CA INTER - **COSTING**

SUPER 40 QN

SEP 24 EXAMS

Prepared By :
CA PURUSHOTTAM AGGARWAL

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He is teaching costing paper at various levels for more than 16 Years.

His **arrears of specialization** include Costing Paper.
At Present he is a professional financial consultant and faculty of Costing Paper at various professional levels e.g. CMA Final, CMA Inter, CA Final & CA Inter.

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Cost & Management Accounting

Super 40 Question

MATERIAL COST

New Concept 1

- Calculation of Total Material Cost in case of **perishable nature of material**
- Total Material Cost = Total Purchase Cost + Total Ordering Cost + Total Carrying Cost
- This Concept Added in Question No.1 of RTP May 2024 Cost & Management Accounting.
- Click link to watch Video **-** https://www.youtube.com/watch?v=GvdLMlHtcDQ

Question 1

Annual Material Usage Requirement – 2,10,000 Kg
EOQ – 14,000 Kg
Normal Material Usage – 700 Kg per day
Ordering Cost – RS.1200 per order
Carrying Cost p.u.p.a. – 15%
Purchase Price – Rs.30 per kg (Without Discount)

- Currently Company orders 15,000 kg in single order to get discount of 10% on purchase price.
- Material is perishable in nature & material gets obsolete if not used within 15 days of receipt of material.

Calculate Saving / loss in purchase of material if purchase order quantity is equal to EOQ

(a) Loss of Rs.8,45,550 (b) Saving of Rs.8,45,550
(c) Loss of Rs.3,01,125 (d) Saving of Rs.3,01,125

Answer – (c) Loss of Rs.3,01,125

Explanation of Answer

Statement showing Total Cost of EOQ & ROQ Level

Purchase Order	**Equals to ROQ**	**Equals to EOQ**
Purchase Order (Size) (Q)	15,000 Kg	14,000 Kg
Annual Reqn. (A)	2,10,000 Kg	2,10,000 Kg
Purchase Price	Rs.30 – Rs.30 x 10% = Rs.27 per kg	Rs.30 per Kg
Total Qty to be Purchased	3,00,000 Kg (Note 1)	2,80,000 Kg (Note 2)
Total No. of Orders	20 Orders (Note 1)	20 Orders (Note 2)
Total Purchase Cost (X)	300000 kg X Rs.27 per kg = Rs.81,00,000	280000 kg X Rs.30 per kg = Rs.84,00,000
Total Ordering Cost (Y)	20 Orders X Rs.1200 = Rs.24000	20 Orders X Rs.1200 = Rs.24000
Total Carrying Cost (Z)	Q/2 X Rs.27 per kg x 15% = 15000 KG / 2 X Rs.4.05 = Rs.30,375	Q/2 X Rs.30 per kg x 15% = 14000 KG / 2 X Rs.4.50 = Rs.31500
Total Material Cost (X+Y+Z)	**81,54,375**	**Rs.84,55,500**

Loss in ordering at EQO shall be Rs.3,01,125

Note 1

- Since material is perishable in nature & material gets obsolete if not used within 15 days of receipt of material. Hence out of ordered material of 15,000 kg, co. shall be able to use 10500 kg (700 kg per day x 15 days). Therefore bal. 4500 kg shall become obsolete.
- Annual material usage requirement is 2,10,000 kg and company is able to use 10500 kg out of ordered Qty. Hence company has to place 20 orders [210000 kg / 10500 kg] to use 210000 kg
- Now it is clear that company shall place 20 orders & will purchase 15000 kg in 1 order hence company shall buy 300000 kg in whole year [20 orders x 15000 kg per order].

Note 2 – Goes exactly same way as in Note 1

- Co. will be able to use only 10500 kg [700 kg x 15 days] out of ordered quantity of 14000 kg hence bal. 3500 kg shall get wasted.
- Co. will have to place 20 orders [210000 kg / 10500 kg] to use 210000 kg.
- Co. shall buy 280,000 kg in whole year [20 orders x 14000 kg per order]

New Concept 2

- Calculation of Maximum Stock Level in case of **Perishable nature of material:** If raw material is perishable in nature then maximum stock level shall be lower of following
  a) **ROL + ROQ – Min. Usage X Min. Lead Time**
  b) **Normal Usage X Perishable Period**
- This Concept Added in Question No.1 of RTP May 2024 Cost & Management Accounting.
- Click link to watch Video **-** **https://www.youtube.com/watch?v=GvdLMlHtcDQ**

Question 2

Calculate maximum stock level using Following information:

a) 10,000 Kg (b) 9000 Kg
(c) 12000 Kg (d) 14400 Kg

Re-Order Level of Material – 2400 KG
Re-Order Quantity of Material – 12000 KG
Minimum Lead Time – 4 Days
Minimum Material Usage – 1100 kg per day
Normal / Average material usage – 1500 kg per order
It is informed that material under consideration is perishable in nature and it becomes useless if not used within

6 days of material receipt.

Answer - (b) 9000 kg
Max. Stock Level as per formula = ROL + ROQ – Min. Usage x Min. Lead Time
= 2400 Kg + 12000 Kg – 1100 Kg x 4 Days = 10000 Kg

Special Note

- Material is perishable in nature and becomes useless if not consumed within 6 days hence entity shall not maintain stock for more than 6 days usage
- Hence max. stock level = Normal Usage x Perishable period = 1500 kg x 6 Days = 9000 Kg

Finally Max. stock level shall be lower of following

a) 10000 Kg
b) 9000 Kg

Max. Stock Level shall be 9000 Kg.

Question 3 IPL Limited uses a small casting in one of its finished products. The castings are purchased from a foundry. IPL Limited purchases 54,000 castings per year at a cost of Rs. 800 per casting.

The castings are used evenly throughout the year in the production process on a 360-days-per-year basis. The company estimates that it costs Rs.9,000 to place a single purchase order and about Rs.300 to carry one casting in inventory for a year. The high carrying costs result from the need to keep the castings in carefully controlled temperature and humidity conditions, and from the high cost of insurance.

Delivery from the foundry generally takes 6 days, but it can take as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the following tabulation:

Delivery time (days)	:	6	7	8	9	10
Percentage of occurrence	:	75	10	5	5	5

Required:

1. Compute the economic order quantity (EOQ).
2. Assume the company is willing to assume a 15% risk of being out of stock. What would be the safety stock? The re-order point?
3. Assume the company is willing to assume a 5% risk of being out of stock. What would be the safety stock? The re-order point?
4. Assume 5% stock-out risk. What would be the total cost of ordering and carrying inventory for one year?

5. Refer to the original data. Assume that using process re-engineering the company reduces its cost of placing a purchase order to only Rs. 600. In addition company estimates that when the waste and inefficiency caused by inventories are considered, the true cost of carrying a unit in stock is Rs. 720 per year.
    a. Compute the new EOQ.
    b. How frequently would the company be placing an order, as compared to the old purchasing policy?

Solution:- A = 54,000 castings, O = Rs. 9,000, C = Rs. 300

1. EOQ = $\sqrt{\frac{2 \times A \times O}{C}}$ = $\sqrt{\frac{2 \times 54{,}000\ castings \times Rs.9{,}000}{Rs.300\ per\ unit\ per\ annum}}$ = 1,800castings
2. Statement showing risk of being out of stock (stock-out situation)

Delivery Time (Days)	% of occurrence	Cumulative %	Stock-out (%)
6	75%	75%	100%-75%=25%
7	10%	85%	100%-85%=15%
8	5%	90%	100%-90%=10%
9	5%	95%	100%-95%=5%
10	5%	100%	100%-100%=0%

Normal annual requirement = 54,000 castings

Average daily consumption = $\frac{54{,}000\ castings}{360\ days}$ = 150 castings

If the company is willing to take 15% risk of stock-out situation then lead time will be 7 days while normal lead time is 6 days as given in question hence safety stock is required to maintain for 1 day.

Safety stock = 1 day x average consumption per day = 1 day x 150 castings = 150 castings

Re-order level = safety stock + normal lead time x normal consumption per day

= 150 castings + 6 days x 150 castings = 1050 castings

3. If the company is willing to take 5% risk of stock-out situation then lead time will be 9 days while normal lead time is 6 days as given in question hence safety stock is required to maintain for 3 day.

Safety stock = 3 day x average consumption per day = 3 day x 150 castings = 450 castings

Re-order level = safety stock + normal lead time x normal consumption per day

= 450 castings + 6 days x 150 castings = 1350 castings

4. Annual relevant cost = annual ordering cost + annual carrying cost for normal stock + annual carrying cost for safety stock

= ($\frac{54{,}000\ castings}{1800\ castings}$xRs.9,000 + ($\frac{1800\ castings}{2}$x Rs. 300) + (450 castings x RS. 300)

= Rs. 6,75,000

5. A = 54,000 castings, O = Rs. 600, C = Rs. 720

EOQ = = $\sqrt{\frac{2 \times 54{,}000\ castings \times Rs.600}{Rs.720\ per\ unit\ per\ annum}}$ = 300castings

Statement showing frequency of orders

	Old Policy	New Policy
No. of orders	$\frac{54{,}000\ castings}{1800\ castings}$ = 30 orders	$\frac{54{,}000\ castings}{300\ castings}$ = 180 orders
Frequency of orders (Time gap between 2 orders)	$\frac{360\ days}{30\ orders}$ = 12 days	$\frac{360\ days}{180\ orders}$ = 2 days

Question 4

Imbrios India Ltd. is recently incorporated start-up company back in the year 2019. It is engaged in creating Embedded products and Internet of Things (IoT) solutions for the Industrial market. It is focused on innovation, design, research and development of products and services. One of its embedded products is LogMax, a system on module (SoM) Carrier board for industrial use. It is a small, flexible and embedded computer designed as per industry specifications. In the beginning of the month of September 2022, company entered into a job agreement of providing 4800 LogMax to NIT, Mandi. Following details w.r.t. issues, receipts, returns of Store Department handling Micro-controller, a component used in the designated assembling process have been extracted for the month of September, 2022:

- Sep. 1 - Opening stock of 6,000 units @ Rs.285 per unit
- Sep. 8 - Issued 4875 units to mechanical division vide material requisition no. Mech 009/22
- Sep. 9 - Received 17,500 units @ Rs.276 per unit vide purchase order no. 159/22
- Sep. 10 - Issued 12,000 units to technical division vide material requisition no. Tech 012/22
- Sep. 12 - Returned to stores 2375 units by technical division against material requisition no. Tech 012/22.
- Sep. 15 - Received 9,000 units @ Rs.288 per units vide purchase order no. 160/2222
- Sep. 17 - Returned to supplier 700 units out of quantity received vide purchase order no. 160/22.
- Sep. 20 - Issued 9,500 units to technical division vide material requisition no. Tech 165/22

On 25th September, 2022, the stock manager of the company expressed his need to leave for his hometown due to certain contingency and immediately left the job same day. Later, he also switched his phone off.
As the company has the tendency of stock-taking every end of the month to check and report for the loss due to rusting of the components, the new stock manager, on 30th September, 2022, found that 900 units of Micro-controllers were missing which was apparently misappropriated by the former stock manager. He, further, reported loss of 300 units due to rusting of the components. From the above information you are required to prepare the Stock Ledger account using 'Weighted Average' method of valuing the issues.

Solution

Store Ledger - Weightage Average Method

Date (Sept)	Receipts			Issues			Stock		
	Qty – Kg	Rate	Amount	Qty – Kg	Rate	Amount	Qty – Kg	Rate	Amount
1							6000	285	1710000
8				4875	285	1389375	1125	285	320625
9	17500	276	4830000				18625	276.54	5150625
10				12000	276.54	3318480	6625	276.54	1832145
12	2375	276.54	656783				9000	276.54	2488928
15	9000	288	2592000				18000	282.27	5080928
17				700	288 WN - 1	201600	17300	282.04	4879328
20				9500	282.04	2679380	7800	282.04	2199948
30				900	282.04 WN – 2	253836	6900	282.04	1946112
30				300	- WN - 3	-	6600	294.87	1946112

Working Note

1. Transaction of 12th Sept – Technical Division Returned 2375 units to Store Department which were issued on 10th Sept. at Rs.276.54. hence such Return from Division to store shall be shown as Receipt of 2375 units at Rs.276.54 i.e. Same price at which these were issued on 10th Sept.
2. Transaction of 17th Sept – Store Dept. Returned to supplier 700 units which were purchased on 15th Sept. via purchase order number – 160/22 at Rs.288. Hence 700 units shall be shown under issues at Rs.288 i.e. Same price at which these were purchased on 15th Sept.
3. "Misappropriated" means "Stolen" hence 900 units are abnormal loss.
4. "Rusting" means normal scrap hence normal loss.

Question 5

AT Ltd. furnishes the following store transactions for September, 20X8:

1-9-X8 Opening balance	25 units value Rs. 162.50
4-9- X8 Issues Req. No. 85	8 units
6-9- X8 Receipts from B & Co. GRN No. 26	50 units @ Rs. 5.75 per unit
7-9- X8 Issues Req. No. 97	12 units
10-9- X8 Return to B & Co.	10 units
12-9- X8 Issues Req. No. 108	15 units
13-9- X8 Issues Req. No. 110	20 units
15-9- X8 **Receipts from M & Co. GRN. No. 33**	25 units @ Rs. 6.10 per unit
17-9- X8 Issues Req. No. 121	10 units
19-9- X8 Received replacement from B & Co. GRN No. 38	10 units
20-9- X8 **Returned from department, material of M & Co. MRR No. 4**	5 units
22-9- X8 Transfer from Job 182 to Job 187 in the dept. MTR 6	5 units
26-9- X8 Issues Req. No. 146	10 units
29-9- X8 Transfer from Dept. "A" to Dept. "B" MTR 10	5 units
30-9- X8 Shortage in stock taking	2 units

PREPARE the priced stores ledger on FIFO method and STATE how would you treat the shortage in stock taking.

Solution 3:- **Working Notes:**

1) Transaction 10th Sept – Store Dept. Returned to B & Co. 10 units which were purchased on 6th Sept at Rs.5.75 hence 10 units shall be shown under issue at Rs.5.75 i.e. same price at which these were purchased.
2) Transaction of 19th Sept – B & Co. replaced 10 units returned on 10th Sept which were returned on B & Co. on 10th Sept. at 5.75 hence these 10 units will be shown under receipts at 5.75 i.e. same price at which these were returned.
3) Transaction of 20th Sept – Division M Returned 5 units to store dept. But information regarding the date on which material was issued to Division M is not given in Question hence it is assumed that Last issue was made to Division M at Rs.5.75 hence these 5 units shall be shown under receipts at Rs.5.75 i.e. same price at which these were issued to Division M. Also note these 5 units shall be shown as first lot now.
4) Shortage is treated as abnormal loss.

Stores Ledger (FIFO Method) – Sept 2008

	Receipts				Issued				Balance		
Date	GRN/ MRN No.	Qty Units	Rate (Rs.)	Amt. (Rs.)	Reqn. No.	Qty Units	Rate (Rs.)	Amt. (Rs.)	Qty Units	Rate (Rs.)	Amt. (Rs.)
1									25	6.50	162.50
4					85	8	6.50	52	17	6.50	110.50
6	26	50	5.75	287.50					17 50	6.50 5.75	110.50 287.50
7					97	12	6.50	78	5 50	6.50 5.75	32.50 287.50
10						10	5.75	57.50	5 40	6.50 5.75	32.50 230.00
12					108	5 10	6.50 5.75	32.50 57.50	30	5.75	172.50
13					110	20	5.75	115	10	5.75	57.50
15	33	25	6.10	152.50					10 25	5.75 6.10	57.50 152.50
17					121	10	5.75	57.50	25	6.10	152.50
19	38	10	5.75	57.50					25 10	6.10 5.75	152.50 57.50
20	4	5	5.75	28.75					5 25 10	5.75 6.10 5.75	28.75 152.50 57.50
26					146	5 5	5.75 6.10	28.75 30.50	20 10	6.10 5.75	122.00 57.50
30					Shortage	2	6.10	12.20	18 10	6.10 5.75	109.80 57.50

EMPLOYEE COST & DIRECT EXPENSES

Question 1

ZED Limited is working by employing 50 skilled workers, it is considering the introduction of incentive scheme-either Halsey scheme (with 50% bonus) or Rowan scheme of wage payment for increasing the labour productivity to cope up the increasing demand for the product by 40%. It is believed that proposed incentive scheme could bring about an average 20% increase over the present earnings of the workers; it could act as sufficient incentive for them to produce more.
Because of assurance, the increase in productivity has been observed as revealed by the figures for the month of April.

