FINAL CA – November 2017

ADVANCED MANAGEMENT ACCOUNTING

Test Code – P 43

Branch (MULTIPLE) (Date : 13.08.2017)

(50 Marks)

Note : All questions are compulsory.

Question 1 (8 Marks)

The Initial basic solution worked out by the shipping clerk is as follows-

Warehouse	Market I	II	III	IV	Supply
A	5	2 **12**	4 **1**	3 **9**	22
B	4	8	1 **15**	6	15
C	4 **7**	6	7 **1**	5	8
Req.	7	12	17	9	45

The initial solution is tested for optimality. The total number of independent allocations is 6 which is equal to the desired (m +n –1) allocations. We introduce u_i's (i = 1, 2, 3) and v_j's (j = 1, 2, 3, 4). Let us assume $u_1 = 0$, remaining u_i's and v_j's are calculated as below-

($u_i + v_j$) Matrix for Allocated / Unallocated Cells

				u_i
1	2	4	3	0
-2	-1	1	0	-3
4	5	7	6	3
v_j 1	2	4	3	

Now we calculate $\Delta ij = Cij - (ui + vj)$ for non-basic cells which are given in the table below-

Δ_{ij} Matrix

4			
6	9		6
	1		**-1**

Since one of the Δ_{ij} 's is negative, the schedule worked out by the clerk is **not the optimal solution**.

(1 mark)

(ii) Introduce in the cell with negative $_{ij}$ [R_3C_4], an assignment. The reallocation is done as follows-

	12	1 +1	9 -1
		15	
7		1 -1	+1

Revised Allocation Table

	12	2	8
		15	
7			1

Now we test the above improved initial solution for optimality-

($u_i + v_j$) Matrix for Allocated / Unallocated Cells

				u_i
2	2	4	3	0
-1	-1	1	0	-3
4	4	6	5	2
v_j 2	2	4	3	

Now we calculate $\Delta ij = Cij - (ui + vj)$ for non-basic cells which are given in the table below-

Δ_{ij} Matrix

3			
5	9		6
	2	1	

Since all $_{ij}$ for non -basic cells are positive, the solution as calculated in the above table is the optimal solution. **(2 Marks)**

The supply of units from each warehouse to markets, along with the transportation cost is given below- **(1 Mark)**

Warehouse	Market	Units	Cost per unit (`)	Total 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
			Minimum Total Shipping Cost	**104**

(a) If the clerk wants to consider the carrier of route C to II only, instead of 7 units to I and 1 unit to IV, it will involve shifting of 7 units from (A, II) to (A, I) and 1 unit to (A, IV) which results in the following table- **(2 marks)**

Warehouse	Market I	Market II	Market III	Market IV	Supply
A	5 **7**	2 **4**	4 **2**	3 **9**	22
B	4	8	1 **15**	6	15
C	4	6 **8**	7	5	8
Req.	7	12	17	9	45

(b)

The transportation cost will become- **(1 mark)**

Warehouse	Market	Units	Cost per unit (`)	Total Cost (`)
A	I	7	5	35
A	II	4	2	8
A	III	2	4	8
A	IV	9	3	27
B	III	15	1	15
C	II	8	6	48
		Minimum Total Shipping Cost		**141**

The total shipping cost will be `141. Additional

Transportation Cost `37.

The carrier of C to II must reduce the cost by **`4.63** (`37/8) so that the total cost of transportation remains the same and clerk can give him business. **(1 mark)**

Question 2 (8 Marks)

Let the P_1, P_2 and P_3 be the three products to be manufactured. Then the data are as follows:

Products	Product ingredients A	B	C	Inert Ingredients
P_1	5 %	10%	5%	80%
P_2	5%	5%	10%	80%
P_3	20%	5%	10%	65%
Cost per kg (`)	64	16	40	16

Cost of Product P_1

= 5% × `64 + 10% × `16 + 5% × `40 + 80% × `16 = `19.60 per kg

Cost of Product P2

= 5% × `64 + 5% × `16 + 10% × `40 + 80% × `16

= `20.80 per kg.

Cost of Product P3

= 20% × `64 + 5% × `16 + 10% × `40 + 65% × `16

= `28.00 per kg.

Let x_1, x_2, and x_3 be the quantity (in kg) of P_1, P_2, and P3 respectively to be manufactured. The LP problem can be formulated:

***Objective function:* (2 marks)**

Maximize Z = (Selling Price − Cost Price) × Quantity of Product

= (`32.60 − `19.60) x_1 + (`34.80 − `20.80) x_2 + (`36.00 − 28) x_3

= $13x_1 + 14x_2 + 8x_3$

Subject to Constraints: (6 marks)

$$1/20x_1 + 1/20x_2 + 1/5x_3 \leq 100$$

Or $$x_1 + x_2 + 4x_3 \leq 2{,}000$$

$$1/10x_1 + 1/20x_2 + 1/20x_3 \leq 180$$

Or $$2x_1 + x_2 + x_3 \leq 3{,}600$$

$$1/20\,x_1 + 1/10\,x_2 + 1/10\,x_3 \leq 120$$

Or $$x_1 + 2x_2 + 2x_3 \leq 2{,}400$$

$$x_1 \leq 30$$

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

Question 3 (8 Marks)

