

Answer 1

(i) $EOQ = \sqrt{\frac{2ab}{CS}}$

where

a = Annual consumption

b — Buying cost per order

C = Cost per unit

S = Storage and other inventory carrying cost rate

EOQ for Super Grow	EOQ for Nature's Own
$EOQ = \sqrt{\frac{2 \times 2,000 \times 1,200}{480}}$	$EOQ = \sqrt{\frac{2 \times 1,280 \times 1,400}{560}}$
$= \sqrt{10,000}$ or 100 bags	$= \sqrt{6,400}$ or 80 bags

- (ii) Total annual relevant cost for Super Grow Fertilizer
 = Total annual relevant ordering costs + Total annual relevant carrying cost
 = $(1,200/100) \times 2,000 + \frac{1}{2} \times 100 \text{ bags} \times 480$
 = Rs. 24,000 + Rs. 24,000 = Rs. 48,000

Total annual relevant costs for Nature's Own Fertilizer
 = Total annual relevant ordering costs + Total annual relevant carrying costs
 = $(1,400/80) \times 1,280 \text{ bags} + \frac{1}{2} \times 80 \text{ bags} \times \text{Rs. } 560$
 = Rs. 22,400 + Rs. 22,400 = Rs. 44,800

- (iii) Number of deliveries for Super Grow Fertilizer per year
 = $\frac{\text{Annual Demand of Fertilizer bags}}{EOQ}$
 = $2,000 \text{ bags} / 100 \text{ bags} = 20 \text{ orders}$
 Number of deliveries for Nature's Own Fertilizer per year
 = $1,280 \text{ bags} / 80 \text{ bags} = 16 \text{ orders}$

Answer 2

This cost of placing an order, when component is purchased, is not given. This can be found out by EOQ formula.

$$EOQ = \sqrt{\frac{2 \times \text{Annual consumption} \times \text{Cost of placing an order}}{\text{Cost of carrying one unit of inventory for one year}}}$$

Suppose cost of placing an order is x.

Substituting the available information

$$2,000 = \sqrt{\frac{2 \times 20,000 \times x}{0.25}} \text{ or } x = \text{Rs. } 25$$

Cost of placing an order = Rs. 25

Average stock level = Minimum stock level + $\frac{1}{2}$ EOQ = $400 + \frac{1}{2} (2,000)$
 = 1,400 units

Comparison of annual costs

Make		Buy	
(i) Storage cost 1,400 x 0.25	350	Purchase Cost : 20,000 x 9	1,80,000
(ii) Ordering cost (20,000 ÷ 2,000) x 25	250		
(iii) Material cost 20,000 x 2	40,000		
(iv) Labour cost 20,000 x 6	1,20,000		
(v) Rental charges Rs. 200 x 12	2,400		
	1,63,000		1,80,000

Conclusion : The company should make the component till it has some alternative use for existing capacity. If it is possible to find an alternative use for existing capacity so that opportunity cost exceeds Rs. 17,000, i.e., ` 1,80,000 - ` 1,63,000, buying will become better than manufacturing. Labour cost has been presumed to be variable cost. Fixed cost being sunk cost is not relevant for decision making.

Answer 3

Before preparing Process III A/e process cost sheet should be prepared.

**Process A Period
(FIFO Method)
Statement of Equivalent Production**

Opening Stock 1,000 units

Introduced 42,600 units

Input		Output		Equivalent Production					
Item	Units	Item	Units	Material A		Material B		Labour & Overheads	
				Units	%	Units	%	Units	%
Op. stock	1,000	Normal loss	2,000	-	-	-	-	-	-
Process transfer	42,600	Completed :							
		O/stock	1,000	-	-	300	30	500	50
		Introduced & completed	36,800	36,800	100	36,800	100	36,800	100
		Abnormal loss	200	200	100	200	100	160	80
		Closing stock	3,600	3,600	100	2,880	80	2,160	60
	43,600		43,600	40,600		40,180		39,620	

Statement of cost for each Element

Elements of cost	Cost Rs.	Equivalent Production Units	Cost per unit Rs.
Material A :			
Transfer from previous process	3,30,800		
Less value of normal scrap	6,000*	40,600	8
Material B :			
Added in the process	1,60,720	40,100	4
Direct Wages	79,240	39,620	2
Overhead	39,620	39,620	1
Total	6,04,380		

*Important Note : It is a convention that the scrap value of normal loss should be deducted from the cost of materials and more specifically where appropriate from the cost of materials input from the previous process.

Statement of Apportionment of Cost

Items	Elements	Equivalent production Units	Cost per unit Rs,	Cost Rs.	Total Rs.
O/Stock (For completion)	Material A	-	-	-	-
	Material B	300	4	1,200	-
	Wages	500	2	1,000	
	Overhead	500	1	500	2,700
Introduced and completed during the period	Material A	36,800	8	2,94,400	
	Material B	36,800	4	1,47,200	
	Wages	36,800	2	73,600	
	Overhead	36,800	1	36,800	5,52,000
Closing stock	Material A	3,600	8	28,800	
	Material B	2,880	4	11,520	
	Wages	2,160	2	4,320	
	Overhead	2,160	1	2,160	46,800
Abnormal loss	Material A	200	8	1,600	
	Material B	200	4	800	
	Wages	160	2	320	
	Overhead	160	1	160	2,880
	Total Cost				6,04,380