Hourly rate of wages (guaranteed)	Rs.30
Average time for producing one unit by one worker at the previous performance (This may be taken as time allowed)	1.975 hours
Number of working days in the month	24
Number of working hours per day of each worker	8
Actual production during the month	6,120 units

Required

(i) Calculate the effective rate of earnings under the Halsey scheme and the Rowan scheme.
(ii) Calculate the savings to the ZED Limited in terms of direct labour cost per piece.
(iii) Advise ZED Limited about the selection of the scheme to fulfill their assurance.

Solution:- Working notes:

1. Computation of time saved (in hours) per month:

(Standard production time for 6,120 units) – (Actual time taken by the workers)

= (6,120 units × 1.975 hours) – (24 days × 8 hours per day × 50 skilled workers)

= (12,087 hours – 9,600 hours)

= 2,487 hours

❖ **Computation of effective rate of earnings under the Halsey and Rowan scheme:**

Total Wages	Hours worked x hourly wage rate + Hours Saved x Hourly wage rate x worker sharing ratio
Halsey	9600 hours × Rs. 30 + 50%× 2,487 hours ×Rs.30= Rs. 3,25,305
Rowan	9600 hours x Rs. 30 +2487 hours x $\frac{9600\ hours}{12087\ hours}$ x Rs. 30 per hour = Rs. 3,47,258.38

Effective rate of earnings per hour under Halsey Plan = $\frac{Total\ Wage\ Payment}{Actual\ Time\ taken}$ = $\frac{Rs.3,25,305}{9600\ hours}$ = Rs. 33.89

Effective rate of earnings per hour (under Rowan Plan) = = $\frac{Total\ Wage\ Payment}{Actual\ Time\ taken}$ = $\frac{Rs.3,47,258.38}{9600\ hours}$ = Rs. 36.17

❖ Savings the ZED ltd in terms of direct labour cost per unit

a. Direct labour cost per unit under time wage system = 1.975 hour x Rs. 30 = Rs. 59.25
b. Direct labour cost per unit under Halsey wage system = $\frac{Total\ wages}{units\ produced}$ = $\frac{Rs.3,25,305}{6120\ units}$ =

Rs. 53.15

c. Direct labour cost per unit under Rowan wage system = $\frac{Total\ wages}{units\ produced}$ = $\frac{Rs.3,47,258.38}{6120\ units}$ = Rs. 56.74

Saving of direct labour cost under:
Halsey Plan (Rs. 59.25 – Rs. 53.15) = Rs.6.10
Rowan Plan (Rs. 59.25 – Rs. 56.74) = Rs.2.51

❖ **Advise to ZED Ltd.: *(*about the selection of the scheme to fulfill assurance to workers)**

Particulars	Amount (Rs.)
Present Time based wages	2,88,000
Wages under Halsey scheme	3,25,305
Wages under Rowan Scheme	3,47,258.38
Desired Increased Total wages (20% over present wages)	2,88,000 x 1.20 = 3,45,600

Only Rowan scheme assure desired increased wages of Rs. 3,45,600 hence **Rowan Plan may be adopted.**

Question 2
In a factory, the basic wage rate is Rs. 10 per hour and overtime rates are as follows :

Before and after normal working hours	:	175% of basic wage rate
Sundays and holidays	:	225% of basic wage rate
During the previous years, the following hours were worked		
Normal Time	:	1,00,000 hours
Overtime before and after working hours	:	20,000 hours
Overtime on Sundays and Saturdays	:	5,000 hours
Total	:	1,25,000 hours

The following hours have been worked on job "Z"
Normal : 1,000 hours
Overtime before and after working days: 100 hours
Sundays and Saturdays: 25 hours
Total hours: 1,125 hours

You are required to calculate the labour cost chargeable to job 'Z' and overhead in each of the following instances:

(a) Where overtime is worked regularly throughout the year as a policy due to the labour shortage.
(b) Where overtime is worked irregularly to meet the requirements of production.
(c) Where overtime is worked at the request of the customer to expedite the job.

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

Basic wage rate : Rs.10 per hour
Overtime wage rate before and after working hours : Rs.10 × 175% = Rs. 17.50 per hour
Overtime wage rate for Sundays and holidays : Rs.10 × 225% =Rs. 22.50 per hour

Annual wages for the previous year for normal time : 1,00,000 hrs. × Rs. 10 = Rs. 10,00,000
Wages for overtime before and after working hours : 20,000 hrs. × Rs. 17.50=Rs. 3,50,000
Wages for overtime on Sundays and holidays : 5,000 hrs. × Rs. 22.50 = Rs.1,12,500
Total wages for 1,25,000 hrs. = Rs.14,62,500
Average inflated wage rate = $\frac{Rs.14,62,500}{125000\ hours}$ = Rs. 11.70

(i) ***Where overtime is worked regularly as a policy due to labour shortage*** :- if labour is in shortage then all the jobs has to bear overtime payment cost.
Hence,
DLC chargeable to job Z = Total hours × Inflated wage rate
= 1,125 hrs. × Rs. 11.70 = Rs. 13,162.50

(ii) Where overtime is worked irregularly

	DLC	**Overhead**
Normal Working 1000 Hours	1000 x 10 = 10000	No Extra Pymt
Overtime – Same Day – 100 Hours	100 x 10 = 1000	100 x 7.50 = 750
Overtime – Sundays – 25 Hours	25 x 10 = 250	25 x 12.50 = 312.50
	11250	**1062.50**

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

	(Rs.)
Job Z labour cost 1,000 hrs. @ Rs. 10	= 10,000
Overtime premium before and after working hours 100 hrs. @ Rs. (17.50)	= 1750.00
Overtime pymt on Sundays 25 hour x Rs. 22.50	= 562.50
Total	**12,312.50**

Question 3
Two workmen, Andrew and Baker, produce the same product using the same material. Andrew is paid bonus according to Halsey plan, while Baker is paid bonus according to Rowan plan. The time allowed to manufacture the product is 100 hours. Andrew has taken 60 hours and Baker has taken 80 hours to complete the product. The normal hourly rate of wages of workman Andrew is Rs. 24 per hour. The total earnings of both the workers are same. Calculate normal hourly rate of wages of workman Baker.
Solution:-

	Andrew	**Baker**
Time allowed (Hours)	100	100
Time taken (Hours)	60	80
Time saved (Hours)	40	20
Let the rate of wages of the worker Baker is 'L' per hour		
Normal Wages	Rs. 1,440 (60 hours× Rs.24)	Rs. 80 L (80 hours× L)
Bonus	Rs. 480*	Rs. 16 L**
Total earnings	Rs. 1,920	Rs. 96 L

* Bonus under Halsey system= hours saved x $\frac{50}{100}$ x hourly wage rate = 40 hours x 50% x Rs. 24 = Rs.480

** Bonus under Rowan system = hours saved x $\frac{time\ taken}{time\ allowed}$ x hourly wage rate

= 20 hours x $\frac{80\ hours}{100\ hours}$ x Rs. L = Rs. 16L

According to the problem,

Total earnings of	Andrew	=	Total earnings of Baker
	Rs. 1,920	=	Rs. 96 L
	L	=	Rs. 20

Therefore, Hourly rate of wages of Baker is Rs. 20 per hour

Question 4

The management of Bina and Rina Ltd. are worried about their increasing labour turnover in the factory and before analyzing the causes and taking remedial steps, they want to have an idea of the profit foregone as a result of labour turnover in the last year.

Last year sales amounted to Rs. 83,03,300 and P/V ratio was 20 per cent. The total number of actual hours worked by the Direct Labour force was 4.45 lakhs. As a result of the delays by the Personnel Department in filling vacancies due to labour turnover, 1,00,000 potentially productive hours were lost. The actual direct labour hours included 30,000 hours attributable to training new recruits, out of which half of the hours were unproductive.

The costs incurred consequent on labour turnover revealed, on analysis, the following:

Settlement cost due to leaving	Rs.43,820
Recruitment costs	Rs.26,740
Selection costs	Rs.12,750
Training costs	Rs.30,490

Assuming that the potential production lost as a consequence of labour turnover could have been sold at prevailing prices, find the profit foregone last year on account of labour turnover.

Solution:

Actual Sales = Rs. 83,03,000

Productive hours = total hours – unproductive hours = 445000 hours – (30000 hours x $\frac{1}{2}$) = 4,30,000 hours

Hours lost due to to delay in filling vacancy due to labour turnover = 1,00,000 hours

Contribution lost due to loss of 1,15,000 hours = $\frac{Rs.83,03,000}{4,30,000\ hours}$x 1,15,000 hours x 20% = Rs. 4,44,130

Statement showing profit foregone last year on account of labour turnover of Bina and Rina Ltd.

	(Rs.)
Contribution foregone (as calculated above)	4,44,130
Settlement cost due to leaving	43,820
Recruitment cost	26,740
Selection cost	12,750
Training costs	30,490
Profit foregone	**5,57,930**

OVERHEADS

Question 1
In an engineering company, the factory overheads are recovered on a fixed percentage basis on direct wages and the administrative overheads are absorbed on a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period:

	Job 101 (Rs.)	Job 102 (Rs.)
Direct Materials	54,000	37,500
Direct Wages	42,000	30,000
Selling Price	1,66,650	1,28,250
Profit Percentage on Total Cost	10%	20%

Required
(i) Computation of percentage recovery rates of factory overheads and administrative overheads.
(ii) Calculation of the amount of factory overheads, administrative overheads and profit for each of the two jobs.
(iii) Using the above recovery rates fix the selling price of job 103. The additional data being:

Direct materials Rs. 24,000
Direct wages Rs. 20,000
Profit percentage on selling price12-½%

SOLUTION

(i) Let factory overhead recovery rate as percentage of direct wages be X and administrative overheads recovery rate as percentage of factory cost be Y.

Particulars	**Job 101**	**Job 102**
Direct material	54,000	37,500
Direct Wages	42,000	30,000
Prime Cost	**96,000**	**67,500**
Add: Factory Overhead (X% of direct wages)	42,000 x $\frac{X}{100}$ = 420X	30,000 x $\frac{X}{100}$ = 300X
Factory Cost	**96,000 + 420X**	**67,500 + 300X**
Add:- Admin Overhead (Y% of Factory Cost)	(96,000+420X) x $\frac{Y}{100}$	(67,500+300X) x $\frac{Y}{100}$
Total Cost	**(96,000+420X) x (1+$\frac{Y}{100}$)**	**(67,500+300X) x (1+$\frac{Y}{100}$)**
Add:- Profit	15,150 (166650 x $\frac{10}{110}$)	21,375 (128250 x $\frac{20}{120}$)
Sales	**1,66,650**	**1,28,250**

Eq. 1 **(96,000+420X) x (1+$\frac{Y}{100}$) = 151500**

Eq. 2 **(67,500+300X) x (1+$\frac{Y}{100}$) = 106875**

(96,000+420x) x (1 + $\frac{y}{100}$) = 166650 – 15150 = 151500 .....Eq 1

(67,500+300x) x (1 + $\frac{y}{100}$) = 128250 – 21375 = 106875.....Eq 2

On dividing equations we get,

$\frac{(96,000+420x) \text{ x } (1 + \frac{y}{100})}{(67,500+300x) \text{ x } (1 + \frac{y}{100})} = \frac{151500}{106875}$ = 1.417543859649122

On solving we get x = 60 and y = 25

Hence factory overheads to be recovered from customer is 60% of direct wages and office & administration overheads is 25% of works cost.

Following 2 equations can be formed as follows

(96,000+420x) x (1 + $\frac{y}{100}$) = 166650 – 15150 = 151500 .....Eq 1

(67,500+300x) x (1 + $\frac{y}{100}$) = 128250 – 21375 = 106875.....Eq 2

On dividing equation1 by Equation 2 we get,

$\frac{(96,000+420x) \text{ x } (1 + \frac{y}{100})}{(67,500+300x) \text{ x } (1 + \frac{y}{100})} = \frac{151500}{106875}$ = 1.417543859649122

$\frac{(96,000+420x)}{(67,500+300x)}$ = 1.417543859649122 (Take as it is - Don't Round Off – Otherwise answer shall be wrong)

(96000 + 420X) = (67500+300X) x 1.417543859649122
= (96000 + 420X) = (67500 x 1.417543859649122+300X x 1.417543859649122
= (96000 + 420X) = (67500 x 1.417543859649122+300X x 1.417543859649122
= (96000 + 420X) = 95684.21 + 425.26X
= 96000 – 95684.21 = 425.26X – 420X
= 315.79 = 5.26X
= Hence X = 60

On dividing Eq 1 by Eq 2 and after solving it, we get

X = 60 and Y = 25

(ii) Statement of jobs, showing amount of factory overheads, administrative overheads and profit

	Job 101 (Rs)	Job 102 (Rs)
Direct materials	54,000	37,500
Direct wages	42,000	30,000
Prime cost	**96,000**	**67,500**
Factory overheads 60% of direct wages	25,200	18,000
Factory cost	**1,21,200**	**85,500**

Administrative overheads 25% of factory cost	30,300	21,375
Total cost	**1,51,500**	**1,06,875**
Profit	15,150	21,375
Selling price	**1,66,650**	**1,28,250**

(iii) Selling price of Job 103

Particulars	**(Rs)**
Direct materials	24,000
Direct wages	20,000
Prime cost	**44,000**
Factory overheads (60% of Direct Wages)	12,000
Factory cost	**56,000**
Administrative overheads (25% of factory cost)	14,000
Total cost	**70,000**
Profit margin (balancing figure)	10,000
Selling price ($\frac{\text{Total cost}}{87.5\%}$)	**80,000**

Question 2

A machine shop cost centre contains three machines of equal capacities. To operate these three machines nine operators are required i.e. three operators on each machine. Operators are paid Rs.20 per hour. The factory works for fourty eight hours in a week which includes 4 hours set up time. The work is jointly done by operators. The operators are paid fully for the forty eight hours. In additions they are paid a bonus of 10 per cent of productive time. Costs are reported for this company on the basis of thirteen four-weekly period.

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available:

Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is Rs.52,000.

Maintenance and repairs per week per machine is Rs.60.

Consumable stores per week per machine are Rs.75.
Power : 20 units per hour per machine at the rate of 80 paise per unit. No power is used during set up hours.

Apportionment to the cost centre : Rent per annum Rs.5,400, Heat and Light per annum Rs.9,720, foreman's salary per annum Rs.12,960 and Other Miscellaneous expenditure per annum Rs.18,000
Required:

(i) Calculate the cost of running one machine for a four week period.
(ii) Calculate machine hour rate.

SOLUTION

Calculation of Effective machine hours

Particulars	Hours
Total Working hours (48 hours per week x 4 week)	192 hours
Less Unproductive hours SET UP TIME (4 hours per week x 4 week)	(16 hours)
Effective Working Hours	**176 hours**

Statement showing cost of running for one machine for a four-week period

Particulars	**Amount (Rs.)**
Fixed Charges	
Rent ($\frac{Rs.5400\ x\ 4\ weeks}{52\ weeks\ x\ 3\ machines)}$)	138.46
Heat & Light ($\frac{Rs.9720\ x\ 4\ weeks}{52\ weeks\ x\ 3\ machines)}$)	249.23
Forman's Salary ($\frac{Rs.12960\ x\ 4\ weeks}{52\ weeks\ x\ 3\ machines)}$)	332.30
Other Misc. Exp. $\frac{Rs.18000\ x\ 4\ weeks}{52\ weeks\ x\ 3\ machines)}$)	461.54
wages (48 hours x 4 weeks x 3 operators for 1 machine x Rs. 20)	11520
Bonus 10% of (44 hours x 4 weeks x 3 operators for 1 machine x Rs.20)	1056
Total Fixed Charges	**13757.54**
Running Charges	
Depreciation ($\frac{Rs.52{,}000\ x\ 10\%\ x\ \ 4\ weeks}{52\ weeks}$)	400
Repairs & maintenance (Rs. 60 x 4 weeks)	240
Consumable Stores (Rs. 75 x 4 weeks)	300
Power (176 hours x 20 units x Rs. 0.80)	2816
Total variable Charges	**3756**
Total Overhead Cost	**17513.54**

(i) Machine hour rate = $\frac{\text{Rs.}17513.54}{176\ \text{hrs}}$ = Rs. 99.51

Note:- it is assumed that power is consumed at all hours including set up time also.

Question 3

Gemini Enterprises undertakes three different jobs A, B and C. All of them require the use of a special machine and also the use of a computer. The computer is hired and the hire charges work out to Rs.4,20,000 per annum. The expenses regarding the machine are estimated as follows:
Rent for a quarter – Rs.17,500
Depreciation per annum – Rs. 2,00,000
Indirect charges per annum – Rs. 1,50,000
During the first month of operation the following details were taken from the job register:

	Job A	Job B	Job C
Number of hours the machine was used			
a) Without use of computer	600	900	-
b) With use of Computer	400	600	1000

You are required to COMPUTE the machine hour rate:

a) For the firm as a whole for the month when the computer was used and when the computer was not used.
b) For the individual jobs A, B and C.

