FINAL CA – May 2018
ADVANCED MANAGEMENT ACCOUNTING

Test Code – F27
Branch: MULTIPLE Date: 07.01.2018

(50 Marks)

Note: All questions are compulsory.

Question 1

(a) (i) Statement Showing "Profitability of Product A & B"

Particulars	Product A 15,000 units (`)	Product B 15,000 units (`)
Contribution	6,00,000 (15,000 units × `40)	7,50,000 (15,000 units × `50)
Less: Setup Cost	32,000 (8 runs × `4,000)	90,000 (12 runs × `7,500)
Less: Distribution Cost	60,000 (500 boxes × `120)	24,000 (120 boxes × `200)
Less: Step Fixed Cost	32,000 (8 × `4,000)	75,000 (15 × `5,000)
Less: Un-analyzed Fixed Cost	32,000	32,000
Profit	4,44,000	5,29,000

(ii) Break Even Point "A" Un-analyzed Fixed Cost is ` 32,000

$$\text{Minimum units for BEP} = \frac{` 32,000}{` 40}$$

$$= 800 \text{ units}$$

Setup Cost (fixed for 2,000 units); 1 Production Run; ` 4,000/-

Step Cost (fixed for 2,000 units); ` 4,000/-

Distribution Cost will have to be recovered on the basis of 30 units.

Let BEP (units) - 'K'

$$40 \times K = ` 32,000 + ` 8,000 + \frac{K}{30 \text{ units}} \text{ Boxes} \times 120 ₹$$

$$K = 1,111.11 \text{ units}$$

Refining, 1,111.11 will have 37.03 boxes or say 38 boxes. The last box will cost 18. 120 which is equivalent to contribution from 3 units. Hence, BEP is 1,114 units.

Question 2

(i) The new formulation of the problem is as follows: (3 marks)

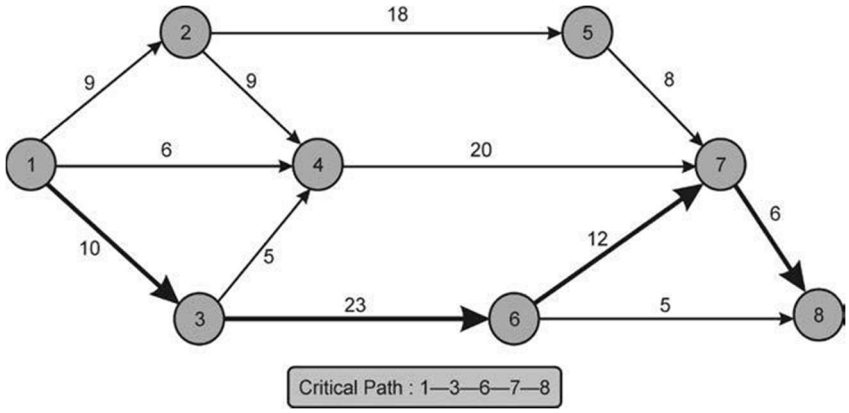
7. Activities 1–2, 1–3 and 14– completed in 9 Days, 10 Days and 6 Days respectively as per Original Schedule.
8. Activity 2–4 needs 9 Days (15 + 3 – 9) instead of Original Schedule of 7 Days.
9. Activity 3–6 needs 23 Days (15 + 18 – 10) instead of Original Schedule of 12 Days.

10. Activity 6–7 needs higher duration of 12 Days instead of Original Planned 7 Days.

11. Activity 6–8 needs lesser duration of 5 Days instead of Original Planned 7 Days.

- Activities 2–5, 3–4, 4–7, 5–7, 7–8 need 18 Days, 5 Days, 20 Days, 8 Days, 6 Days respectively as per Original Schedule.

The updated network based on the above listed activities will be as follows: (3 marks)



(ii) Various Paths with Duration of *updated network* are as follows: (2marks)

Path	Duration (Days)
1–2–5–7–8	41 (9 + 18 + 8 + 6)
1–2–4–7–8	44 (9 + 9 + 20 + 6)
1–4–7–8	32 (6 + 20 + 6)
1–3–4–7–8	41 (10 + 5 + 20 + 6)
1–3–6–7–8	51 (10 + 23 + 12 + 6)
1–3–6–8	38 (10 + 23 + 5)

Critical Path is 1–3–6–7–8 with Duration of 51 Days.

Question 3

Cumulative Average Time for 256 parts = 48.43 hrs.*
[112.50 × (0.90_8)]

Total Time for 256 parts = 12,398.08 hrs.
[48.43 hrs.× 256 parts]

Total Labour Cost of 256 parts = ` 2,47,961.60
[12,398.08 hrs.× ` 20]

Revised Labour Cost for *zero profit* = ` 3,22,961.60
[` 2,47,961.60 + ` 75,000]

Total Time for 256 parts (Revised) = 16,148.08 hrs.
[` 3,22,961.60/` 20]

Cumulative Average Time for 256 parts (Rev.) = 63.08 hrs.
[16,148.08/256]

The usual learning curve model is

$$y = ax^b$$

Where

y = Cumulative Average Time per part for x parts

a = Time required for first part

x = Cumulative number of parts

b = Learning coefficient ($\log r / \log 2$)

Accordingly

$$63.08 = 112.50 \times (256)^b$$

$$0.5607 = 2^{8b}$$

$$\log 0.5607 = \log 2^{8b}$$

$$\log 0.5607 = 8 \times b \times \log 2$$

$$\log 0.5607 = 8 \times \frac{\log r}{\log 2} \times \log 2$$

$$\log 0.5607 = 8 \log r$$

$$\log 0.5607 = \log r^8$$

$$0.5607 = r^8$$

$$r = \sqrt[8]{0.5607}$$

$$r = 0.9302$$

Learning Rate (r) = 93.02%.

