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# SUGGESTED SOLUTION

## CA INTERMEDIATE

**SUBJECT- COSTING**

## Test Code – CIM 8510

**BRANCH - () (Date :)**

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**ANSWER - 1**

**ANSWER – A**

(1) A = Annual usage of parts = Monthly demand for monitors × 4 parts × 12 months

= 2,000 monitors × 4 parts × 12 months = 96,000 units

O = Ordering cost per order = Rs. 1,000 / - per order

$C_1$ = Cost per part = Rs. 350/-

${}_iC_1$ = Inventory carrying cost per unit per annum

= 20% × Rs. 350 = Rs. 70 /- per unit, per annum

Economic order quantity (EOQ) :

E.O.Q. = $\sqrt{\frac{2AO}{iC_1}} = \sqrt{\frac{2\times 96{,}000\ units \times Rs.1{,}000}{Rs.70}}$

= 1,656 parts (approx.)

The supplier is willing to supply 30,000 units at a discount of 5%, therefore cost of each part shall be Rs. 350 – 5% of 350 = Rs. 332.5

**Total cost (when order size is 30,000 units) :**

= Cost of 96,000 units + Ordering cost + Carrying cost.

= (96,000 units × Rs. 332.50) + $\left(\frac{96{,}000\ units}{30{,}000\ units} \times Rs.1{,}000\right) + \frac{1}{2}$ (30,000 units × 20% × Rs. 332.50)

= Rs. 3,19,20,000 + Rs. 3,200* + Rs. 9,97,500 = Rs. 3,29,20,700

**Total cost (when order size is 1,656 units) :**

= (96,000 units × Rs. 350) + $\left(\frac{96{,}000\ units}{1{,}656\ units} \times Rs.1{,}000\right) + \frac{1}{2}$ (1,656 units × 20% × Rs. 350)

= Rs. 3,36,00,000 + Rs. 57,970* + Rs. 57,960 = Rs. 3,37,15,930

Since, the total cost under the supply of 30,000 units with 5% discount is lower than that when order size is 1,656 units, therefore the offer should be accepted.

Note : While accepting this offer consideration of capital blocked on order size of 30,000 units has been ignored.

*Order size can also be taken in absolute figure.

**(3 MARKS)**

(2) Reorder level

= Maximum consumption × Maximum re – order period

= 710 units × 5 weeks = 3,550 units

**(1 MARK)**

(3) Maximum level of stock

= Re – order level + Reorder quantity – (Min. usage × Min. reorder period)

= 3,550 units + 1,656 units – (140 units × 3 weeks) = 4,786 units.

**(1 MARK)**

(4) Minimum level of stock

Re – order level – Normal usage × Average reorder period

= 3,550 units – (425 units × 4 weeks) = 1,850 units. **(1 MARK)**

**ANSWER – B**

**Calculation of :**

1. Time saved and wages :

| **Workmen** | **A** | **B** |
|---|---|---|
| Standard time (hrs.) | 40 | 40 |
| Actual time taken (hrs.) | 32 | 30 |
| Time saved (hrs.) | 8 | 10 |
| Wages paid @ Rs. × per hr. (Rs.) | 32x | 30x |

**(1.5 MARKS)**

2. Bonus Plan :

| | **Halsey** | **Rowan** |
|---|---|---|
| Time saved (hrs.) | 8 | 10 |
| Bonus (Rs.) | 4x | 7.5x |
| | $\left[\frac{8\ hrs\ \times Rs.x}{2}\right]$ | $\left[\frac{10\ hrs}{40\ hrs} \times 30\ hrs \times Rs\ x\right]$ |

**(1 MARK)**

3. Total wages :

Workman A : 32x + 4x = Rs. 36x

Workman B : 30x + 7.5x = Rs. 37.5x

**Statement of factory cost of the job**

| **Workmen** | **A (Rs.)** | **B (Rs.)** |
|---|---|---|
| Material cost (assumed) | y | Y |
| Wages (shown above) | 36x | 37.5x |
| Works overhead | 240 | 225 |
| Factory cost (given) | 2,600 | 2,600 |

The above relations can be written as follows :

36x + y + 240 = 2,600 (i)

37.5x + y + 225 = 2,600 (ii)

Subtracting (i) from (ii) we get

1.5x – 15 = 0

Or, 1.5x = 15

Or, x = Rs. 10 per hour

On substituting the value of x in (i) we get y = Rs. 2,000

Hence, the wage rate per hour is Rs. 10 and the cost of raw material is Rs. 2,000 on the job.