Solution

Answer to Requirement (a)

Monthly Computer Hire Charges = Rs.420000 / 12 months = Rs.35,000

Other Monthly Overheads

- Rent (Rs.17500 / 3 months) – Rs.5833.34
- Dep. (Rs.200000 / 12 months) – Rs.16666.66
- Indirect Charges (Rs.150000/12 months) – Rs.12500

Hence Other monthly Overheads Charges = Rs.35,000

	Machine Hours	**Total Overheads**	**Machine Hour Rate**
With use of Computer	2000	Rs.35000 x 2000 hours / 3500 hours + Rs.35000 = 55000	55000 / 2000 Hours = Rs.27.50
Without use of Computer	1500	Rs.35000 x 1500 hours / 3500 hours = 15000	15000 / 1500 Hours = Rs.10
	3500		

Answer to Requirement (b)

	Rate per hour (Rs.)	Job A		Job B		Job C	
Overheads		**Hrs.**	**Rs.**	**Hrs.**	**Rs.**	**Hrs.**	**Rs.**
Without Computer	Rs.10	600	6000	900	9000	-	-
With Computer	Rs.27.50	400	11000	600	16500	1000	27500
Total		**1000**	**17000**	**1500**	**25500**	**1000**	**27500**
Machine Hour Rate			17.00		17.00		27.50

Question 4

A Ltd., manufactures two products A and B. The manufacturing division consists of two production departments P1 and P2 and two service departments S1 and S2. Budgeted overhead rates are used in the production departments to absorb factory overheads to the products. The rate of Department P1 is based on direct machine hours, while the rate of Department P2 is based on direct labour hours. In applying overheads, the pre-determined rates are multiplied by actual hours.

For allocating the service department costs to production departments, the basis adopted is as follows:

(i) Cost of Department S1 to Department P1 and P2 equally, and

(ii) Cost of Department S2 to Department P1 and P2 in the ratio of 2 : 1 respectively.

The following budgeted and actual data are available:

Annual profit plan data:

Factory overheads budgeted for the year:

Production Departments		**Service Departments**	
P1	P2	S1	S2
Rs.25,50,000	Rs.21,75,000	Rs.6,00,000	Rs.4,50,000

Budgeted output in units:
Product A 50,000; B 30,000.
Budgeted raw-material cost per unit:
Product A Rs. 120; Product B Rs. 150.
Budgeted time required for production per unit:
Department P1 : Product A : 1.5 machine hours
Product B : 1.0 machine hour
Department P2 : Product A : 2 Direct labour hours
Product B : 2.5 Direct labour hours
Average wage rates budgeted in Department P2 are:
Product A - Rs. 72 per hour and Product B – Rs. 75 per hour.
All materials are used in Department P1 only.
Actual data: (for the month of July, 2022)
Units actually produced: Product A: 4,000 units
Product B: 3,000 units
Actual direct machine hours worked in Department P1:
On product A- 6,100 hours, Product B- 4,150 hours.
Actual direct labour hours worked in Department P2:
on product A- 8,200 hours, Product B- 7,400 hours.

Cost Actually Incurred	**Product A**	**Product B**
Raw Materials	Rs.4,89,000	Rs.4,56,000
Wages	Rs.5,91,900	Rs.5,52,000
Overheads Department P1 Department P2	 Rs.2,31,000 S1 Rs.2,04,000 S2	 Rs.60,000 Rs.48,000

You are required to:
(i) COMPUTE the pre-determined overhead rate for each production department.
(ii) PREPARE a performance report for July, 2022 that will reflect the budgeted costs and actual costs.

Solution

(i) Computation of Pre-determined Overhead rates

	Prod. Depts.		Service Depts.	
	P1	P2	S1	S2
Budgeted FOH (Given)	Rs.25,50,000	Rs.21,75,000	Rs.6,00,000	Rs.4,50,000
OH of S1 distributed in P1&P2 in Equal Ratio	Rs.3,00,000	Rs.3,00,000	(Rs.6,00,000)	-
OH of S2 distributed in P1&P2 in 2:1 Ratio	Rs.3,00,000	Rs.1,50,000	-	(Rs.4,50,000)
Total	**Rs.31,50,000**	**Rs.26,25,000**	**-**	**-**
Budgeted Machine Hours P1 – 50000 units x 1.50 Hrs + 30000 units x 1 Hrs = 105000 P2 - 50000 units x 2 Hrs + 30000 units x 2.50 Hrs = 175000	105000 Hrs	175000 Hrs.		
Budgeted Machine hour Rate	Rs.30	Rs.15		

(ii) Performance Report for July 2022

	Budgeted (Rs.)	Actual (Rs.)
Raw Material in P1 A: 4000 units x Rs.120 B: 3000 units x Rs.150	 4,80,000 4,50,000	 4,89,000 4,56,000
Direct Labour Cost in P2 A: 4000 units x 2 Hrs. x Rs.72 B: 3000 units x 2.5 Hrs. x Rs.75	 5,76,000 5,62,500	 5,91,900 5,52,000
Overheads absorbed in P1 A: 4000 units x 1.5 Hrs. x Rs.30 B: 3000 units x 1 Hrs. x Rs.30	 1,80,000 90,000	 1,74,400 (6100 Hrs. x Rs.28.59) 1,18,649 (4150 Hrs. x Rs.28.59)
Overheads absorbed in P2 A: 4000 units x 2 Hrs. x Rs.15 B: 3000 units x 2.50 Hrs. x Rs.15	 1,20,000 1,12,500	 1,31,364 (8200 Hrs. x Rs.16.02) 1,18,649 (7400 Hrs. x Rs.16.02)
Total	**25,71,000**	**26,31,861**

Computation of Actual Overhead rates

	Prod. Depts.		Service Depts.	
	P1	**P2**	**S1**	**S2**
Actual FOH (Given)	231000	204000	60000	48000
OH of S1 distributed in P1&P2 in Equal Ratio	30000	30000	(60000)	-
OH of S2 distributed in P1&P2 in 2:1 Ratio	32000	16000	-	(48000)
Total	**293000**	**250000**	**-**	**-**
Actual Machine Hours P1 – 6100 Hrs + 4150 Hrs = 10250 Hrs. P2 - 8200 Hrs + 7400 Hrs = 15600 Hrs.	10250 Hrs.	15600 Hrs.		
Actual Machine hour Rate	**Rs.28.59**	**Rs.16.02**		

ACTIVITY BASED COSTING

Question 1

Family stores wants information about the profitability of individual product lines: Soft Drinks, Fresh produce and Packaged food. Family store provides the following data for the year 2002-03 each product line:

Particulars	Soft Drinks	Fresh Produce	Packaged food
Revenues	Rs. 7,93,500	Rs. 21,00,000	Rs. 12,09,000
Cost of goods sold	Rs. 6,00,000	Rs. 15,00,000	Rs. 9,00,000
Cost of bottles returned	Rs.12,000	Rs. 0	Rs. 0
Number of Purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000

Family stores also provide the following information for the year 2002-03:

Activity	Description of activity	Total Cost (rs)	Cost allocation base
Bottles returned	Returning of empty bottles	12,000	Direct tracing to soft drink lines
Ordering	Placing of orders for purchases	1,56,000	1,560 purchase orders
Delivery	Physical delivery & receipt of goods	2,52,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and ongoing restocking	1,72,800	8,640 hours of shelf stocking time
Customer support	Assistance proved to customers including check-out	3,07,200	15,36,000 items sold

Required:

(i) Family stores currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. Calculate the operating income & operating income as a % of revenue of each product line.

(ii) If family stores allocates support cost (all cost other than cost of goods sold) to product lines using an activity based costing system. Calculate the operating income & operating income as a % of revenue of each product line.

Solution:

(i) As given in question, suppose cost is allocated to products on the basis of cost of goods sold.
(It is also assumed that cost of goods sold does not include support cost **(or)**support cost is part of Selling & distribution overhead)

Support cost to cost of goods sold(%) = $\frac{\text{Total Support Cost}}{\text{Total cost of goods sold}}$ X 100

= $\frac{\text{Rs.12,000+Rs.1,56,000+Rs.2,52,000+Rs.1,72,800+Rs.3,07,200}}{\text{Rs.6,00,000+Rs.15,00,000+Rs.9,00,000}}$ X 100

= 30%

Statement of Operating Income

Particulars	Soft Drinks	Fresh Produce	Packaged food
Revenues	7,93,500	21,00,000	12,09,000
(-) Cost of goods sold	(6,00,000)	(15,00,000)	(9,00,000)
(-) Support Cost (30% of Cost of goods sold)	(1,80,000)	(4,50,000)	(2,70,000)
Net Operating Income	**13,500**	**1,50,000**	**39,000**
Net Operating Income as a % of revenue	1.70%	7.14%	3.225%

(i) Statement of cost (pool)

Cost	Amount	Basis	No. of Activity	Cost per Activity
Ordering	1,56,000	No. of purchase orders	1,560	100 per order
Delivery	2,52,000	No. of deliveries	3,150	80 per delivery
Shelf stocking	1,72,800	hours of shelf stocking time	8,640 hrs	20 per hour
Customer support	3,07,200	items sold	15,36,000	0.20 per item
	8,88,000			

Statement of cost

Particulars	Soft Drinks	Fresh Produce	Packaged food
Revenues	7,93,500	21,00,000	12,09,000
(-) Cost of goods sold	(6,00,000)	(15,00,000)	(9,00,000)
(-) Bottle returned	(12,000)	-	-
(-) Ordering (360: 840: 360)	(36,000)	(84,000)	(36,000)
(-) Delivery (300: 2190: 660)	(24,000)	(1,75,200)	(52,800)
(-) Shelf Stocking (540: 5400: 2700)	(10,800)	(1,08,000)	(54,000)
(-) Customer Support (126000: 1104000: 306000)	(25,200)	(2,20,800)	(61,200)
Net Operating Income	**85,500**	**12,000**	**105,000**
Net Operating Income as a % of revenue	10.78%	0.57%	8.68%

Question 2

A bank offers three products, viz., deposits, Loans and Credit Cards. The bank has selected 4 activities for a detailed budgeting exercise, following activity based costing methods.

The bank wants to know the product wise total cost per unit for the selected activities, so that prices may be fixed accordingly.

The following information is made available to formulate the budget:

	Activity	Present Cost (Rs)	Estimation for the Budget Period
(i)	ATM Service		
	(a) Machine Maintenance	4,00,000	(all fixed, no change)
	(b) Rents	2,00,000	(fully fixed, no change)
	(c) Currency Replenishment Cost	1,00,000	(expected to double during budget period)
		7,00,000	(This activity is driven by no. of ATM transaction)
(ii)	Computer Processing	5,00,000	(Half this amount is fixed and no change is expected) (The variable portion is expected to increase to three times the current level) This activity is driven by the number of Computer transactions.
	Issuing Statement	18,00,000	Presently 3 lacs statement are made. In the budget period, 5 lac statements are expected. For every increase of one lac statement, one lacs rupees is the budget increase (this activity is driven by the number of statements).
	Customer Inquiries	2,00,000	Estimated to increase by 80% during the budget period. (This activity is driven by telephone minutes).

The activity drivers and their budgeted quantifies are given below:

	Deposits	Loans	Credit Cards
No. of ATM Transactions	1.50.000	-	50,000
No. of Computer Processing Transactions	15,00,000	2,00,000	3,00,000
No. of Statements to be issued	3,50,000	50,000	1,00,,000
Telephone Minutes	3,60,000	1,80,000	1,80,000

The bank budgets a volume of 58,600 deposit accounts, 13,000 loan accounts, and 14,000 Credit Card Accounts.

Required:

(i) Calculate the budgeted rate for each activity.
(ii) Prepare the budgeted cost statement activity wise.
(iii) Find the budgeted product cost per account for each product using (i) and (ii) above.

Solution

Working Note 1: Calculation of Activity cost in budgeted period:

ATM Service:

Particulars	Rs.
Machine maintenance	400000
Rent	200000
Currency cost (Rs. 100000 x 2)	200000
Total	**800000**

Computer processing:-

Particulars	Rs.
Fixed	250000
Variable (Rs. 250000 x 3)	750000
Total	**1000000**

Issuing statement

Particulars	Rs.
3 Lac statements	1800000
1 Lac statements	100000
1 Lac statements	100000
Total	**2000000**

Computer enquiries = 200000 x 1.80 = Rs. 360000

Statement of cost Pool (Activity Based Costing)

Overhead	**Amount**	**Basis**	**No. of Activity**	**Cost per Activity (Rs)**
ATM Service	800000	No. of ATM services	200000	4.00
Computer processing	1000000	No. of computer processing	2000000	0.50
Issuing statements	2000000	No. of statements	500000	4.00
Customers enquiries	360000	Telephone minutes	720000	0.50

Statement of cost (Activity Based Costing)

Particulars	**Deposit A/cs**	**Loan A/cs**	**Credit A/cs**
ATM Service (150000 : 0 : 50000)	600000	--	200000
Computer processing (15 lac : 2 lac : 3 lac)	750000	100000	150000
Issuing statements (350000 : 50000 : 100000)	1400000	200000	400000
Customers enquiries (360000 : 180000 : 180000)	180000	90000	90000
Total Cost	**2930000**	**390000**	**840000**
Units	58600	13000	14000
Cost per unit	50	30	60

Question 3

BABYSOFT is a global brand created by Bio-organic Ltd. The company manufactures three ranges of beauty soaps i.e. BABYSOFT- Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond. The budgeted costs and production for the month of December, 2020 are as follows:

	BABYSOFT- Gold		BABYSOFT- Pearl		BABYSOFT- Diamond	
Production of soaps (Units)	4,000		3,000		2,000	
Resources per Unit:	Qty	Rate	Qty	Rate	Qty	Rate
- Essential Oils	60 ml	Rs. 200 / 100 ml	55 ml	Rs. 300 / 100 ml	65 ml	Rs. 300 / 100 ml
- Cocoa Butter	20 g	Rs. 200 / 100 g	20 g	Rs. 200 / 100 g	20 g	Rs. 200 / 100 g
- Filtered Water	30 ml	Rs. 15 / 100 ml	30 ml	Rs. 15 / 100 ml	30 ml	Rs. 15 / 100 ml
- Chemicals	10 g	Rs. 30 / 100 g	12 g	Rs. 50 / 100 g	15 g	Rs. 60 / 100 g
- Direct Labour	30 minutes	Rs. 10 / hour	40 minutes	Rs. 10 / hour	60 minutes	Rs. 10 / hour

Bio-organic Ltd. followed an Absorption Costing System and absorbed its production overheads, to its products using direct labour hour rate, which were budgeted at Rs. 1,98,000.

Now, Bio-organic Ltd. is considering adopting an Activity Based Costing system. For this, additional information regarding budgeted overheads and their cost drivers is provided below:

Particulars	(Rs.)	Cost drivers
Forklifting cost	58,000	Weight of material lifted
Supervising cost	60,000	Direct Labour hours
Utilities	80,000	Number of Machine operations

The number of machine operators per unit of production are 5, 5, and 6 for BABYSOFT- Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond respectively.

(Consider (i) Mass of 1 litre of Essential Oils and Filtered Water equivalent to 0.8 kg and 1 kg respectively (ii) Mass of output produced is equivalent to the mass of input materials taken together.)

You are requested to:

(i) PREPARE a statement showing the unit costs and total costs of each product using the absorption costing method.

(ii) PREPARE a statement showing the product costs of each product using the ABC approach.

(iii) STATE what are the reasons for the different product costs under the two approaches?