Workings **Statement Showing "Cost Driver Rate" (3 Marks)**

Overhead	Cost(`) - Lacs	Cost Driver	Cost Driver Rate (`)
Production Line Cost	2,310	60,000 Machine Hrs.	3,850 *per hr.* 2,310lacs / 60,000hrs.
Transportation Cost			
Delivery Related (60%)	540	640 Deliveries	84,375 *per delivery* 540lacs / 640delivery
Distance Related (40%)	360	2,25,000 Kms.	160 *per km* 360lacs / 2,25,000kms.

(i) Forecast Total Cost using Activity Based Costing Principles (3 Marks)

Elements of Cost	`
Material	4,75,000.00
Labour	2,50,000.00
Overhead	
Production Line Cost (`3,850 × 6 hrs.)	23,100.00
Transportation Cost -	
Delivery Related $\frac{`84,375}{10 \text{ cars}}$	8,437.50
Distance Related $\frac{`160 \times 50,000 \text{ kms}}{1,000 \text{ cars}}$	8,000.00
Total	7,64,537.50

(ii) Calculation of Cost Gap Between Forecast Total Cost and the Target Total Cost (2 Marks)

Particulars	Amount (`)
Target Selling Price	9,75,000.00
Less: Operating Profit Margin (25%)	2,43,750.00
Target Cost (Target Selling Price – Operating Profit)	7,31,250.00
Forecast Total Cost	7,64,537.50
Cost Gap (`7,64,537.50 – `7,31,250)	33,287.50

Question 4 (6 Marks)

Valid or Invalid

Sl. No.	Statements	Valid or Invalid
(i)	In the introduction stage, usual marketing strategy is to strengthen the supply chain relationships to make the product easily accessible by target customers.	Valid
(ii)	In the introduction stage, competitors will purchase the product to carry out reverse engineering and understand how the product works, so that they can develop their own similar, but different product.	Valid
(iii)	In the introduction phase, the firm will seek to avoid this competition by maintaining its selling price at the end of the introduction stage.	Invalid
(iv)	In the growth stage, if the product cannot be differentiated in other ways, the firm may need further reductions in selling price to maintain growth.	Valid
(v)	In the maturity stage, firms are tempted to engage in costly promotional price wars to wean away market share from competitors.	Valid
(vi)	In the decline stage, failing sales may induce firms to slash marketing expenditure. Brand loyalty will be exploited to create profits.	Valid

Question 5 (6 Marks)

Preparation of Production Cost Budget for 50,000 units for the year 2014 (4 Marks)

Particulars	Cost Per Unit	TotalAmount (`)

Materials (W.N.-1)	1.645	82,237.50
Wages (W.N.-2)	1.43	71,500.00
Variable Overhead	0.50	25,000.00
Fixed Overhead (`35,000 × 110%)	0.77	38,500.00
Total Cost	4.345 (Approx.)	2,17,237.50

Working Notes

1. Material Cost- (1 Marks)

(a) Increase in Material Price in the Year 2013-

$$= \frac{\text{ActualCost per unit in2013} - \text{BudgetedCost per unit in2013}}{\text{BudgetedCost per unit in2013}} \times 100$$

$$= \frac{\frac{`53,750}{43,000 \text{units}} - `1}{`1} \times 100$$

= 25%

(c) Material Required to Produce 50,000 units-

$$= \frac{42,000 \text{ units}}{39,900 \text{ units}} \times 50,000 \text{ units}$$

= 52,632 units (rounded)

(d) Increased Cost for 50,000 units in the Year 2014-

$$= \frac{`53,750}{43,000 \text{ units}} \times 125\% \times 52,632 \text{ units}$$

`82,237.50

Wages- (1 Marks)

Rate *per hour* in 2014-

$$\frac{\text{Wages Paidin the Year 2013}}{\text{Actual Units Produced}} + `0.20$$

$$= \frac{`44,660}{40,600 \text{ units}} + `0.20$$

= `1.30

(b) Wages to be paid for 50,000 units i.e. for 50,000 hours (1 hour per unit). When the labour efficiency is 90% only, then Total Wages will be-

$$= 50,000 \text{ hours} \times \frac{110}{100} \times `1.30$$

= `71,500

Note: **Fixed Overhead** can also be calculated on the basis of previous year's budgeted figure. **Variable Overhead** may also be calculated by taking ` 1 per unit.
This question can also be solve by taking 50,000 hrs. as 90% of total hrs. required to produce the 50,000 units.