**Statement of element of cost**

| Workmen | A (Rs.) | B (Rs.) |
|---|---|---|
| Material cost | 2,000 | 2,000 |
| Wages (@ 10 per hour) | 360 | 375 |
| Works overhead | 240 | 225 |
| Factory cost | 2,600 | 2,600 |

**(3.5 MARKS)**

**ANSWER - 2**

**ANSWER – A**

(i) Calculation of Economic Order Quantity :

EOQ = $\sqrt{\frac{2 \times A \times O}{Ci}} = \sqrt{\frac{2\times(60{,}000\ packs \times 12\ months)\times Rs.240}{Rs.228\times 10\%}}$

= 3,893.3 packs or 3,893 packs.

**(ii) Number of orders per year**

$\frac{Annual\ requirements}{E.O.Q.} = \frac{7{,}20{,}000\ packs}{3{,}893\ packs}$ = 184.9 or 185 orders a year

**(iii) Ordering and storage costs**

| | Rs. |
|---|---|
| Ordering costs : - 185 orders × Rs. 240 | 44,400.00 |
| Storage Cost : - ½ (3,893 packs × 10% of Rs. 228) | 44,380.20 |
| Total cost of ordering & storage | 88,780.20 |

**(3*1 = 3 MARKS)**

(iv) Timing of next order

(a) Day's requirement served by each order.

Number of days requirements = $\frac{No.of\ working\ days}{No.of\ order\ in\ a\ year} = \frac{360\ days}{185\ orders}$ = 1.94 days supply.

This implies that each order of 3,893 packs supplies for requirements of 1.94 days only.

(b) Days requirement covered by inventory

= $\frac{Units\ in\ inventory}{Economic\ order\ quantity}$ ×(Day's requirement served by an order)

$\therefore \frac{10{,}033\ pakcs}{3{,}893\ packs}$ × 1.94 days = 5 days requirement

(c) Time interval for placing next order

Inventory left for day's requirement – Average lead time of delivery

5 days – 5 days = 0 days

This means that next order for the replenishment of supplies has to be placed immediately.

**(3*1 = 3 MARKS)**

**ANSWER – B**

**(a) Labour turnover rate :**

It comprises of computation of labour turnover by using following methods :

(i) Replacement Method :

Labour turnover rate = $\frac{No.of\ workers\ replaced}{Average\ number\ of\ workers} \times 100$

$= \frac{75}{1{,}000} \times 100 = 7.5\%$

Equivalent Annual Turnover Rate = $\frac{7.5 \times 365}{31} = 88.31\%$

**(1 MARK)**

(ii) Separation Method :

Labour turnover rate = $\frac{No.of\ workers\ left + No.of workers\ discharged}{Average\ number\ of\ workers} \times 100$

$= \frac{(40+60)}{(900+1100) \div 2} \times 100 = \frac{100}{1{,}000} \times 100 = 10\%$

Equivalent Annual Turnover Rate = $\frac{10 \times 365}{31} = 117.74\%$

**(1 MARK)**

(iii) Flux Method :

Labour turnover rate = $\frac{No.of\ separations + No.of\ accessions}{Average\ number\ of\ workers} \times 100$

$= \frac{(100 + 300)}{(900 + 1{,}100) \div 2} \times 100 = \frac{400}{1{,}000} \times 100 = 40\%$

Equivalent Annual Turnover Rate = $\frac{40 \times 365}{31} = 470.97\%$

**(2 MARKS)**

**OR**

**(iii)** Flux Method :

Labour turnover rate = $\frac{No.of\ separation + No.\ of\ replaced}{Average\ number\ of\ workers} \times 100$

