560**
Less:	Service Tax at 8% of Rent Collections	8%	2,50,560
	Rent Collections **(taken as base = 100%)**	100%	23,49,000 ÷ 75% = 31,32,000
Less:	Desired Profit Margin (on Revenue excluding Service Tax)	20%	6,26,400
	Balance being Total Operating Costs	80%	25,05,600
Less:	Variable Rent Share (on Revenue excluding Service Tax)	5%	1,56,600
	Net Balance Operating Costs (amount as per **WN 1**)	75%	(as per **WN 1**) = **23,49,000**

(2 Marks)

Note: Figures in Amount Column are derived by pro-rata calculation, based on Net Operating Costs as 75%

3. Computation of Rent per Bed-Day

Ward	General	Cottage	Deluxe	Total
(a) Number of Beds	100	50	30	
(b) Occupancy	100%	80%	60%	
(c) Number of days in a year	360	360	360	
(d) Effective Bed–Days p.a. (a × b × c) (See Note)	36,600	14,400	6,480	57,480
(e) Rent per Bed–Day Ratio	1 time	2.5 times	5 times	
(f) **Total Bed Days for Rent Purposes** (d × e)	**36,600**	**36,000**	**32,400**	**1,05,000**
(g) Rent Collection apportioned in ratio of (f)	10,91,726	10,73,828	9,66,446	31,32,000
(h) Rent per bed–day (g ÷ d) (excluding ST 8%)	**₹29.83**	**₹74.57**	**₹149.14**	

(3 Marks)

Note: In General Ward, Total Bed Days = 100 x 100% x 360 = 36,000 days only. However, Additional Bed Charges =Rs. 12,000 at Rs. 20 per bed (given). Hence extra bed-days = Rs. 12,000 ÷Rs. 20 = 600. This has also been included in the Column above, in Row (d).

Answer-7 (b) :

1. Computation of Differential Cost of the New Job

Particulars	Increase in Cost	Decrease in Cost
(a)Material Cost	5,000 units x Rs.10 = Rs.50,000	50% of A Rs.40,000 = Rs.20,000
(b)Labour Cost	5,000 units x Rs.18 = Rs.90,000	50% of A Rs.45,000 = Rs.22,500
(c)Other Expenses Cost	Nil	50% of A Rs.4,500 = Rs.2,250
(d)Specific Overheads	Given = Rs.10,000	Nil
Total	**Rs. 1,50,000**	**Rs. 44,750**

(2 Marks)

Hence, Net Differential Cost of the New Job = Rs. 1,50,000 –Rs. 44,750 = Rs. 1,05,250.

Note: Depreciation, Power, Rent, Heat and Light, will not change, and do not affect Differential Costs.

2. Computation of Full Cost of New Job

Particulars	Computation	Rs.

(a) Additional Material, Labour and OH	as per WN 1	1,50,000
(b) Depreciation	50% of Rs. 18,000	9,000
(c) Power	50% of Rs. 2,000	1,000
(d) Rent	50% of Rs. 5,000	2,500
(e) Heat and Light	50% of Rs. 500	250
Total		**1,62,750**

(2 Marks)

3. Computation of Opportunity Cost of New Job = Contribution Foregone on Product A

Particulars	**Computation**	**Rs.**
(a) Sale Revenue foregone on A	50% of Rs. 1,25,000	62,500
(b) Variable Costs relating to above sales	Material = 50% of Rs. 40,000 = Rs. 20,000 Labour = 50% of Rs. 45,000 = Rs. 22,500 Power = 50% of Rs. 2,000 = Rs. 1,000 Other Exps= 50% of Rs. 4,500 = Rs. 2,250	45,750
(c) Net Contribution Foregone	**= Opportunity Costs = (a - b)**	**16,750**

(2 Marks)

4. Computation of Sunk Cost of New Job

Sunk Cost = Depreciation + Power + Rent + Heat & Light = 9,000 + 1,000 + 2,500 + 250 = Rs. 12,750.

Note: Power may also be regarded as a Relevant Cost, and ignored in computing Sunk Costs above.

(1 Mark)

5. Evaluation of New Job

Particulars	**Rs.**
(a) Additional Revenue = Revenue from New Job less Revenue lost on Product A = (Rs. 25 p.u. x 5,000 units) - Rs. 62,500	62,500
(b) Additional Costs = Differential Costs as per WN 1	1,05,250
(c) Net Contribution lost / Cash Outflow / Disadvantage = (a - b)	**42,750**

Hence, the New Job should **not** be accepted.

(1 Mark)