Question 6 (6 Marks)

(i) Standard Price per Kg. of Direct Material (1 ½ marks)

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

⇒ 5,000 (F) = Standard Cost of Actual Quantity – ` 5,20,000

Standard Cost of Actual Quantity = ` 5,20,000 + ` 5,000

` 5,25,000

Standard Cost of Actual Quantity = Standard Price per Kg. × Actual Quantity

` 5,25,000 = Standard Price per Kg. × 1,05,000 Kg.

$$\text{Standard Price per Kg.} = \frac{` 5,25,000}{1,05,000 Kg.}$$

= ` 5

(ii) Standard Quantity for each unit of output (1 ½ marks)

Material Usage Variance = Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity

25,000 (A) = Standard Cost of Standard Quantity for Actual Output – ` 5,25,000

Standard Cost of Standard Quantity for Actual Output

= ` 5,25,000 – ` 25,000

= ` 5,00,000

Standard Cost of Standard Quantity for Actual Output

= Standard Price per Kg. ×Standard Quantity for Actual Output

⇒ ` 5,00,000 = ` 5 × Standard Quantity for Actual Output

Standard Quantity for Actual Output

$$= \frac{` 5,00,000}{` 5}$$

= 1,00,000 Kg.

Standard Quantity *for each unit of output*

$$\frac{1,00,000 Kg.}{10 Kg.} \quad 10,000 \text{ units}$$

(i) Standard Rate of Direct Labour Hour (1 marks)

Direct Labour Rate Variance = Standard Cost of Actual Time – Actual Cost

15,500 (A) = Standard Cost of Actual Time – ` 3,08,000

Standard Cost of Actual Time = ` 3,08,000 – ` 15,500.

=` 2,92,500

Standard Cost of Actual Time = Standard Rate per hr. × Actual Hours

` 2,92,500 = Standard Rate per hr. × 19,500 hrs.

Standard Rate per hr. = ` 2,92,500 / 19,500 hrs. = 15

(i) Standard Time for Actual Production (1 marks)

Labour Efficiency Variance = Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time

7,500 (F) = Standard Cost of Standard Time for Actual Production – ` 2,92,500

Standard Cost of Standard Time for Actual Production = ` 2,92,500 + ` 7,500 =` 3,00,000

Standard Cost of Standard Time for Actual Production = Standard Rate per hr.× Standard Time for Actual Production

300000 = ` 15 × Standard Time for Actual Production

Standard Time for Actual Production = 300000/15 = 20000 hours

(ii) Standard Variable Overhead Rate(1 marks)

Variable Overhead Variance = Standard Variable Overheadsfor Production – Actual Variable Overheads

10,000 (A) = Standard Variable Overheads for Production – ` 4,10,000

Standard Variable Overheads for Production = ` 4,10,000 – ` 10,000 =` 4,00,000

Standard Variable Overheads for Production = Standard Variable Overhead Rate Unit × Actual Production (Units)

` 4,00,000 = Standard Variable Overhead Rate Unit x 10000 units

Standard Variable Overhead Rate Unit = 40

Or

Standard Variable Overheads for Production = Standard Variable Overhead Rate per Hr × Std Hrs for Actual Production

` 4,00,000 = Standard Variable Overhead Rate per Hour × 20,000 hrs

Standard Variable Overhead Rate *per hour* = *20*

Question 7 (8 Marks)

(i) Direct Material Usage Variance

= Standard Cost of Standard Quantity for Actual Production – Standard Cost of Actual Quantity

$= \left(\frac{₹\ 28,80,000}{60,000 \text{ units}} \times 66,000 \text{ units}\right) - \left(\frac{₹\ 36,30,000}{₹\ 11} \times ₹\ 12\right)$ 1 ½ mark

= ₹ 31,68,000 – ₹ 39,60,000

= ₹ 7,92,000 (A)

(ii) Direct Material Price Variance

= Standard Cost of Actual Quantity – Actual Cost 1 mark

= ₹ 39,60,000 – ₹ 36,30,000

= ₹ 3,30,000 (F)

(iii) Direct Labour Efficiency Variance

= Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time 1 ½ mark

$$= \left(\frac{₹\ 43,20,000}{60,000\ \text{units}} \times 66,000\ \text{units}\right) - \left(\frac{₹\ 52,80,000}{₹\ 10} \times ₹\ 9\right)$$

= ₹ 47,52,000 – ₹ 47,52,000

= NIL

(iv) Direct Labour Rate Variance

= Standard Cost of Actual Time – Actual Cost 1 mark

= ₹ 47,52,000 – ₹ 52,80,000

= ₹ 5,28,000 (A)

(v) Variable Overhead Cost Variance

= Standard Variable Overheads for Production – Actual Variable Overheads

$$= \left(\frac{₹\ 72,00,000}{60,000\ \text{units}} \times 66,000\ \text{units}\right) - ₹\ 81,84,000$$ 1 ½ mark

= ₹ 2,64,000 (A)

(vi) Sales Margin Volume Variance

= Standard Margin – Budgeted Margin*

$$= \left(\frac{₹\ 36,00,000}{60,000\ \text{units}} \times 66,000\ \text{units}\right) - ₹\ 36,00,000$$ 1 ½ mark

= ₹ 3,60,000 (F)

(*) Budgeted Margin

= ₹ 1,80,00,000 – ₹ 1,44,00,000

= ₹ 36,00,000

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