Therefore

Sensitivity = 3.02/90

= 3.36%

Students may also take 48.38 hrs. (112.50 0.43)

Question 4

(i) When the problem is of the minimization nature, we assign in the objective function a coefficient of +M to each of artificial variables. It is attempted to prohibit the appearance of artificial variables in the solution by assigning these coefficients: an extremely large value when objective is to minimize. (2 marks)

(ii) s1, s2will NOT be part of the initial solution.

If Surplus Variables are included in the basis, the elements of the Surplus Variables will be –1. This is contrary to the non-negativity restriction. This problem is solved by adding Artificial Variable to the equations, that is, a variable that has a positive value.

Artificial Variables do not represent any quantity relating to the decision problem and must not be present in the final solution (if at all they do, it represents a situation of infeasibility).

Accordingly, in the initial tableau we will place Artificial Variables only to eliminate the impact of them first. (2 marks)

Question 5

Selling Price to Yield 20% Return on Investment (2 marks)

Investment (`)	3,00,000
Required ROI (after tax) 20% [(20% of `3,00,000)](`)	60,000
Tax Rate	30%
After Tax Profit	70%

Pre Tax Profit [(`60,000 ÷ 70) × 100] (`)	85,714.29
Sales (Total Cost + Required Profit) {(`1,00,000 + `1,20,000) + `80,000 + `85,714.29}	3,85,714.29
Number of Units Produced	40,000
Selling Price *per unit*(`3,85,714.29 ÷ 40,000 units) (`)	9.64

(b) Selling Price to Yield 6% Profit on List Price, When Trade Discount is 40%-

Let 'K' be the List Sales

$$\{\text{List Sales } (1 - \text{Trade Discount}) - \text{Total Cost}\} \times (1 - \text{Tax Rate}) = 0.06K$$

$$\{K\,(1 - 0.40) - 3,00,000\} \times (1 - 0.30) = 0.06K$$

$$\{0.60\,K - 3,00,000\} \times 0.7 = 0.06K$$

$$0.36\,K = 2,10,000$$

$$K = \text{`}5,83,333.3$$

$$K = 3$$

List Sales Price *per unit* is `14.58 $\frac{\text{`}5,83,333.33}{40,000 \text{ units}}$

Net Selling Price *per unit* is `8.75 (`14.58 – 40% of `14.58).

(3 marks)

Question 5

Random No. Coding for Fresh Cake (1 mark)

No. of Cakes	Probability	Cumulative Probability	Random Numbers
100	0.01	0.01	00 – 00
101	0.03	0.04	01 – 03
102	0.04	0.08	04 – 07
103	0.07	0.15	08 – 14
104	0.09	0.24	15 – 23
105	0.11	0.35	24 – 34
106	0.15	0.50	35 – 49
107	0.21	0.71	50 – 70
108	0.18	0.89	71 - 88
109	0.09	0.98	89 - 97
110	0.02	1.00	98 - 99

Random No. Coding for One Day Old Cake (1 mark)

No. of Cakes	Probability	Cumulative Probability	Random Numbers
0	0.70	0.70	00 – 69
1	0.20	0.90	70 – 89
2	0.08	0.98	90 – 97
3	0.02	1.00	98 – 99

Let us simulate the sale of fresh and one day old cakes for the next ten days using the given random numbers / information.

Simulation Sheet (4 marks)

Day	R. No. of Fresh Cake	Fresh Stock	Demand	Sales Pcs.	Cl. Stock	Order Initiated	One Day Old Stock	R.N. of Old Cake	Sale of Old Cake Pcs.	Loss Pcs.
1	37	105	106	105	0	110	0	17	--	--
2	73	110	108	108	2	105	0	28	--	--
3	14	105	103	103	2	105	2	69	0	2
4	17	105	104	104	1	105	2	38	0	2
5	24	105	105	105	0	110	1	50	0	1
6	35	110	106	106	4	105	0	57	--	--
7	29	105	105	105	0	110	4	82	1	3
8	37	110	106	106	4	105	0	44	--	--
9	33	105	105	105	0	110	4	89	1	3
10	68	110	107	107	3	105	0	60	--	--
				1,054					2	11

Calculation of Vendor's Profit (2 marks)

	Amount (`)
Sales of Fresh Cakes (1,054 Pcs. × `7)	7,378.00
Sale of One Day Old Cake (2 Pcs. × `2)	4.00
Total Sales Revenue	7,382.00
*Less:*Cost of Cakes Sold[`4.50 × (1,054 + 2) Pcs.]	4,752.00
Less: Cost of Spoilt Cakes [`4.50 × (11 + 3*) Pcs.]	63.00
Profit	2,567.00

Question 6

The condition for degeneracy is that the number of allocations in a solution is less than m+n-1. (1 mark)

The given problem is an unbalanced situation and hence a dummy row is to be added, since the column quantity is greater than that of the row quantity. The total number of rows and columns will be 9 i.e. (5 rows and 4 columns). Therefore, m+n-1 = 8, i.e. if the number of allocations is less than 8, then degeneracy would occur. (3 marks)

Question 7

Situation	Appropriate pricing

		Policy
(i)	'W' is a new product for the company and the market and meant for large scale production and long term survival in the market. Demand is expected to be elastic.	Penetration Pricing
(ii)	'X' is a new product for the company, but not for the market. X's success is crucial for the company's survival in the long term.	Market Price or Price just below market price
(iii)	'Y' is a new product to the company and the market. It has an inelastic market. There needs to be an assured profit to cover high initial costs and the unusual sources of capital have uncertainties blocking them.	Skimming Pricing
(iv)	'Z' is a perishable item, with more than 80% of its shelf life over.	Any Cash Realizable value*

(* this amount decreases every passing day)

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