Solution

(i) Statement showing unit cost under absorption costing method

Particulars	**BABYSOFTGold (Rs.)**	**BABYSOFTPearl (Rs.)**	**BABYSOFTDiamond (Rs.)**
DMC	167.50	215.50	248.50
DLC	5.00 (Rs.10 x 30/60)	6.67 (Rs.10 x 40/60)	10.00 (Rs.10 x 60/60)
Prod. Overheads	16.50 (Rs.33 x 30/60)	22.00 (Rs.33 x 30/60)	33.00 (Rs.33 x 60/60)
Unit Cost	**189.00**	**244.17**	**291.50**
Units	4000	3000	2000
Total Cost	**756000**	**732510**	**583000**

Calculation of DMC

Particulars	**BABYSOFTGold (Rs.)**	**BABYSOFTPearl (Rs.)**	**BABYSOFTDiamond (Rs.)**
Essential oils	120 (60 ml x Rs.200 / 100 ml)	165 (55 ml x Rs.300 / 100 ml)	195 (65 ml x Rs.300 / 100 ml)
Cocoa Butter	40 (20 g x Rs.200 / 100 g)	40 (20 g x Rs.200 / 100 g)	40 (20 g x Rs.200 / 100 g)
Filtered water	4.50 (30 ml x Rs.15 / 100 ml)	4.50 (30 ml x Rs.15 / 100 ml)	4.50 (30 ml x Rs.15 / 100 ml)
Chemicals	3.00 (10 g x Rs.30 / 100 g)	6.00 (12 g x Rs.50 / 100 g)	9.00 (15 g x Rs.60 / 100 g)
Total DMC	**167.50**	**215.50**	**248.50**

Calculation of Prod. Overhead Rate

Particulars	**BABYSOFTGold (Rs.)**	**BABYSOFTPearl (Rs.)**	**BABYSOFTDiamond (Rs.)**
Units Produced	4000	3000	2000
Direct Labour Hours per unit	30/60 = 0.50 Hour	40/60 = 0.66 hours	60/60 = 1 Hour
Direct Labour Hours (Total)	2000 Hrs	2000 Hrs	2000 Hrs

Prod. OH rate = Total Prod. OH / Total Labour Hours = Rs.1,98,000 / 6000 Hours = Rs.33 per hour

(ii) Statement showing cost per activity

Overhead	**Amount**	**Basis**	**No. of Activities**	**Cost per activity**
Forklifting cost	58,000	*Weight of material lifted*	9,84,000 grams (WN1)	Rs. 0.06 per gram
Supervising cost	60,000	*Direct labour hours*	6,000 hours	Rs. 10 per labour hour
Utilities	*80,000*	*Number of Machine operations*	47,000 machine operations	Rs. 1.70 per machine operations

Working Note – 1

Particulars	**BABYSOFT Gold**	**BABYSOFT Pearl**	**BABYSOFT Diamond**	**Total**
Units	4000	3000	2000	
Weight per unit (grams)	108 {(60×0.8)+20+ 30+10}	106 {(55×0.8)+20 +30+12}	117 {(65×0.8)+20+ 30+15}	
Total weight (grams)	4,32,000	3,18,000	2,34,000	9,84,000
Direct labour (Hours)	30/60	40/60	60/60	
Direct labour Hours	2000	2000	2000	6000
Machine operations per unit	5	5	6	
Total Operations	**20,000**	**15,000**	**12,000**	**47,000**

As given in Question for Essential Oil

1 Litre = 0.80 Kg
1000 ml = 0.80 x 1000 Gram
1000 ml = 800 gram
1 ml = 800/1000 = 0.80 Gram

As given in Question for Filtered Water

1 Litre = 1 Kg
1000 ml = 1000 Gram
1000 ml = 1000 gram
1 ml = 1000/1000 = 1 Gram

Statement showing unit Cost

Particulars	**BABYSOFT Gold**	**BABYSOFT Pearl**	**BABYSOFT Diamond**
DMC	167.50	215.50	248.50
DLC	5.00 (Rs.10 x 30/60)	6.67 (Rs.10 x 40/60)	10.00 (Rs.10 x 60/60)
Overheads			
Forklifting	6.48 (0.06 x 108)	6.36 (0.06 x 106)	7.02 (0.06 x 117)
Supervising	5.00 (10x30/60)	6.67 (10x40/60)	10.00 (10x60/60)
Utilities	8.50 (1.70 x 5)	8.50 (1.70 x 5)	10.20 (1.70 x 6)
Unit Cost	**192.48**	**243.70**	**285.72**
Units	4000	3000	2000
Total Cost	**7,69,920**	**7,31,100**	**5,71,440**

Comments: The difference in the total costs under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more accurate

COST SHEET

QUESTION 1

Arnav Inspat Udyog Ltd. has the following expenditures for the year ended 31st March:

Sl. No.		Amount (Rs.)	Amount (Rs.)	Cost Head
(i)	Raw materials purchased		100000000	
(ii)	GST paid on the above purchases @18% (eligible for input tax credit)		18000000	
(iii)	Freight inward		1120600	
(iv)	Wages paid to factory workers		2920000	
(v)	Contribution made towards employees' PF & ESIS		360000	
(vi)	Production bonus paid to factory workers		290000	
(vii)	Royalty paid for production		172600	
(viii)	Amount paid for power & fuel		462000	
(ix)	Amount paid for purchase of moulds and patterns (life is equivalent to two years production)		896000	
(x)	Job charges paid to job workers		812000	
(xi)	Stores and spares consumed		112000	
(xii)	Depreciation on:			
	- Factory building	84000		
	- Office building	56000		
	- Plant & Machinery	126000		
	- Delivery vehicles	86000	352000	
(xiii)	Salary paid to supervisors		126000	
(xiv)	Repairs & Maintenance paid for:			
	- Plant & Machinery	48,000		
	- Sales office building	18000		
	- Vehicles used by directors	19600	85600	
(xv)	Insurance premium paid for:			
	- Plant & Machinery	31200		
	- Factory building	18100		
	- Stock of raw materials & WIP	36000	85300	
(xvi)	Expenses paid for quality control check activities		19600	
(xvii)	Salary paid to quality control staffs		96200	
(xviii)	Research & development cost paid improvement in production process		18200	
(xix)	Expenses paid for pollution control and engineering & maintenance		26600	
(xx)	Expenses paid for administration of factory work		118600	
(xxi)	Salary paid to functional mangers:			
	- Production control	960000		
	- Finance & Accounts	918000		
	- Sales & Marketing	1012000	2890000	
(xxii)	Salary paid to General Manager		1256000	
(xxiii)	Packing cost paid for:			
	- Primary packing necessary to maintain quality	96000		

	- For re-distribution of finished goods	112000	208000	
(xxiv)	Interest and finance charges paid (for usage of non-equity fund)		720000	
(xxv)	Fee paid to auditors		180000	
(xxvi)	Fee paid to legal advisors		120000	
(xxvii)	Fee paid to independent directors		220000	
(xxviii)	Performance bonus paid to sales staffs		180000	
(xxix)	Value of stock as on 1st April, 20X7:			
	- Raw materials	1800000		
	- Work-in-process	920000		
	- Finished goods	1100000	3820000	
(xxx)	Value of stock as on 31st March, 20X8:			
	- Raw materials	960000		
	- Work-in-process	870000		
	- Finished goods	1800000	3630000	

Amount realized by selling of scrap and waste generated during manufacturing process – Rs.86,000/-

From the above data you are requested to PREPARE Statement of cost for Arnav Ispat Udyog Ltd. for the year ended 31st March, 20X8, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

Solution Statement of Cost of Arnav Ispat Udyog Ltd. for the year ended 31st March

Sl. No.	**Particulars**	**Amount (Rs.)**	**Amount (Rs.)**
(i)	Material Consumed:		
	- Raw materials purchased	100000000	
	- Freight inward	1120600	
	Add: Opening stock of raw materials	1800000	
	Less: Closing stock of raw materials	(960000)	**101960600**
(ii)	Direct employee (labour) cost:		
	- Wages paid to factory workers	2920000	
	- Contribution made towards employees' PF & ESIS	360000	
	- Production bonus paid to factory workers	290000	**3570000**
(iii)	Direct expenses:		
	- Royalty paid for production	172600	
	- Amount paid for power & fuel	462000	
	- Amortised cost of moulds and patterns	448000	
	- Job charges paid to job workers	812000	**1894600**
	Prime Cost		**107425200**
(iv)	Works/ Factory overheads:		
	- Stores and spares consumed	112000	
	- Depreciation on factory building	84000	
	- Depreciation on plant & machinery	126000	
	- Salary paid to supervisors	126000	
	- Repairs & Maintenance paid for plant & machinery	48000	
	- Insurance premium paid for plant & machinery	31200	
	- Insurance premium paid for factory building	18100	

	- Insurance premium paid for stock of raw materials & wip	36000	
	- Expenses paid for pollution control and engineering & maintenance	26600	**607900**
	Gross factory cost		**108033100**
	Add: Opening value of W-I-P		920000
	Less: Closing value of W-I-P		(870000)
	Factory Cost		**108083100**
(v)	Quality control cost:		
	- Expenses paid for quality control check activities	19600	
	- Salary paid to quality control staffs	96200	**115800**
(vi)	Research & development cost paid improvement in production process		**18200**
(vii)	Administration cost related with production:		
	- Expenses paid for administration of factory work	118600	
	- Salary paid to Production control manager	960000	**1078600**
(viii)	Less: Realisable value on sale of scrap and waste		(86000)
(ix)	Add: Primary packing cost		96000
	Cost of Production		**109305700**
	Add: Opening stock of finished goods		1100000
	Less: Closing stock of finished goods		(1800000)
	Cost of Goods Sold		**108605700**
(x)	Administrative overheads:		
	- Depreciation on office building	56000	
	- Repairs & Maintenance paid for vehicles used by directors	19600	
	- Salary paid to Manager- Finance & Accounts	918000	
	- Salary paid to General Manager	1256000	
	- Fee paid to auditors	180000	
	- Fee paid to legal advisors	120000	
	- Fee paid to independent directors	220000	**27,69,600**
(xi)	Selling overheads:		
	- Repairs & Maintenance paid for sales office building	18000	
	- Salary paid to Manager- Sales & Marketing	1012000	
	- Performance bonus paid to sales staffs	180000	**1210000**
(xii)	Distribution overheads:		
	- Depreciation on delivery vehicles	86000	
(xiii)	- Packing cost paid for re-distribution of finished goods	112000	**198000**
	Interest and finance charges paid		**720000**
	Cost of Sales		**113503300**

Notes: GST paid of purchase of raw materials would not be part of cost of materials as it is eligible for input credit.

INTEGRATED AND NON-INTEGRADTED ACCOUNTS

Question 1

At the beginning of a month, the opening balances in cost ledger were:

			Rs. (in lakhs)
Stores Ledger Control Account			80
Work-in-Progress Control Account			20
Finished Goods Control Account			430
Building Construction Account			10
Cost Ledger Control Account			540
During the month, the following transactions took place:			
Materials	-	Purchased	40
		Issued to production	50
		Issued to general maintenance	6
		Issued to building construction	4
Wages	-	Gross wages paid	150
		Indirect wages	40
		For building construction	10
Works Overheads	-	Actual amount incurred (excluding items shown above)	160
		Absorbed in building construction	20
		Under absorbed	8
Royalty paid			5
Selling, distribution and administration overheads			25
Sales			450

At the end of the month, the stock of raw material and work-in-progress was Rs.55 lakhs and Rs.25 lakhs respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales. Prepare the relevant control accounts to record the above transactions in the cost ledger of the company.

Solution - Following Table is for understanding how to relate concept with journal entries

	Rs. in Lakh	Concept No.	Debit	Credit
Stores Ledger Control Account	80	9	Opening bal. shown on Dr. side	
Work-in-Progress Control Account	20	9	Opening bal. shown on debit side	
Finished Goods Control Account	430	9	Opening bal. shown on debit side	

Building Construction Account	10	9	Opening bal. shown on debit side	
Cost Ledger Control Account	540	9		Closing bal. shown on credit side
Materials :-				
Purchased	40	5	Stores ledger control A/c	GLA A/c
Issued to production	50	5	WIP Ledger control A/c	Stores ledger control A/c
Issued to general maintenance	6	5	Factory OH control A/c	Stores ledger control A/c
Issued to building construction	4	5	Building construction A/c	Stores ledger control A/c
Wages				
Gross Wages Paid	150	6	Wages control A/c	GLA A/c
Indirect wages	40	6	Factory OH control A/c	Wages control A/c
For building construction	10	6	Building construction A/c	Wages control A/c
Works Overheads				
Actual amount incurred (excluding items shown above)	160	8	Factory OH control A/c	GLA A/c
Absorbed in building construction	20	8	Building construction A/c	Factory OH control A/c
Under absorbed	8	C – 4 Option – 2	Costing P&L A/c	Factory OH control A/c
Royalty paid	5	7 (Net Entry of Paid and Transferred)	WIP Ledger control A/c	GLA A/c
Selling, distribution and administration overheads	25	8	Selling & Distribution OH A/c	GLA A/c
Sales	450	3	GLA A/c	Costing P&L A/c
At the end of the month, the stock of raw material and work-in-progress was Rs.55 lakhs and Rs.25 lakhs respectively.		9		Closing balance of stores & WIP on credit side

The loss arising in the raw material account is treated as factory overheads.		10 (Normal loss)	Factory OH control A/c	Stores ledger control A/c
Company's gross profit margin is 20% on sales. Cost of goods sold = Sales – Gross profit = 450 Lakh – 450 Lakh x 20% = 360 Lakh	360	9	Cost of Sales A/c	FG Ledger Control A/c

All Figures are in Lakhs.

Stores ledger control A/c

Particulars	Amt	Particulars	Amt
To bal. b/d	80	By WIP Ledger control A/c (Material)	50
To GLA A/c	40	By works OH control A/c	6
		By building construction A/c	4
		By works OH control A/c**(DOB)**	5
		By bal. c/d	55
	120		**120**

Note:- DOB as Rs. 5 lakh as normal loss of material as per concept No. 10.

Wages control A/c

Particulars	Amt	Particulars	Amt
To GLA A/c	150	By WIP Ledger control A/c**(DOB)**	100
		By works OH control A/c	40
		By building construction A/c	10
	150		**150**

Note:- DOB Rs. 100 Lakh as per concept No. 6

Works overhead control A/c

Particulars	Amt	Particulars	Amt
To stores ledger control A/c	6	By WIP Ledger control A/c**(DOB)**	183
To stores ledger control A/c (loss)	5	By costing P&L A/c (Under absorbed)	8
To wages control A/c	40	By building construction A/c	20
To GLA A/c	160		
	211		**211**

Note:- DOB Rs. 183 Lakh as per concept No. 8 (Recovered OH)

WIP Ledger control A/c

Particulars	Amt	Particulars	Amt
To bal. b/d	20	By FG ledger control A/c**(DOB)**	333
To stores ledger control A/c	50	By bal. c/d	25
To wages control A/c	100		
To works OH control A/c	183		
To GLA A/c - Royalty)	5		
	358		**358**

Note:- DOB Rs. 333 Lakh as per concept No. 2 (TF from factory to warehouse)

FG Ledger control A/c

Particulars	Amt	Particulars	Amt
To bal. b/d	430	By cost of Sales A/c	360
To WIP ledger control A/c	333	By balance c/d**(DOB)**	403
	763		**763**

Note:- DOB as Rs. 403 Lakh as per concept No. 9 closing balance of FG.

Selling OH control A/c

Particulars	Amt	Particulars	Amt
To GLA A/c	25	By cost of Sales A/c (fully recovered)**(DOB)**	25

Note:- DOB Rs. 25 Lakh as per concept No. 8 (Recovered OH amount)

Cost of Sales A/c

Particulars	Amt	Particulars	Amt
To FG Ledger control A/c	360	By costing P&L A/c**(DOB)**	385
To selling OH control A/c	25		
	385		**385**

Note:- DOB Rs. 385 Lakh as per concept No. 2 (TF of Actual cost of Sales to Costing P&L A/c)

Costing P&L A/c

Particulars	Amt	Particulars	Amt
To cost of sales A/c	385	By GLA (Sales)	450
To works OH control A/c	8		
To GLA A/c (Net Profit) **(DOB)**	57		
	450		**450**

Note:- DOB as Rs. 57 Lakh as net profit.

GLA A/c

Particulars	Amt	Particulars	Amt
To costing P&L A/c	450	By bal. b/d	540
To building construction A/c	44	By stores ledger control A/c	40
To bal. c/d**(DOB)**	483	By wages control A/c	150
		By works OH control A/c	160
		By WIP Ledger control A/c (Royalty)	5
		By selling OH control A/c	25
		By costing P&L A/c(Net Profit)	57
	977		**977**

Note:- DOB Rs. 483 Lakh as closing balance of GLA A/c.

Building construction A/c

Particulars	Amt	Particulars	Amt
To bal. b/d	10	By GLA A/c (transfer)**(DOB)**	44
To stores ledger control A/c	4		
To wages control A/c	10		
To works OH control A/c	20		
	44		**44**

Note:- All Total of building construction A/c transferred to GLA A/c to close

Trial balance

Particulars	Dr.	Cr.
Stores ledger control A/c	55	
WIP Ledger control A/c	25	
FG Ledger control A/c	403	
GLA A/c		483

Question 2

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff for the month of January:

Incomplete Ledger Entries:

Material Control A/c

	(Rs.)		(Rs.)
To Balance b/d	32,000		

Work-in-process Control A/c

	(Rs.)		(Rs.)
To Balance b/d	9,200	By Finished Goods Control A/c	1,51,000

Payables (Creditors) A/c

	(Rs.)		(Rs.)
To Balance c/d	19,200	By Balance b/d	16,400

Manufacturing Overheads Control A/c

	(Rs.)		(Rs.)
To Bank A/c (Amount spent)	29,600		

Finished Goods Control A/c

	(Rs.)		(Rs.)
To Balance b/d	24,000	By Balance c/d	30,000

Additional Information:

(1) The bank-book showed that Rs. 89,200 have been paid to creditors for raw-material.