Process III Account

Details	Units	Amount	Details	Units	Amount
To Balance b/d	1,000	Rs.14,400	By Normal Loss	2,000	Rs.6,000
To Process II A/c	42,600	3,30,800	By Process IV A/c	37,800	5,69,100
Materials		1,60,720	By Abnormal loss	200	2,880
Wages		79,240	By C/Stock	3,600	46,800
Overhead		39,620			
	43,600	6,24,780		43,600	6,24,780

Note :-

- (i) Units processed during the period
= units transferred to process + Opening stock
- (ii) Production = Opening stock + Units introduced - Closing units
= 1,000 + 42,600 - 3,600 = 40,000
- (iii) Normal loss s= 5% of 40,000
- (iv) Cost of transfer to process (IV)
- | | |
|---|-----------------|
| (a) Value of opening stock | 14,400 |
| (b) Cost incurred for completing the units representing O/stock during the period | 2,700 |
| (c) Cost for units introduced and completed during the period | <u>5,52,000</u> |
| | <u>5,69,100</u> |

Answer 4

Production:

Sales 53,000 units
 Finishing goods inventory 6,000 units
59,000 units

Requirements of Chemical L: Kilos
 Production of 59,000 needs (59,000 x 4 kilos) 2,36,000
 Decrease in inventory 50,000
 Total kilos needed 1,86,000

Note : Each unit of N require 4 kilos of chemical L.

Answer 5

Actual expenditure on overheads Rs. 1,08,000
 Fixed overheads under-budget 8,000

Budgeted expenditure on overheads	1,16,000
Less: Budgeted variable overhead 22,000 x RS. 3	<u>66,000</u>
Budgeted fixed overhead expenditure	<u>50,000</u>

Answer 6

**Process A Period—February 1999
(FIFO Method)
Statement of Equivalent Production**

Input		Output		Equivalent Production			
Particulars	Units	Particulars	Units	Material		Labour and Overhead	
				Units	%	Units	%
Opening stock Units introduced	4,000 16,000	Units completed : (a) Work on opening stock (b) New units completed Closing stock	4,000 10,000 6,000	— 10,000 6,000	 100 100	3,000 10,000 2,000	75 100 331/3
	20,000		20,000	16,000		15,000	

Statement of Cost for each Element

Elements of Cost	Cost	Equivalent units	Cost per units
Material	Rs. 5,120	16,000	Re. 0.32
Labour	3,000	15,000	0.20
Overhead	3,000	15,000	0.20

Note : Only cost for the period will be considered in this statement.

Statement of Apportionment of Cost

Items	Elements	Equivalent production	Cost per unit Re.	Cost Rs.	Total Rs.
Opening WIP	Material Labour	3,000	0.20	600	— 1,200*
	Overhead	3,000	0.20	600	
Units newly introduced and completed	Material	10,000	0.32	3,200	7,200
	Labour	10,000	0.20	2,000	
	Overhead	10,000	0.20	2,000	
Closing inventory	Material	6,000	0.32	1,920	2,720
	Labour	2,000	0.20	400	
	Overhead	2,000	0.20	400	

*This is the cost incurred on opening work-in-process during the period.

Dr.		Process A Account				Cr.	
Particulars	Units	Amount Rs.	Particulars	Units	Amount Rs.		
To Opening Stock	4,000	1,600	By Finished Stock A/c	14,000	10,000*		
To Unit introduced	16,000		By Closing Stock	6,000	2,720		
Material		5,120					
Labour		3,000					
Overhead		3,000					
	20,000	12,720		20,000	12,720		

* Process A has been credited by an amount of Rs 10,000.

The details for the same are given below:

(i)	Cost already incurred on opening stock	Rs. 1,600
(ii)	Cost of work done for completing the opening stock (Refer to statement of apportionment of cost)	1,200
(iii)	Cost for completing newly introduced units	7,200
	Cost of units completed and transferred to finished stock	10,000

Answer 7**Net income when joint costs are apportioned on sales value basis**

Product (1)	Sales Value (2)	Separate costs (3)	S.V. at split-off Point(2)-(3)—(4)	Apportioned Joint cost (5)	Net income (4)-(5)=(6)
A	Rs. 1,15,000	Rs. 30,000	Rs. 85,000	Rs. 68,000*	Rs. 17,000
B	10,000	6,000	4,000	3,200	800
C	4,000	—	4,000	3,200	800
D	30,000	1,000	29,000	23,200	5,800
	1,59,000	37,000	1,22,000	97,600	24,400

* Rs. 97,600 x 85,000/1,22,000 = Rs. 68,000. Other cost have been calculated similarly.

Net income of each product if sold at split-off point

Product	Output	S.P. per unit	Sales value at split-off point	Allocated J.C.	Net income
A	5,00,000	Re. 0.15	Rs. 75,000	Rs. 65,946#	Rs. 9,054
B	10,000	0.50	5,000	4,397	603
C	5,000	0.80	4,000	3,517	483
D	9,000	3.00	27,000	23,740	3,260
			1,11,000	97,600	13,400

Rs. 97,600 x 75,000/1,11,000 = Rs. 65,946. Other costs have been calculated similarly.

Determination of additional net income by altering the processing decisions

Product	Sales value after further processing	Sales value at ^ Split-off point	Incremental sales value	Separate costs	Incremental gain/loss
A	Rs. 1,15,000	Rs. 75,000	Rs. 40,000	Rs. 30,000	Rs. 10,000
B	10,000	5,000	5,000	6,000	(1,000)
C	4,000	4,000	—	—	—
D	30,000	27,000	3,000	1,000	2,000
	1,59,000	1,11,000	48,000	37,000	11,000

Note : Products A and D should be sold after further processing. However, products B and C should be sold at split-off point.