$\frac{100 + 75}{1000} \times 100$ = 17.5%

Equivalent Annual Turnover Rate = $\frac{17.5 \times 365}{31}$ = 206.05%

**ANSWER - 3**

**ANSWER – A**

**(i) Calculation of Economic Order Quantity**

EOQ = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 12{,}000\ units \times Rs.1{,}800}{Rs.640 \times 18.75\ /100}}$ = 600 units

**(1 MARK)**

**(ii) Evaluation of Profitability of Different Options of Order Quantity**

When EOQ is ordered

| | **(Rs.)** |
|---|---|
| Purchase Cost (12,000 units × Rs. 640) | 76,80,000 |
| Ordering Cost $\left[\frac{A}{Q} \times O - (12{,}000\ units\ /600\ units) \times Rs.1{,}800\right]$ | 36,000 |
| Carrying Cost $\left(\frac{Q}{2} \times C \times i - 600\ units\ \times Rs.640\ \times {}^{1}/_{2} \times 18.75/100\right)$ | 36,000 |
| Total Cost | 77,52,000 |

**(2 MARKS)**

**(b) When Quantity Discount is accepted**

| | **(Rs.)** |
|---|---|
| Purchase Cost (12,000 units × Rs. 608) | 72,96,000 |
| Ordering Cost $\left[\frac{A}{Q} \times O\ (12{,}000units/\ 3000\ units) \times Rs.1{,}800\right]$ | 7,200 |
| Carrying Cost $\left[\frac{Q}{2} \times C \times i\left(3{,}000\ units\ \times Rs.608\ \times {}^{1}/_{2} \times 18.75/100\right)\right]$ | 1,71,000 |
| Total Cost | 74,74,200 |

**Advise -** The total cost of inventory is higher if EOQ is adopted. If M/s. X Private Limited gets a discount of 5% on the purchases of "SKY BLUE" (if order size is 3,000 components at a time), there will be financial benefit of Rs. 2,77,800 (77,52,000 – 74,74,200). However, order size of big quantity will increase volume of average inventory to 5 times. There may be risk of shrinkage, pilferage and obsolescence etc., of inventory due to increase in the average volume of inventory holding. This aspect also has to be taken into consideration before opting the discount offer and taking final decision.

**(2 MARKS)**

**ANSWER – B**

Output by experienced workers in 50,000 hours = $\frac{50,000}{10}$ = 5,000 units

∴ Output by new recruits = 60% of 5,000 = 3,000 units

Loss of output = 5,000 – 3,000 = 2,000 units

Total loss of output = Due to delay recruitment + Due to inexperience

= 10,000 + 2,000 = 12,000 units

Contribution per unit = 20% of Rs. 180 = Rs. 36

Total contribution lost = Rs. 36 × 12,000 units = Rs. 4,32,000

Cost of repairing defective units = 3,000 units × 0.2 × Rs. 25 = Rs. 15,000

**Profit forgone due to labour turnover**

| | **Rs.** |
|---|---|
| Loss of Contribution | 4,32,000 |
| Cost of repairing defective units | 15,000 |
| Recruitment cost | 1,56,340 |
| Training cost | 1,13,180 |
| Settlement cost of workers leaving | 1,83,480 |
| Profit forgone in 2017 – 18 | 9,00,000 |

**(5 MARKS)**

**ANSWER - 4**

(i) Computation of wages of each worker under guaranteed hourly rate basis

| **Worker** | **Actual hours Worked(Hours)** | **Hourly wage rate (Rs.)** | **(Wages) (Rs.)** |
|---|---|---|---|
| I | 380 | 40 | 15,200 |
| II | 100 | 50 | 5,000 |
| III | 540 | 60 | 32,400 |

**(2 MARKS)**

(ii) Computation of Wages of each worker under piece work earning basis

| **Product** | **Piece rate per unit (Rs.)** | **Worker – I** | | **Worker – II** | | **Worker – III** | |
|---|---|---|---|---|---|---|---|
| | | **Units** | **Wages (Rs.)** | **Units** | **Wages (Rs.)** | **Units** | **Wages (Rs.)** |
| A | 15 | 210 | 3,150 | - | - | 600 | 9,000 |
| B | 20 | 360 | 7,200 | - | - | 1,350 | 27,000 |
| C | 30 | 460 | 13,800 | 250 | 7,500 | - | - |
| Total | | | 24,150 | | 7,500 | | 36,000 |

Since each worker's earnings are more than 50% of basic pay. Therefore, worker – I, II and III will be paid the wages as computed i.e. Rs. 24,150, Rs. 7,500 and Rs. 36,000 respectively.