(2) Ending inventory of work-in-process included materials of Rs. 5,000 on which 300 direct labour hours have been booked against wages and overheads.

(3) The job card showed that workers have worked for 7,000 hours. The wage rate is Rs. 10 per labour hour.

(4) Overhead recovery rate was Rs. 4 per direct labour hour. You are required to COMPLETE the above accounts in the cost ledger of the company.

Solution

	Amount	**Entry**
Material Control A/c – Bal. B/d Given	32000	Show it on debit side of Material Control A/c.
WIP – Bal. B/d Given	9200	Show it on debit side of WIP A/c.
WIP – Finished goods shown on Credit Side	151000	FG A/c Dr. 151000 To WIP Control A/c 151000
Creditors – Bal. c/d Given	19200	Show it on credit side of creditor A/c
Creditors – Bal. b/d Given	16400	Show it on debit side of creditor A/c
Mfd. OH – Amount Spent	29600	F. OH A/c Dr. 29600 To Bank 29600
FG – Bal. b/d and c/d given		Show as debit & credit of FG A/c
The bank-book showed that Rs. 89,200 have been paid to creditors for raw-material	89200	Creditors A/c Dr. 89200 To Bank 89200
Ending inventory of work-in-process included materials of Rs. 5,000 on which 300 direct labour hours have been booked against wages and overheads.		It is Closing WIP & will be shown on credit side of WIP A/c. Cost of closing WIP = Rs.5000 + 300 Hours x Rs.10 + 300 Hours x Rs.4 = Rs.9200
The job card showed that workers have worked for 7,000 hours. The wage rate is Rs. 10 per labour hour.	7000 x 10 = 70000	Wages Control A/c Dr. 70000 To Bank A/c 70000 WIP Control A/c Dr. 70000 To Wages Control A/c 70000
Overhead recovery rate was Rs. 4 per direct labour hour	7000 x 4 = 28000	F. OH A/c Dr. 28000 To Bank A/c 28000 (Above Entry shall not be made since Question earlier given accurate information on this) WIP Control A/c Dr. 28000 To F. OH A/c 28000

Creditors A/c

Particulars	(Rs.)	Particulars	(Rs.)
To Bank	89200	By bal. B/d	16400
To Bal. C/d	19200	By Material Purchased (balancing Diff.)	92000
	108400		**108400**

SLC A/c Dr. 92000
To Creditors A/c 92000
(Being material purchased)

WORK-IN-PROGRESS ACCOUNT

Particulars	(Rs.)	Particulars	(Rs.)
To Bal. B/c	9200	By FG A/c	151000
To Wages Control	70000	By Bal. C/d	9200
To Factory Overheads	28000		
To Material (Balancing Figure)	53000		
	160200		**160200**

MATERIAL CONTROL ACCOUNT

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	32000	By WIP	53000
To Creditors	92000	By Balance C/D (Balancing Diff.)	71000
	124000		**124000**

Manufacturing OH ACCOUNT

Particulars	Rs.	Particulars	Rs.
To Bank	29600	By WIP	28000
		By Costing P&L (Under recovery OH)	1600
	29600		**29600**

FINISHED GOODS ACCOUNT

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	24000	By Cost of Sales (Balancing Figure)	145000
To WIP	151000	By Bal. C/d	30000
	175000		**175000**

Question 3

The following Incomplete Accounts are furnished to you for the month ended 31st October:

Stores Ledger Control Account

01-10-2022	To Balance	Rs.54,000

Work in Process Control Account

01-10-2022	To Balance	Rs.6,000

Finished Goods Control Account

01-10-2022	To Balance	Rs.75,000

Factory Overheads Control Account

Total Debits for October, 2022	Rs.54,000

Factory Overheads Applied Account

Cost of goods sold Account

Creditor for Purchases Account

01-10-2022	By Balance	Rs.30,000

Additional information:

(i) The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 2022 is Rs. 6,75,000 and the budget of direct labour hours is 4,50,000.
(ii) The balance in the account of creditors for purchases on 31.10.2022 is Rs.15,000 and the payments made to creditors in October, 2022 amount to Rs. 1,05,000
(iii) The finished goods inventory as on 31st October, 2022 is Rs. 66,000.
(iv) The cost of goods sold during the month was Rs. 1,95,000.
(v) On 31st October, 2022 there was only one unfinished job in the factory. The cost records show that Rs. 3,000 (1,200 direct labour hours) of direct labour cost and Rs. 6,000 of direct material cost had been charged
(vi) A total of 28,200 direct labour hours were worked in October, 2022. All factory workers earn same rate of pay.
(vii) All actual factory overheads incurred in October, 2022 have been posted.

You are required to FIND:

(a) Materials purchased during October, 2022.
(b) Cost of goods completed in October, 2022.
(c) Overheads applied to production in October, 2022.
(d) Balance of Work-in-Process Control A/c on 31st October, 2022.
(e) Direct Materials consumed during October, 2022.
(f) Balance of Stores Ledger Control Account on 31st October, 2022.
(g) Over absorbed or under absorbed overheads for October, 2022.

Solution

	Amount	**Entry**
SLC – Opening Bal. Given	54000	Show on debit side of SLC A/c
WIP – Opening Bal. given	6000	Show on debit side of WIP A/c
FG – Opening Bal. Given	75000	Show on debit side of FG A/c
Factory Overhead – Total Debits Given	45000	F. OH Control A/c Dr. 45000 To Bank 45000
Creditors – Opening Bal. Given	30000	Show on Credit side of Creditor A/c
The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 2022 is Rs. 6,75,000 and the budget of direct labour hours is 4,50,000.		Overhead Recovery Rate = Rs.675000/450000 Hours = Rs.1.50 per hour
The balance in the account of creditors for purchases on 31.10.2022 is Rs.15,000 and the payments made to creditors in October, 2022 amount to Rs. 1,05,000		Material purchased = Payment made + Closing Bal. – Opening Bal. = 105000 + 15000 – 30000 = 90000 SLC A/c Dr. 90,000 To Creditor 90,000

The finished goods inventory as on 31st October, 2022 is Rs. 66,000 and The cost of goods sold during the month was Rs. 1,95,000		FG Produced (At Cost) = Cos of goods sold + Closing FG – Opening FG = 195000 + 66000 – 75000 = 186000 FG A/c Dr. 186000 To WIP 186000
On 31st October, 2022 there was only one unfinished job in the factory. The cost records show that Rs. 3,000 (1,200 direct labour hours) of direct labour cost and Rs. 6,000 of direct material cost had been charged.		Direct Wage Rate = Rs.3000/1200 Hour = Rs.2.50 per labour hour Closing WIP = 3000 + 6000 + 1200 Hour x Rs.1.50 = 10800
A total of 28,200 direct labour hours were worked in October, 2022. All factory workers earn same rate of pay.		Direct Wages Charged = 28200 Hour x Rs.2.50 = Rs.70500 WIP A/c Dr. 70500 To Wages Control A/c 70500 Overheads charged to Prod. = 28200 Hour x Rs.1.50 = Rs.42300 WIP A/c Dr. 42300 To Factory Overhead 42300

(a) Materials purchased during October, 2022 = Rs.90,000 (Refer above Working Note)
(b) Cost of goods completed in October, 2022 = Rs.1,86,000 (Refer above Working Note)
(c) Overheads applied to production in October, 2022 = Rs.42300 (Refer above Working Note)
(d) Balance of Work-in-Process Control A/c on 31st October, 2022 = Rs.10800 (Refer above Working Note)
(e) Direct Materials consumed during October, 2022 = RS.78000

WIP Control ACCOUNT

Particulars	(Rs.)	Particulars	(Rs.)
To Balance b/d	6000	By FG	186000
To Wages Control	70500	By Balance C/D	10800
To Factory OH	42300		
To SLC (Material Consumed) – Balancing Figure	78000		
	196800		**196800**

(f) Balance of Stores Ledger Control Account on 31st October, 2022 = Rs.66000

SLC ACCOUNT

Particulars	(Rs.)	Particulars	(Rs.)
To Bal. B/d	54000	By WIP	78000
To creditor	90000	By Bal. C/d	66000
	144000		**144000**

(g) Over absorbed or under absorbed overheads for October, 2022 = Rs.2700

Factory Overhead ACCOUNT

Particulars	(Rs.)	Particulars	(Rs.)
To Bank	45000	By WIP	42300
		By Costing P&L A/c	66000
	144000		**144000**

RECONCILIATION OF COST & FINANCIAL PROFIT

QUESTION 1

A manufacturing company has disclosed net loss of Rs. 48,700 as per their cost accounting records for the current year ended 31st March. However their financial accounting records disclosed net profit of Rs.35,400 for the same period. A scrutiny of data of both the sets of books of accounts revealed the following information:

	Particulars	*Rs.*
(i)	Factory overheads under absorbed	30,500
(ii)	Administrative overheads over absorbed	65,000
(iii)	Depreciation charged in financial accounts	2,25,000
(iv)	Depreciation charged in cost accounts	2,70,000
(v)	Income – tax provision	52,400
(vi)	Transfer fee (credited in financial accounts)	10,200
(vii)	Obsolescence loss charged in financial accounts	20,700
(viii)	Notional rent of own premises charged in cost accounts	54,000
(ix)	**Value of opening stock**:	
	(a) in cost accounts	1,38,000
	(b) in financial accounts	1,15,000
(x)	**Value of closing stock**:	
	(a) in cost accounts	1,22,000
	(b) in financial accounts	1,12,500

Prepare a Memorandum Reconciliation Account by taking costing loss as base.

Solution **MEMORANDUM RECONCILIATION ACCOUNT**

Particulars – Minus Items	**Rs.**	**Particulars – Plus Items**	**Rs.**
To Net Loss as per Cost Accounts	48,700	By Administration overheads over recovered in Cost Accounts	65,000
To Factory overheads under absorbed in Cost Accounts	30,500	By Depreciation overcharged in Cost Accounts [Rs. 2,70,000 – 2,25,000]	45,000
To Provision for income tax	52,400	By Transfer fees in Financial Accounts	10,200
To Obsolescence loss	20,700	By Notional Rent of own premises	54,000
To Overvaluation of Closing stock in Cost Accounts [Rs. 1,22,000 – Rs. 1,12,500]	9,500	By Overvaluation of Opening stock in Cost Accounts [Rs. 1,38,000 – Rs. 1,15,000]	23,000

To Net Profit (as per Financial Accounts)	35,400		
	1,97,200		**1,97,200**

QUESTION 2

M/s. H.K. Piano Company showed a net loss of Rs. 4,16,000 as per their financial accounts for the year ended 31st March. The cost accounts, however, disclosed a net loss of Rs. 3,28,000 for the same period. The following information were revealed as a result of scrutiny of the figures of both the sets of books:

	Particulars	**Rs.**
(i)	Factory overheads under absorbed	6,000
(ii)	Administrative overheads over absorbed	4,000
(iii)	Depreciation charged in financial accounts	1,20,000
(iv)	Depreciation charged in cost accounts	1,30,000
	Interest on investment not included in costs	20,000
(v)	Income – tax provided	1,20,000
(vi)	Transfer fee (credit in financial accounts)	2,000
(vii)	Stores adjustment (credit in financial books)	2,000

Prepare a Memorandum Reconciliation Account by taking costing loss as base.

Solution

MEMORANDUM RECONCILIATION ACCOUNT

Particulars – Minus Items	**Rs.**	**Particulars – Plus Items**	**Rs.**
To Net Loss as per Cost Accounts	3,28,000	By Administration overheads over recovered in Cost Accounts	4000
To Factory overheads under absorbed in Cost Accounts	6000	By Depreciation overcharged in Cost Accounts [Rs. 130000-120000)	10000
To Provision for income tax	120000	By Transfer fees in Financial Accounts	2000
		By Interest on investment	20000
		By Stores	2000
		By Net Loss (as per Financial Accounts)	4,16,000
	454000		**454000**

UNIT & BATCH COSTING

QUESTION 1

A Company has an annual demand from a single customer for 50,000 litres of a paint product. The total demand can be made up of a range of colour to be produced in a continuous production run after which a set-up of the machinery will be required to accommodate the colour change. The total output of each colour will be stored and then delivered to the customer as single load immediately before production of the next colour commences.The Set up costs are Rs. 100 per set up. The Service is supplied by an outside company as required.

The Holding costs are incurred on rented storage space which costs Rs. 50 per sq. meter per annum. Each square meter can hold 250 Litres suitably stacked.

You are required to:

(i) CALCULATE the total cost per year where batches may range from 4,000 to 10,000 litres in multiples of 1,000 litres and hence choose the production batch size which will minimize the cost.

(ii) Use the economic batch size formula to CALCULATE the batch size which will minimise total cost.

Solution

(i) We know that Total Set up cost = Total no. of set ups x Cost per set up
= [Total Annual demand (50,000 Litres) / Batch Size (In litres)] X Rs.100

Total holding cost = [Batch Size (In litres) / 2] x Holding cost per litre per annum
Holding cost per litre per annum = Rs.50 per Sq. meter per annum / 250 Litres = Rs.0.20 per litre per annum

Batch Size (In litres)	Total Set up cost (Rs.)	Total Holding Cost (Rs.)	Total Cost per annum (Rs.)
4000	1250	400	1650
5000	1000	500	1500
6000	833	600	1433
7000	714	700	1414
8000	625	800	1425
9000	556	900	1456
10000	500	1000	1500

As the total cost is minimum at 7,000 ltr. i.e. Rs. 1,414, thus economic production lot would be 7,000 Litres

Note:- Logically No. of set ups should be rounded up to whole number but institute not consider it.

(ii) .

Economic Batch Quantity (EBQ) = $\sqrt{\frac{2DS}{C}}$

Where, D = 50000 units
S = Setup cost per run = Rs.100
C = Rs.0.20 per lire per annum

$$= \sqrt{\frac{2 \times 50,000 \times 100}{0.2 \times 1}} = 7,071 \text{ Litres}$$

It can be seen that EBQ determined with mathematical formula (7,071 litres) slightly varies from the one determined by trial and error method (7,000 Litres)

JOB COSTING

QUESTION 1

AP Ltd. received a job order for supply and fitting of plumbing materials. Following are the details related with the job work:

Direct Materials

AP Ltd. uses a weighted average method for the pricing of materials issues.

Opening stock of materials as on 12th August 2020:

- 15mm GI Pipe, 12 units of (15 feet size) @ Rs.600 each
- 20mm GI Pipe, 10 units of (15 feet size) @ Rs. 660 each
- Other fitting materials, 60 units @ Rs. 26 each
- Stainless Steel Faucet, 6 units @ Rs. 204 each
- Valve, 8 units @ Rs. 404 each

Purchases:

On 16th August 2020:

- 20mm GI Pipe, 30 units of (15 feet size) @ Rs. 610 each
- 10 units of Valve @ Rs. 402 each

On 18th August 2020:

- Other fitting materials, 150 units @ Rs. 28 each
- Stainless Steel Faucet, 15 units @ Rs. 209 each

On 27th August 2020:

- 15mm GI Pipe, 35 units of (15 feet size) @ Rs. 628 each
- 20mm GI Pipe, 20 units of (15 feet size) @ Rs. 660 each
- Valve, 14 units @ Rs. 424 each

Issues for the hostel job:

On 12th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- Other fitting materials, 18 units

On 17th August 2020:

- 15mm GI Pipe, 8 units of (15 feet size)
- Other fitting materials, 30 units

On 28th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- 15mm GI Pipe, 10 units of (15 feet size)
- Other fitting materials, 34 units
- Valve, 6 units

On 30th August 2020:

- Other fitting materials, 60 units
- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ Rs.100 per hour (includes 12 hours overtime)

Helper: 192 hours @ Rs.70 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ Rs.26 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

(a) CALCULATE the total cost of the job.

(b) CALCULATE the price to be charged from the customer.