**Working Notes :**

1. Piece rate per unit

| Product | Standard time per unit in minute | Piece rate each minute (Rs.) | Piece rate per unit (Rs.) |
|---|---|---|---|
| A | 15 | 1 | 15 |
| B | 20 | 1 | 20 |
| C | 30 | 1 | 30 |

2. Time allowed to each worker

| Worker | Product – A | Product – B | Product – C | Total Time (Hours) |
|---|---|---|---|---|
| I | 210 units × 15 = 3,150 | 360 units × 20 = 7,200 | 460 units × 30 = 13,800 | 24,150 / 60 = 402.50 |
| II | - | - | 250 units × 30 = 7,500 | 7,500/ 60 = 125 |
| III | 600 units × 15 = 9,000 | 1,350 units × 20 = 27,000 | - | 36,000/60 = 600 |

**(4 MARKS)**

**(iii)** Computation of wages of each worker under Premium bonus basis (where each worker receives bonus based on Rowan Scheme)

| Worker | Time Allowed (Hr.) | Time Taken (Hr.) | Time Saved (Hr.) | Wage Rate per hour(Rs.) | Earnings (Rs.) | Bonus | Total Earning (Rs.) |
|---|---|---|---|---|---|---|---|
| I | 402.5 | 380 | 22.5 | 40 | 15,200 | 850 | 16,050 |
| II | 125 | 100 | 25 | 50 | 5,000 | 1,000 | 6,000 |
| III | 600 | 540 | 60 | 60 | 32,400 | 3,240 | 35,640 |

* $\frac{Time\ Taken}{Time\ Allowed} \times Time\ Saved\ \times WageRate$

Worker – I = $\frac{380}{402.5} \times 22.5 \times 40$ = 850

Worker – II = $\frac{100}{125} \times 25 \times 50$ = 1,000

Worker – III = $\frac{540}{600} \times 60 \times 60$ = 3,240

**(4 MARKS)**

**ANSWER – 5**

**Workings**

Basic wage rate : ₹ 100 per hour

Overtime wage rate before and after working hours : ₹ 100 × 175% = ₹ 175 per hour

Overtime wage rate for Sundays and holidays : ₹ 100 × 225% = ₹ 225 per hour

**Computation of average inflated wage rate (including overtime premium):**

| Particulars | Amount (₹) |
|---|---|
| Annual wages for the previous year for normal time (1,00,000 hrs. × ₹100) | 1,00,00,000 |
| Wages for overtime before and after working hours (20,000 hrs. × ₹ 175) | 35,00,000 |
| Wages for overtime on Sundays and holidays (5,000 hrs. × ₹ 225) | 11,25,000 |
| **Total wages for 1,25,000 hrs.** | **1,46,25,000** |

Average inflated wage rate = $\frac{₹1,46,25,000}{1,25,000 \text{ hours}}$ = ₹117

**(5 MARKS)**

**(a)** ***Where overtime is worked regularly as a policy due to workers' shortage:***

The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate. Hence, employee cost chargeable to job Z

= Total hours × Inflated wage rate = 1,125 hrs. × ₹ 117 = ₹ **1,31,625**

**(b)** ***Where overtime is worked irregularly to meet the requirements of production:***

Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:

Employee cost chargeable to Job Z: 1,125 hours @ ₹100 per hour = ₹ 1,12,500

Factory overhead: {100 hrs. × ₹ (175 – 100)} + {25 hrs. × ₹ (225 – 100)} = {₹7,500 + ₹3,125} = ₹ **10,625**

**(c)** ***Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under:***

| | | | |
|---|---|---|---|
| Job Z Employee cost | 1,125 hrs. @ ₹ 100 | = | 1,12,500 |
| Overtime premium | 100 hrs. @ ₹ (175 – 100) | = | 7,500 |
| | 25 hrs. @ ₹ (225 – 100) | = | 3,125 |
| | **Total** | | **1,23,125** |

**(3 MARKS)**