SOLUTION -

(a) Calculation of Total Cost for the Job:

Particulars	Amount (Rs.)	Amount (Rs.)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	
- Stainless steel faucet	3,113.57	
- Valve	2,472.75	23,091.95
Direct Labour:		
-Plumber [(180 hours × Rs.100) + (12 hours × Rs.50)]	18,600.00	
-Helper [(192 hours × Rs.70) + (24 hours × Rs.35)]	14,280.00	32,880.00
-Overheads[Rs.26 × (180 + 192) hours]		9,672.00
Total Cost		**65,643.95**

(b) Price to be charged for the job work:

	Amount (Rs.)
Total Cost incurred on the job	65,643.95
Add: 25% Profit on Job Price x ($\frac{65,643.95}{75\%}$ x 25%)	21,881.32
	87,525.27

W. Note 1 – Calculation of Cost of 15mm material used

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							12	600	7200
17th Aug				8	600	4800	4	600	2400
27th Aug	35	628	21980				39	625.1282	24380
28th Aug				10	625.1282	6251.282	29	625.1282	18128.718
Total						**11051.282**			

W. Note 2 – Calculation of Cost of 20mm material used

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							10	660	6600
12th Aug				2	660	1320	8	660	5280
16th Aug	30	610	18300				38	620.526	23580
27th Aug	20	660	13200				58	634.1379	36780
28th Aug				2	634.1379	1268.28			
Total						**2588.28**			

W. Note 3 – Calculation of Cost of Other Fittings material

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							60	26	1560
12th Aug				18	26	468	42	26	1092
17th Aug				30	26	780	12	26	312
18th Aug	150	28	4200				162	27.85	4512
28th Aug				34	27.85	946.96	128	27.85	3565.03
30th Aug				60	27.85	1671.11	68	27.85	1893.92
Total						**3866.07**			

W. Note 4 – Calculation of Cost of Stainless Steel

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							6	204	1224
16th Aug	15	209	3135				21	207.5714	4359
30th Aug				15	207.5714	3113.57			
Total						**3113.57**			

W. Note 5 – Calculation of Cost of Valve

Date	Receipts			Issues			Balance		
	Qty	Rate	Amt	Qty	Rate	Amt	Qty	Rate	Amt
12th Aug							8	404	3232
16th Aug	10	402	4020				18	402.8888	7252
27th Aug	14	424	5936				32	412.125	13188
28th Aug				6	412.125	2472.75	26	412.125	10715.25
Total						**2472.75**			

PROCESS AND OPERATION COSTING

Question 1

From the following Information for the month ending October, 2013, prepare Process Cost accounts for Process III. Use First-in-fist-out (FIFO) method to value equivalent production:-

Direct materials added in Process	III (Opening WIP)	2,000 units at Rs. 25,750
Transfer from Process II		53,000 units at Rs. 4,11,500
Transferred to Process IV		48,000 units
Closing stock of Process III		5,000 units
Units scrapped		2,000 units
Direct material added in Process III		Rs.1,97,600
Direct wages		Rs.97,600
Production Overheads		Rs.48,800

Degree of completion:

	Opening Stock	Closing Stock	Scrap
Materials	80%	70%	100%
Labour	60%	50%	70%
Overheads	60%	50%	70%

The normal loss in the process was 5% of production and scrap was sold at Rs. 3 per unit.

SOLUTION

In this question, There are 4 process in mfd FG but we have to make process account only for process III so there will be 4 cost items:-

1. Material input cost from process II (Material – A)
2. Direct Material Added in process III (Material – B)
3. Direct Wages cost
4. Production Overheads cost

Process III

Statement of Equivalent Production

Input		Output		Material A		Material B		Labour & OH	
Item	**Units**	**Item**	**Units**	**%**	**units**	**%**	**units**	**%**	**units**
Opening WIP	2,000	Opening WIP	2,000	0%	NIL	20%	400	40%	800
Units introduced (Process II Transfer	53,000	Units Introduced & completed (48,000-2,000)	46000	100 %	46000	100 %	46000	100 %	46000
		Normal Loss (2,000+53,000-5,000) X 5%	2500	---	----	----	----	----	-----

		Closing WIP	5000	100 %	5000	70%	3500	50%	2500
		Abnormal Gain	(500)	100 %	(500)	100 %	(500)	100 %	(500)
	55,000		**55000**		**50500**		**49400**		**48800**

Statement of cost per equivalent unit

Particulars	Material – A	Material - B	Labour Cost (Rs.)	Overheads (Rs.)
Cost (Rs.)	411500	197600	97600	48800
Less scrap value (2500 units x Rs. 3)	(7500)			
Net Cost (Rs.) (A)	**404000**	**197600**	**97600**	**48800**
Equivalent units (B)	50500	49400	48800	48800
Cost per equivalent unit (A/B)	8	4	2	1

Student Note (Not to write in exam):- We cannot reduce scrap value from material B since units of input – material B is not given.

Statement of Evaluation

Particulars	Cost Elements	Equivalent Units A	Cost per Equivalent Unit Rs. B	Cost of Equivalent Units Rs (A x B)	Total Rs. (A X B)
Opening WIP					
Cost incurred in previous period				25750	
Cost incurred in current period :	Material A	NIL	8	NIL	
	Material B	400	4	1600	
	Labour	800	2	1600	
	Overhead	800	1	800	
Units introduced & completed	Material A	46000	8	368000	
	Material B	46000	4	184000	
	Labour	46000	2	92000	
	Overhead	46000	1	46000	
Total Cost of Units t/f to next process:					719750
Closing WIP	Material A	5000	8	40000	
	Material B	3500	4	14000	
	Labour	2500	2	5000	
	Overhead	2500	1	2500	61500

Abnormal gain	Material A	500	8	4000	
	Material B	500	4	2000	
	Labour	500	2	1000	
	Overhead	500	1	500	7500

Process III A/c

Particulars	Units	Amt	Particulars	Units	Amt
To opening WIP	2000	25750	By normal loss	2500	7500
To process II A/c	53000	411500	By process IV A/c	48000	719750
To Direct material		197600	By closing WIP	5000	61500
To direct wages		97600			
To Prod. OH		48800			
To Abnormal gain		7500			
	55000	**788750**		**55000**	**788750**

Question 2

'Healthy Sweets' is engaged in the manufacturing of jaggery. Its process involve sugarcane crushing for juice extraction, then filtration and boiling of juice along with some chemicals and then letting it cool to cut solidified jaggery blocks.

The main process of juice extraction (Process – I) is done in conventional crusher, which is then filtered and boiled (Process – II) in iron pots. The solidified jaggery blocks are then cut, packed and dispatched. For manufacturing 10 kg of jaggery, 100 kg of sugarcane is required, which extracts only 45 litre of juice.

Following information regarding Process – I has been obtained from the manufacturing department of Healthy Sweets for the month of January, 2020:

Opening Work in Progress (4500 Units)	
Sugarcane	Rs.50,000
Labour	Rs.15,000
Overheads	Rs.45,000
Sugarcane introduced for juice extraction (1,00,000 Kg)	Rs.5,00,000
Direct Labour	Rs.2,00,000
Overheads	Rs.6,00,000

Abnormal Loss: 1,000 kg

Degree of completion:

Sugarcane	100%
Labour and overheads	80%

Closing work-in process: 9,000 litre

Degree of completion:

Sugarcane	100%
Labour and overheads	80%

Extracted juice transferred for filtering and boiling: 39,500 litre (Consider mass of 1 litre of juice equivalent to 1 kg)

You are required to PREPARE using average method:

(i) Statement of equivalent production,

(ii) Statement of cost,

(iii) Statement of distribution cost, and

(iv) Process-I Account.

Solution

(i) **Statement of Equivalent Production**

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Sugarcane		Labour & O.H.	
				%	Units	%	Units
Opening WIP	4,500	Completed and transferred to Process - II	39,500	100	39,500	100	39,500
Units introduced	1,00,000	Normal Loss (55%* of1,00,000)	55,000	--	--	--	--
		Abnormalloss	1,000	100	1,000	80	800
		Closing WIP	9,000	100	9,000	80	7,200
	1,04,500		1,04,500		49,500		47,500

*** 100 kg of sugarcane extracts only 45 litre of juice.**
Thus, normal loss = 100 – 45 = 55%

(ii) Statement showing cost for each element

Particulars	Sugarcane (Rs.)	Labour (Rs.)	Overhead (Rs.)	Total (Rs.)
Cost of opening work-in-process	50,000	15,000	45,000	1,10,000
Cost incurred during the month	5,00,000	2,00,000	6,00,000	13,00,000
Total cost: (A)	5,50,000	2,15,000	6,45,000	14,10,000
Equivalent units: (B)	49,500	47,500	47,500	
Cost per equivalent unit: (C) =(A ÷ B)	11.111	4.526	13.579	29.216

(iii) Statement of Distribution of cost

	Amount (Rs.)	Amount (Rs.)
1. Value of units completed and transferred(39,500 units × Rs. 29.216)		11,54,032
2. Value of Abnormal Loss:		
- Sugarcane (1,000 units × Rs. 11.111)	11,111	
- Labour (800 units × Rs. 4.526)	3,621	
- Overheads (800 units × Rs. 13.579)	10,863	25,595
3. Value of Closing W-I-P:		
- Sugarcane (9,000 units × Rs. 11.111)	99,999	
- Labour (7,200 units × Rs. 4.526)	32,587	
- Overheads (7,200 units × Rs. 13.579)	97,769	2,30,355

(iv) Process-I A/c

Particulars	Units	(Rs.)	Particulars	Units	(Rs.)
To Opening W.I.P:			By Normal Loss	55,000	--
- Sugarcane	4,500	50,000	By Abnormalloss [Rs. 25,595 + Rs. 18 (Diff.due to approx.	1,000	25,613
- Labour	--	15,000	By A/c Process-II	39,500	11,54,032
- Overheads	--	45,000	By Closing WIP	9,000	2,30,355
To Sugarcane Introduced	100,000	5,00,000			
To Direct Labour		2,00,000			
To Overheads		6,00,000			
	104,500	14,10,000		104,500	14,10,000

JOINTS AND BY- PRODUCTS

Question 1

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC. In the month of July, Inorganic Chemicals purchased Salt for Rs.40,000. Conversion ofRs.60,000 were incurred upto the split off point, at which time twosaleable products were produced. Chlorine can be further processed into PVC.

The July production and sales information is as follows:

	Production (tonne)	Sales quantity (tonne)	Selling price (per tonne)
Caustic Soda	1,200	1,200	Rs.50
Chlorine	800	—	—
PVC	500	500	Rs.200

All 800 tonnes of Chlorine were further processed, at an incremental cost of Rs. 20,000 to yield 500 tonnes of PVC. There was no beginning or ending inventories of Caustic Soda, Chlorine or PVC in July.

There is active market for Chlorine. Inorganic Chemicals could have sold all its July production of Chlorine at Rs. 75 per tonne.

Required :

1. To calculate how joint cost of Rs.1,00,000 would be apportioned between Caustic Soda and Chlorine under each of following methods :
   a. Sales value at split off,
   b. Physical measure (method), and
   c. Estimated net realisable value.

2. Lifetime Swimming Pool Products offers to purchase 800 tonnes of Chlorine in August at Rs.75 per tonne. This sale of Chlorine would mean that no PVC would be produced in August. How the acceptance of this offer for the month of August would affect operating income?

SOLUTION

1 (a) Sales value at split off method

Products	Sales in tonnes (a)	Selling price per tonne (b)	Sales value (Rs) (c)=(a) × (b)	Sale value ratio	Joint cost apportioned
Caustic Soda	1,200	50	60,000	50%	50,000
Chlorine	800	75	60,000	50%	50,000
			1,20,000	**100%**	**1,00,000**

(b) Physical Measure Method

Products	Production (in tonnes)	Quantity Rati	Joint cost apportioned
Caustic Soda	1,200	60%	60,000
Chlorine	800	40%	40,000
	2,000	**100%**	**1,00,000**

(c) Estimated net realisable value method

Particulars	Caustic Soda	Chlorine	Total
Sale value after further processing (No. of units manufactured x Selling price)	60,000 (1,200 tonnes X Rs. 50)	1,00,000 (500 tonnes of PVC X Rs. 200)	160000
Less:- Further processing costs	----	(20000)	(20000)
NRV	60000	800000	140000
NRV Ratio	42.857%	57.143%	100%
Joint cost	42857	57143	100000

2.Incremental revenue from further processing of Chlorine into PVC

Products	**Chlorine** (Rs)
Sales revenue after further processing: (A)	100000 (500 tonnes x Rs.200)
Sales revenue at the point of split off: (B)	60000 (800 Tonnes x Rs. 75)
Incremental sales revenue: (C)={(A)-(B)}	40000
Further processing cost: (D)	(20000)
Profit (Loss) arising due to further processing: {(C) – (D)}	20000

If company process chlorine into PVC then it would earn Rs.20000 extra but if company chooses to produce chlorine to Lifetime swimming pool products then it would be a loss of incremental income.

Question 2

'Buttery Butter' is engaged in the production of Buttermilk, Butter and Ghee. It purchases processed cream and let it through the process of churning until it separates into buttermilk and butter. For the month of January, 2020, 'Buttery Butter' purchased 50 Kilolitre processed cream @ Rs. 100 per 1000 ml. Conversion cost of Rs. 1,00,000 were incurred up-to the split off point, where two saleable products were produced i.e. buttermilk and butter. Butter can be further processed into Ghee.

The January, 2020 production and sales information is as follows:

Products	Production (in Kilolitre / tonne)	Sales Quantity (in Kilolitre/ tonne)	Selling price per Litre/Kg (Rs.)
Buttermilk	28	28	30
Butter	20	—	—
Ghee	16	16	480

All 20 tonne of butter were further processed at an incremental cost of Rs. 1,20,000 to yield 16 Kilolitre of Ghee. There was no opening or closing inventories of buttermilk, butter or ghee in January, 2020.

Required:

(i) SHOW how joint cost would be apportioned between Buttermilk and Butter under Estimated Net Realisable Value method.

(ii) 'Healthy Bones' offers to purchase 20 tonne of butter in February at Rs. 360 per kg. In case 'Buttery Butter' accepts this offer, no Ghee would be produced in February. SUGGEST whether 'Buttery Butter' shall accept the offer affecting its operating income or further process butter to make Ghee itself?

Solution

(i) Estimated Net Realisable Value Method:

	Buttermilk Amount (Rs.)	**ButterAmount (Rs.)**
Sales Value	28 Kilo litre x 1000 litre per kilo x Rs.30 per litre = Rs.8,40,000	16 Kilo litre x 1000 litre per kilo x Rs.480 per litre = Rs.76,80,000
Less Further Processing cost		(Rs.1,20,000)
NRV	**8,40,000**	**75,60,000**
Joint in NRV-Ratio	**5,10,000**	**45,90,000**

Joint cost = 50 Kilo litre x 1000 litre per kilo x Rs.100 per litre + Rs.1,00,000 = 51,00,000

(ii) Decision as to further processing of product Z

Particulars	Amount (Rs.)
Sales value after further processing (A)	16 Kilo litre x 1000 litre per kilo x Rs.480 per litre = Rs.76,80,000
Sales value at split off point (B)	20 tonne x 1000 litre per tonne x Rs.360 = Rs.72,00,000
Incremental Sales revenue (C)={(A)-(B)}	4,80,000
Further processing cost: (D)	(1,20,000)
Profit (Loss) arising due to further processing {(C) – (D)}	3,60,000

Entity is earning extra profit as Rs.360000 if it further process the butter into ghee which shall be lost in case it accepts offer of "Healthy Bones" Hence it should not accept the offer.

SERVICE COSTING

Question 1

SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a larger number of students availing of the bus service the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The work-load of the students has been so arranged that in the morning the first trip picks up senior students and the second trip plying an hour later picks up the junior students. Similarly in the afternoon the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus one way is 8 km. The school works 25 days in a month and remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all 12 months in a year.

The details of expenses for a year are as under :

Driver's salary	Rs.4,500 per month per driver
Cleaner's salary	Rs.3,500 per month
(Salary payable for all 12 months)	
(one cleaner employed for all the five buses)	
Licence fee, taxes, etc.	Rs.8,600 per bus per annum
Insurance	Rs.10,000 per bus per annum
Repairs & maintenance	Rs.35,000 per bus per annum
Purchase price of the bus	Rs.15,00,000 each
Life of each bus	12 years
Scrap value of buses at the end of life	Rs.3,00,000
Diesel cost	Rs.45.00 per litre

Each bus gives an average mileage of 4 km. per litre of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range upto 4 km. of distance from the school are charged half fare and fifty per cent of the students travelling in each trip are in this category.
Ignore interest. Since the charges are to be based on average cost you are required to :

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year.
(ii) Work out the average cost per student per month in respect of –
  (A) students coming from a distance of upto 4 km. from the school and
  (B) students coming from a distance beyond 4 km. from the school.

Solution

Calculation of km. run by a bus in a year: = 8 km X 8 trip X 25 days X 9 months = 14400 km

(i) Statement of Operating Cost

Particulars	Per Bus p.a.	Fleet of 5 Buses
Fixed expenses:-		
Driver Salary (4500 X 12 months)	54,000	2,70,000
Cleaner's salary ($\frac{3500 \text{ X } 12 \text{ months}}{5 \text{ buses}}$)	8,400	42,000
License Fees	8,600	43,000
Insurance	10,000	50,000
Depreciation ($\frac{15\ lacs - 3\ lcas}{12}$)	1,00,000	5,00,000
Total (A)	**1,81,000**	**9,05,000**
Variable Expenses		
Diesel Cost ($\frac{14400\ X\ 45}{4\ km}$) – **(B)**	162,000	8,10,000
Maintenance Exp.		
Repair & Maintenance – ('C)	35,000	1,75,000
Total Cost	**3,78,000**	**18,90,000**

(ii) Let assume average cost per student per month is Rs. X
Monthly Cost shall be Rs. (3,78,000/ 12 months) = 31,500

Statement Showing No. of Students with their Monthly Cost

Distance range	Students	Cost per month
Within 4 km	50	X/2
Above 4 km	50	X
Total	**100**	

Daily Revenue = Daily Cost + Daily Profit (Zero Profit)
50 X $\frac{x}{2}$ + 50x = 31500
x = 420
Hence, Average cost per student :-
Within 4 km shall be rs. 210 (420/2)
Above 4 km shall be Rs. 420

Category B Question:-	• School is not making profit for 3 months. Rather school is recovering cost incurred for 9 months in 12 months. • Monthly cost per bus per month shall be recovered from senior & junior students using that bus • Monthly cost per bus per month = Senior students x Bus fees per student per month + Junior students x bus fees per student per month

Question 2

AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes, but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

Particulars	Amount (Rs.)
Teachers' salary (25 teachers × Rs. 35,000 × 12 months)	1,05,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × Rs. 15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × Rs.10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

Other information:

(i)

	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840
Lab classes in a year	0	0	144	156
No. of Examinations in a year	2	2	2	2
Time spent at library per student per year	180 Hours	120 Hours	240 Hours	60 Hours
Time spent by principal for administration	208 Hours	312 Hours	480 Hours	1400 Hours
Teachers for 11 & 12 standard	4	5	6	10

(ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.

(iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.

(iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section

(v) All school students irrespective of section and age participates in annual functions and sports activities

Required

a) CALCULATE cost per student per annum for all three streams
b) If the management decides to take uniform fee of Rs. 1,000 per month from all higher secondary students, CALCULATE stream wise profitability
c) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively.

Solution

Requirement (a) – Question is asking cost per student per annum for all three streams.

Formula = $\frac{\text{Total Annual Cost of all three streams}}{\text{Total number of students of all three streams}}$

Please Note We shall not include cost of "Primary & Secondary".

Statement Showing Total Annual Cost of all three streams

Particulars	**WN**	**Arts (Rs.)**	**Commerce (Rs.)**	**Science (Rs.)**
Teachers' salary	1	1596000	2245091	2458909
Principal's salary	2	124800	187200	288000
Lab attendants' salary	3	-	-	172800
Salary to library staff	4	43200	28800	57600
Salary to peons	5	31636	94909	47455
Salary to other staffs	6	38400	115200	57600
Examinations expenditure	7	86400	259200	129600
Office & Administration cost	8	121600	364800	182400
Annual day expenses	8	36000	108000	54000
Sports expenses	8	9600	28800	14400
Total Cost	**A**	**2087636**	**3432000**	**3462764**
Total No. of Students	B	120	360	180
Cost Per Student Per Annum	**A/B**	**17397**	**9533**	**19238**

Working Note – 1 – Calculation of Teacher's Salary for all three streams

Particulars		Arts	Commerce	Science
Total No. of Teachers	A	4	5	6
Salary Per Teacher Per Annum	B	Rs.35,000 X 12 Months = Rs.4,20,000	Rs.35,000 X 12 Months = Rs.4,20,000	Rs.35,000 X 12 Months = Rs.4,20,000
Total Salary of All Teachers	AXB	Rs.1680000	Rs.2100000	Rs.2520000
Adjustment	Note 1	(Rs.84000)	Rs.84000	
Adjustment	Note 2		Rs.61091	(Rs.61091)
Total		**Rs.1596000**	**Rs.2245091**	**Rs.2458909**

Note 1 – Given "One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students".

It means a teacher of "Arts" also teaches "Commerce" hence his yearly salary (equal to 208 classes) shall be added to "Commerce Head" and hence shall be deducted from "Arts Head".

Amount to be adjusted = $\frac{\text{Rs.4,20,000}}{\text{1040 Classes}}$ x 208 Classes = Rs.84,000

Note 2 – There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.

It means a teacher of "Science" also teaches "Commerce" hence his yearly salary (equal to 160 classes) shall be added to "Commerce Head" and hence shall be deducted from "Science Head".

Amount to be adjusted = $\frac{\text{Rs.4,20,000}}{\text{1100 Classes}}$ x 160 Classes = Rs.61091

Working Note – 2 – Calculation of Principal's Salary for all three streams

Principal's Salary of Rs.1440000 apportioned in ratio of "Time spent by principal for administration".

Particulars	Ratio	Arts	Commerce	Science	Primary & Secondary
Principal's Salary	208:312:480:1400	124800	187200	288000	840000

Working Note – 3 – Calculation of "Lab assistants' Salary" for all three streams

Lab assistants' Salary of Rs.360000 apportioned in ratio of "Lab classes in a year".

Particulars	Ratio	Arts	Commerce	Science	Primary & Secondary
Lab assistants' Salary	0:0:144:156	-	-	172800	187200

Working Note – 4 – Calculation of "Salary to library staff" for all three streams

Salary to library staff of Rs.144000 apportioned in ratio of "Time spent at library per student per year".

Particulars	Ratio	Arts	Commerce	Science	Primary & Secondary
Salary to library staff	180:120:240:60	43200	28800	57600	14400

Working Note – 5 – Calculation of "Salary to peons" for all three streams

First of all, We need to calculate "Salary to peons" for "higher Secondary"

Particulars	Amount (Rs.)
One Peon dedicated for higher secondary (1 Peon X Rs.10000 X 12 Month)	120000
15% of other 3 peons (3 Peon X Rs.10000 X 12 Month X 15%)	54000
Total	**174000**

Salary to peons of Rs.174000 apportioned in ratio of "No. of students ".

Particulars	Ratio	Arts	Commerce	Science
Salary to peons	120:360:180	31636	94909	47455

Working Note – 6 –

Particulars	Amt	Ratio	Arts	Commerce	Science	Primary & Secondary
Salary to other staffs	480000	No. of Students 120:360:180:840	38400	115200	57600	268800
Exam. Exp.	1080000	No. of Students 120:360:180:840	86400	259200	129600	604800
Office & Administration cost	1520000	No. of Students 120:360:180:840	121600	364800	182400	851200
Annual day expenses	450000	No. of Students 120:360:180:840	36000	108000	54000	252000
Sports expenses	120000	No. of Students 120:360:180:840	9600	28800	14400	67200

Note - Examinations expenditure may also be apportioned in ratio of "No. of examinations in a year"
Requirement (b) Calculation of Profitability

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Fees per annum	12000	12000	12000	
Cost per student per annum	17397	9533	19238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
Total No. of Students	120	360	180	
Total Profit/ (Loss)	(647640)	888120	(1302840)	(1062360)

Requirement (C) Calculation of fees to be charged to earn 10% profit on cost

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)
Cost per student per annum	17397	9533	19238
Add: Profit @10%	1740	953	1924
Fees Per Annum	19137	10486	21162
Total No. of Months	12	12	12
Fees Per Month	1595	874	1764

Question 3

SLS Infrastructure built and operates 110 k.m. highway on the basis of Built-Operate-Transfer (BOT) for a period of 25 years. A traffic assessment carried out to estimate the traffic flow per day shows the following figures:

Sl. No.	Type of vehicle	Daily traffic volume
1	Two wheelers	44,500
2	Car and SUVs	3,450
3	Bus and LCV	1,800
4	Heavy commercial vehicles	816

The following is the estimated cost of the project:

Sl. No.	Activities	Amount (Rs. In Lakh)
1	Site clearance	170.70
2	Land development and filling work	9,080.35
3	Sub base and base courses	10,260.70
4	Bituminous work	35,070.80
5	Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc	29,055.60
6	Drainage and protection work	9,040.50
7	Traffic sign, marking and road appurtenance	8,405.00
8	Maintenance, repairing and rehabilitation	12,429.60
9	Environmental management	982.00
Total Project Cost		114,495.25

An average cost of Rs.1,120 lakh has to be incurred on administration and toll plaza operation. On the basis of the vehicle specifications (i.e. weight, size, time saving etc.), the following weights has been assigned to the passing vehicles:

Sl. No.	Type of Vehicle	
1	Two wheelers	5%
2	Car and SUVs	20%
3	Bus and LCV	30%
4	Heavy commercial vehicles	45%

Required

i. Calculate the Total Project cost per day of concession period.
ii. Compute toll fee to be charged for per vehicle of each type, if the company wants to earn a profit of 15% on total cost.

Note – Concession period is a period for which an infrastructure is allowed to operate and recovers its investment.

Solution

Special Note – In Practical life, Toll fee is charged to different vehicles on the basis of weight. Suppose Rs.50 is charged for bike of 100 Kg then Rs.75 shall be charged for a car of 150 Kg. Pl note that it is not the type of car rather it is weight on the basis of which toll is charged to customer.

Sl. No.	Type of Vehicle	Daily traffic volume	Weight
1	Two wheelers	44,500	5%
2	Car and SUVs	3,450	20%
3	Bus and LCV	1,800	30%
4	Heavy commercial vehicles	816	45%

If entity charge toll of Rs.X for two wheelers whose weight is 5%, it means

- Rs.4X shall be charged for car and SUVs since weight is 4 times of weight of Two wheelers.
- Rs.6X shall be charged for Bus & LCV since weight is 6 times of weight of Two wheelers.
- Rs.9X shall be charged for Heavy Commercial Vehicle since weight is 9 times of weight of Two wheelers.

Sl. No.	Type of Vehicle	Daily traffic volume	Toll (Rs.)	Daily Toll Collection (Rs.)
1	Two wheelers	44,500	X	44500X
2	Car and SUVs	3,450	4X	13800X
3	Bus and LCV	1,800	6X	10800X
4	Heavy commercial vehicles	816	9X	7344X
	Total			**76444X**

Requirement (i) Statement showing Cost Per Day

Particulars	Amount (Rs.)
Total Project Cost (Given in Question)	114495.25 Lakh
Adm. & Toll Plaza Operation Cost	1120.00 Lakh
Total Cost	**115615.25** Lakh
Total Days in Concession Period	25 Years X 365 Days = 9125 Days
Cost per Day	Rs.12.67 Lakh

Requirement (ii) – Computation of Toll Fee

We know that

Daily Total Toll Collection = Daily Total Cost + Desired profit

76444X = Rs.12670000 + 15% on Rs.1267000

X = Rs.19.06

Sl. No.	Type of Vehicle	Toll (Rs.)	Toll (Rs.)
1	Two wheelers	X	Rs.19.06
2	Car and SUVs	4X	4x Rs.19.06 = Rs.76.24
3	Bus and LCV	6X	6 x Rs.19.06 = Rs.114.36
4	Heavy commercial vehicles	9X	9 x Rs.19.06 = Rs.171.54
	Total		

STANDARD COSTING

Question 1

GAP Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. Following are the details.

Budgeted data:

Material	Qty	Price (Rs.)	Amount (Rs.)
A	60	20	1200
B	40	30	1200
Inputs	100		2400
Normal loss	20		
Output	80		2400

Actual data:

Actual output - 80 units.

Material	Qty	Price (Rs.)	Amount (Rs.)
A	70	?	?
B	?	30	?

Material Price Variance (A) Rs. 105A
Material cost variance Rs. 275A

You are required to CALCULATE:

(i) Actual Price of material A
(ii) Actual Quantity of material B
(iii) Material Price Variance
(iv) Material Usage Variance
(v) Material Mix Variance
(vi) Material Sub Usage Variance

Solution

Particulars	SP X SQAO	SP X RSQ	SP X AQ	AP X AQ
A	Rs. 20 X 60 units	Rs. 20 X	Rs. 20 X 70 units	Rs. P X 70 units
B	Rs. 30 X 40 units	Rs. 30 X	Rs. 30 X Q	Rs. 30 X Q
Total	**M1**	**M2**	**M3**	**M4**
	2400			

DMCV = M1 – M4
DMUV = M1 – M3
DMPV = M3 – M4

DMYV = M1 – M2
DMMV = M2 – M3

(i) Actual Price of Material A

Let Actual Price of Material A be 'Rs. P'

Material Price Variance of Material A = Rs. 105 (A)

M3 – M4 = Rs. 105 (A)

SP X AQ – AP X AQ = (SP – AP) × AQ

(20 – P) × 70 = 105 (A)

1,400 – 70 P = -105

P = 1,505 ÷ 70 = 21.5

Therefore P (Actual Price) = Rs. 21.5

(ii) Actual Quantity of Material B

Let Actual Quantity of Material B be 'Q'

Material Cost Variance = M1 – M4

Material Cost Variance = 275 (A)

2400 – 21.5 X 70 – 30 x Q = 275 (A)

895 – 30 Q = - 275

Q = 1,170 ÷ 30 = 39 units

Particulars	SP X SQAO	SP X RSQ	SP X AQ	AP X AQ
A	Rs. 20 X 60 units	Rs. 20 X 65.40 units	Rs. 20 X 70 units	Rs. 21.50 X 70 units
B	Rs. 30 X 40 units	Rs. 30 X 43.60 units	Rs. 30 X 39 Units	Rs. 30 X 39 Units
Total	**M1**	**M2**	**M3**	**M4**
	2400	**2616**	**2570**	**2675**

To Calc. RSQ, We need to divide sum of AQ in Standard Units ratio.
Sum of AQ = 70 units + 39 units = 109 units
Standard Units Ratio = 60:40
RSQ of Material A = 65.40 units
RSQ of Material B = 43.60 units

(iii) Material Price Variance = M3 – M4

Material A = Rs. 105 (A)
Material B = Rs. 0
Total = Rs. 105 (A)

(iv) Material Usage Variance = M1 – M3

Material A = Rs. 200 (A)
Material B = Rs. 30 (F)
Total = Rs. 170 (A)

(v) Material Mix Variance = M2 – M3

Material A = Rs. 92 (A)
Material B = Rs. 138 (F)
Total = Rs. 46 (F)

(vi) Material Yield Variance = M1 – M2

Material A = Rs. 108 (A)
Material A = Rs. 108 (A)
Total = Rs. 216 (A)

Question 2

Paras Synthetics uses Standard costing system in manufacturing of its product 'Star 95 Mask'. The details are as follows;

Direct Material 0.50 Meter @ Rs. 60 per meter	Rs. 30
Direct Labour 1 hour @ Rs. 20 per hour	Rs. 20
Variable overhead 1 hour @ Rs. 10 per hour	Rs. 10
Total Rs. 60	

During the month of August, 2020 10,000 units of 'Star 95 Mask' were manufactured.
Details are as follows:
Direct material consumed 5700 meters @ Rs. 58 per meter
Direct labour Hours ? @ ? Rs. 2,24,400
Variable overhead incurred Rs. 1,12,200
Variable overhead efficiency variance is Rs. 2,000 A. Variable overheads are based on Direct Labour Hours.
You are required to calculate the missing data and all the relevant Variances.

Solution

(i) Material Variances

Particulars	**SP X SQAO**	**SP X RSQ**	**SP X AQ**	**AP X AQ**
	Rs.60 X 5000 Kg	NA	Rs.60 X 5700 Kg	Rs.58 X 5700 Kg
Total	**M1**	**M2**	**M3**	**M4**
	Rs.3,00,000		Rs.3,42,000	Rs.3,30,600

Material Cost Variance = M1 – M4 = 3,00,000 – 3,30,600 = Rs. 30,600(A)
Material Price Variance = M3 – M4 = Rs. 11,400 (F)
Material Usage Variance = M1 – M3 = Rs. 42,000 (A)

(ii) Variable Overheads variances

Computation of Variable Overheads variances

Output absorbed V. OH	Input absorbed V. OH	Actual V. OH
VO 1	VO 2	VO 3
Actual O/P X Budgeted VOH per unit	Actual Hours X Budgeted VOH per hour	Actual VOH
10000 units x Rs.10 per unit = Rs.1,00,000	X Rs.10 Per hour	Rs.1,12,200

VOCV = VO 1 – VO 3
VO Eff. V = VO 1 – VO 2
VO Exp. V = VO 2 – VO 3

Given is VO Eff. V = VO 1 – VO 2
Rs.1,00,000 – Actual Hours x Rs.10 = Rs.2000 (A)
Actual Hours = 10200 Hours
VO Exp. V = VO 2 – VO 3 = 10200 Hours x Rs.10 – Rs.112200 = Rs.10,200(A)

(i) Labour variances

SR X SHAO	SR X RSH	SR X AHW	SR X AHP	AR X AHP
Rs.20 X 10000 Hours	NA	Rs.20 X 10200 Hours	Rs.20 X 10200 Hours	X 10200 Hours
L1	**L2**	**L3**	**L4**	**L5**
Rs.2,00,000		**Rs.2,04,000**	**Rs.2,04,000**	**Rs.2,24,400**

Actual Rate = Rs. 2,24,400÷10,200 hours = Rs.22

Labour Cost Variance = L1 – L5 = Rs.2,00,000 – Rs.2,24,400 = Rs. 24,400 (A)
Labour Rate Variance = L4 – L5 = Rs.2,04,000 – Rs.2,24,400 Rs. 20,400 (A)
Labour Efficiency Variance = L1 – L3 = Rs. 4,000 (A)

Question 3
Following data is extracted from the books of XYZ Ltd. for the month of January, 2020:

(i) Estimation-

Particulars	Quantity (kg.)	Price (Rs.)	Amount (Rs.)
Material-A	800	?	--
Material-B	600	30.00	18,000

Normal loss was expected to be 10% of total input materials.

(ii) Actuals- 1480 kg of output produced.

Particulars	Quantity (kg.)	Price (Rs.)	Amount (Rs.)
Material-A	900	?	--
Material-B	?	32.50	--
			59,825

(iii) Other Information-

Material Cost Variance = Rs. 3,625 (F)
Material Price Variance = Rs. 175 (F)
You are required to CALCULATE:

i. Standard Price of Material-A;
ii. Actual Quantity of Material-B;
iii. Actual Price of Material-A;
iv. Revised standard quantity of Material-A and Material-B; and
v. Material Mix Variance.

Solution

Particulars	**SP X SQAO**	**SP X RSQ**	**SP X AQ**	**AP X AQ**
A	X 940 KG		X 900 KG	X 900 KG
B	Rs.30 X 705 Kg			Rs.32.50 X
Total	**M1**	**M2**	**M3**	**M4**
				59,825

(i) Material Cost Variance (A + B) = M1 – M4

SP of Material A X 940 Kg + Rs.30 X 705 Kg – Rs.59,825 = 3625 (F)

Standard Price of Material-A = Rs.45

Working Note:

SQ i.e. quantity of inputs to be used to produce actual output

$$= \frac{1{,}480\text{kg}}{90\%} = 1{,}645 \text{ kg}$$

$$\text{SQAO A} = \frac{800\text{kg}}{(800+600)} \times 1{,}645\text{kg.} = 940 \text{ KG}$$

$$\text{SQAO B} = \frac{600\text{kg}}{(800+600)} \times 1{,}645\text{kg.} = 705 \text{ kg}$$

(ii) Material Price Variance (A + B) = M3 – M4

Rs.45 x 900 Kg + Rs.30 X AQ of Material B – Rs.59825 = Rs.175(F)

AQ of Material B = 650 kg.

(iii) (AQ × AP) = Rs. 59,825

AP of Material A X 900 Kg + 21125 = 59825

Actual Price of Material-A = Rs. 43

(iv) To Calc. RSQ we need to divide Sum of AQ in Standard Units Ratio

Sum of AQ = 900 kg + 650 kg = 1550 kg

Standard kg Ratio = 800:600

$$\text{Revised SQA} = \frac{800\text{kg}}{(800+600)} \times 1{,}550\text{kg} \text{ . } \mathbf{= 886\ kg}$$

$$\text{Revised SQB} = \frac{600\text{kg}}{(800+600)} \times 1{,}550\text{kg} \text{ . } \mathbf{= 664\ kg}$$

(v) Material Mix Variance (A + B) = M3 – M4
Rs.45 x 886 Kg + Rs.30 x 664 Kg - Rs.45 x 900 Kg - Rs.30 x 650 Kg
= **Rs. 210 (A)**

Question 4
One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June 2023:
(a) Standard mix for chemical A is 50% and chemical B is 50%.
(b) Standard price kilogram of chemical A is Rs. 12 and chemical B is Rs. 15.
(c) Actual input of chemical B is 70 kilograms.
(d) Actual price per kilogram of chemical A is Rs. 15
(c) Standard normal loss is 10% of total input
(d) Total Material cost variance is Rs. 650 adverse.
(e) Total Material yield variance is Rs. 135 adverse.
(f) Total Actual output is 90 Kg.
You are required to CALCULATE:
(i) Total Material mix variance
(ii) Total Material usage variance
(iii) Total Material price variance
(iv) Actual loss of actual input
(v) Actual input of chemical A
(vi) Actual price per kg. of chemical B

Solution

Material Variances

Particulars	**SP X SQAO**	**SP X RSQ**	**SP X AQ**	**AP X AQ**
A	Rs.12 X 50 Kg	Rs.12 X 55 Kg	Rs.12 X 40 Kg	Rs.15 X 40 Kg
B	Rs.15 X 50 Kg	Rs.15 X 55 Kg	Rs.15 X 70 Kg	Rs.20X 70 Kg
Total	**1350**	**1485**	**1530**	**2000**

Table to calculate Std. Output

Assumed input kg	100 Kg
Then A	50 Kg
Then B	50 Kg
Total	100 Kg
Less:- Standard Loss 10%	(10 kg)
Std. output	90 Kg

W. Note 1 - Let us assume Actual Quantity (AQ) of chemical A is A Kg.
Then Sum Total of actual Quantity of both the materials is (A + 70Kg)
RSQ = Total Actual input in budgeted ratio = (A+70) in 50%:50%
A (RSQ) = 0.50A + 35
B (RSQ) = 0.50A + 35

DMYV = M1 – M2 = [Rs.12 x 50 Kg + Rs.15 x 50 Kg] – [Rs.12x (0.50A+35) + Rs.15 x (0.50A+35)] = 135(A)

600 + 750 – 6A – 420 – 7.50A – 525 = -135
405 – 13.50A = -135
13.50A = 405 + 135
A = 540 / 13.50 = 40 Kg
Hence Actual Quantity (AQ) of chemical A is 40 Kg

RSQ = Total Actual input in budgeted ratio = (A+70) in 50%:50%
A (RSQ) = 0.50A + 35 = 0.50 x 40 + 35 = 55 Kg
B (RSQ) = 0.50A + 35 = 0.50 x 40 + 35 = 55 Kg

W. Note 2 -We are given DMCV which means M1 – M4
DMCV = M1 – M4 = 650(A)
Let us assume Price of chemical B be Rs.B
1350 – [15x40 + Bx70] = -650
1350 – 600 – 70B = -650
750 – 70B = -650
70B = 750 + 650
B = 1400 / 70 = Rs.20 per kg

Requirements of Question

- DMMV = M2 – M3 = 45(A)
- DMUV = M1 – M3 = 180(A)
- DMPV = M3 – M4 = 470(A)
- Actual loss of input = Total Actual input – Total Actual output = 40Kg + 70Kg – 90 Kg = 20 Kg
- Actual input of Chemical A = 40 KG (W. Note 1)
- Actual price per kg. of Chemical B = Rs.20 (W. Note 2)

MARGINAL COSTING

Question 1

WONDER LTD. manufactures a single product, ZEST. The following figures relate to ZEST for a one-year period:

Activity Level	50%	100%
Sales and production (units)	400	800
	Rs. lakhs	Rs. lakhs
Sales	8.00	16.00
Production costs:		
Variable	3.20	6.40
Fixed	1.60	1.60
Selling and administration costs:		
Variable	1.60	3.20
Fixed	2.40	2.40

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year.

In the first quarter, 220 units were produced and 160 units were sold.

Required

(a) What would be the fixed production costs absorbed by ZEST if absorption costing is used?
(b) What would be the under/over-recovery of overheads during the period?
(c) What would be the profit using absorption costing?
(d) What would be the profit using marginal costing?

Solution

Working Note 1:- Calculation to closing stock units

Particulars	Units
Opening stock	NIL
Add Produced	220 units
Less Sold	(160 units)
Closing Stock	**60 units**

Working Note 2:-

Variable production cost per unit	$\frac{Rs.3,20,000}{400\ units}$ = Rs. 800 per unit
Variable selling & Dist cost per unit	$\frac{Rs.160,000}{400\ units}$ = Rs. 400 per unit
Selling price per unit	$\frac{Rs.1600,000}{800\ units}$ = Rs. 2000 per unit
Fixed production cost per quarter	$\frac{Rs.160,000}{4\ Qtr}$ = Rs. 40,000
Fixed Selling &Dist OH per quarter	$\frac{Rs.240,000}{4\ Qtr}$ = Rs. 60,000

Fixed production OH per unit	$\frac{Rs.160,000}{800\ units}$ = Rs. 200 per unit

(d) Income statement under Marginal costing approach

Particulars	Amount (Rs.)
Variable (Direct Material Cost)	
Variable (Direct Labour Cost)	
Variable (Direct Expenses)	
Variable Factory OH	
Variable manufacturing cost of Quantity Produced 220 units x Rs.800	**176000**
Add:- Opening FG	NIL
Less:- Closing FG 60 units x Rs.800	(48,000)
Variable manufacturing cost of Quantity Sold	**1,28,000**
Add:- Variable Selling OH 160 units x Rs.400	64,000
Variable Cost of Sales (A)	**1,92,000**
Sales (B)	3,20,000
Contribution (B – A)	1,28,000
Less:- Fixed Factory OH Fixed Office and Admin OH Fixed Selling & Distribution OH	40000 60000
Profit	**28000**

(c) Income statement under Absorption costing approach

Particulars	Amount (Rs.)
Variable (Direct Material Cost)	
Variable (Direct Labour Cost)	
Variable (Direct Expenses)	
Variable Factory OH	
Total **220 units x Rs.800**	**176000**
Fixed Factory OH **absorbed** 220 units x Rs.200	44,000
Total manufacturing cost of Quantity Produced	**2,20,000**
Add:- Opening FG	NIL
Less:- Closing FG 60 units	(60000)
Total manufacturing cost of Quantity Sold	**160000**
Add:- Variable Selling & Dist. OH 160 units x Rs.400 Fixed Selling and Dist. OH	64,000 60000
Add:- Under absorbed OH (Actual OH incurred – OH absorbed) Less:- Over absorbed OH (OH absorbed – Actual OH incurred) (40000 – 44000)	(4000)
Total Cost of Sales (A)	**2,80,000**
Sales (B)	**3,20,000**
Profit (B – A)	**40,000**

(a) Fixed production cost absorbed
= Actual production in units x Fixed production overhead per unit
= 220 units x Rs. 200 per unit = Rs. 44,000

(b) Fixed Production Overheads absorbed = Rs. 44,000
Actual Fixed production overheads = Rs. 40,000

Over absorbed Overheads = Rs. 44,000 – 40,000 = Rs. 4,000

Question 2

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

	Part A	Part B
Per unit		
Alloy usage	1.6 kgs.	1.6 kgs.
Machine Time: Machine P	0.6 hrs	0.25 hrs.
Machine Time: Machine Q	0.5 hrs.	0.55 hrs.
Target Price (Rs.)	145	115
Total hours available	Machine P 4,000 hours Machine Q 4,500 hours	

Alloy available is 13,000 kgs. @ Rs. 12.50 per kg.

Variable overheads per machine hours Machine P: Rs. 80

Machine Q: Rs. 100

Required

(i) IDENTIFY the spare part which will optimize contribution at the offered price.

(ii) If Y Ltd. reduces target price by 10% and offers Rs. 60 per hour of unutilized machine hour, CALCULATE the total contribution from the spare part identified above?

Solution

	Part A	**Part B**
Machine "P" (4000 Hrs)	6,666	16,000
Machine "Q" (4,500 Hrs)	9,000	8,181
Alloy Available (13,000 Kg)	8,125	8,125
Maximum number of Parts to be manufactured (minimum of above three)	6,666	8,125
Material (Rs.12.50 x 1.6 KG)	20.00	20.00

Variable Overhead: Machine "P" @ Rs.80	48.00	20.00
Variable Overhead: Machine "Q" @ Rs.100	50.00	55.00
Total Variable Cost per unit	118.00	95.00
Price Offered	145.00	115.00
Contribution per unit	27.00	20.00
Total Contribution	1,79,982	1,62,500

Spare Part A will optimize the contribution

(ii)

	Part A
Parts to be manufactured numbers	6,666
Machine P : to be used X 0.60 hour per unit	4,000
Machine Q : to be used X 0.50 hour per unit	3,333
Underutilized Machine Hours (4,500 hrs. – 3,333 hrs.)	1,167

Statement showing total contribution

Particulars	Part A
Total Existing contribution	1,79,982
Add:- Benefit by hiring unutilized hours i.e. 1167 hours x Rs.60	70,020
Less:- Reduction in Contribution due to reduction in price 6666 units X Rs.14.50	(96,657)
Total Contribution	1,53,345

Question 3

XY Ltd. makes two products X and Y, whose respective fixed costs are F1 and F2. You are given that the unit contribution of Y is one fifth less than the unit contribution of X, that the total of F 1 and F2 is Rs.1,50,000, that the BEP of X is 1,800 units (for BEP of X, F2 is not considered) and that 3,000 units is the indifference point between X and Y. (i.e. X and Y make equal profits at 3,000 unit volume, considering their respective fixed costs). There is no inventory buildup as whatever is produced is sold.

Required

FIND OUT the values F1 and F2 and units contributions of X and Y.

Solution

Information given in Question is summarised below:

Particulars	Product X	Product Y	Special Remarks
Fixed Cost	F1	F2	
Contribution Per Unit	Rs.C per unit (Assumed)	Rs.C per unit X 0.80	Qn says Contribution per unit of Product Y is 1/5th Less than that of product X Hence it shall be (1 – 1/5) i.e. 4/5 i.e. 0.80 of contribution per unit of product X.
Break Even Points	1800 units		

Indifference Point is 3000 units, it means Profit of 3000 units of product X and Profit of 3000 units of product Y is same.

As Question Says 1800 units of product X is Break Even Point, It means Profit is ZERO when 1800 units of product X is sold hence
Total Contribution – Total Fixed Cost = Total Profit
1800 units X Rs.C per unit – F1 = 0
1800C – F1 = 0
F1 = 1800C ----------**Equation 1**

We are also given that Total Fixed Cost of Both the product is Rs.1,50,000
Hence F1 + F2 = Rs.1,50,000
1800C + F2 = Rs.1,50,000
F2 = Rs.1,50,000 – 1800C ----------**Equation 2**

We are given in question that Indifference Point is 3000 units, it means Profit of 3000 units of product X and Profit of 3000 units of product Y is same.
Hence Profit of Product X at 3000 units = Profit of Y at 3000 units
Total Contribution – Total Fixed Cost = Total Contribution – Total Fixed Cost
3000 units X Rs. C per unit – F1 = 3000 units X Rs.0.80 C per unit – F2
3000 units X Rs. C per unit – 1800C = 3000 units X Rs.0.80 C per unit – (Rs.1,50,000 – 1800C)

3000C – 1800C = 2400C – Rs.1,50,000 + 1800C
1200C = 4200C - Rs.1,50,000
4200C – 1200C = Rs.1,50,000
3000C = Rs.1,50,000
C = Rs.1,50,000 / 3000 = Rs.50 Per unit

F1 = 1800C = 1800 x Rs.50 = Rs.90,000
F2 = Rs.1,50,000 – 1800C = Rs.1,50,000 – 1800 X Rs.50 = Rs.60,000
Unit Contribution of Product X = Rs.50 per unit
Unit Contribution of Product Y = 0.80C = 0.80 X Rs.50 = Rs.40 Per unit

Question 4
A company produces three products. The general manager has prepared the following draft budget for the next year.

	Product A	Product B	Product C
No. of units	30,000	20,000	40,000
Selling price per unit (Rs.)	40	80	20
P/V Ratio	20%	40%	10%
Raw material cost as a % of sales value	40%	35%	45%
Maximum Sales potential in Units	40,000	30,000	50,000

The company incurs Rs. 1,00,000 per annum towards fixed cost. The company uses the same raw material in all the three products and the price of raw material is Rs. 2 per kg.

The draft budget makes full utilization of the available raw material which is in short supply. The managing director is not satisfied with the budgeted profitability and hence he has passed on the aforesaid draft budget to you for review. **Required:**

1) Set an optimal product mix for the next year and finds its profit.
2) The company has been able to locate a source for purchase of additional material 20,000 kgs at an enhanced price. The transport cost for the additional raw material is Rs. 10,000. What is the maximum price per kg.which can offered by the company for additional supply of raw material.

Solution:

(1) Calculation of available quantity of raw material (Based on budget)

Product	Selling price per unit (Rs.)	Material cost (%)	Material cost (Rs.)	Mat. Requirement per unit@Rs. 2 per kg	Sales budget	Raw material (Qty)
A	40	40%	16	8 kg	30000 units	240000 kg
B	80	35%	28	14 kg	20000 units	280000 kg
C	20	45%	9	4.50 kg	40000 units	180000 kg
Total						700000 kg

Total available raw material = 700000 kg

(2) Statement showing Rank

Particulars	A	B	C
Selling price per unit	40	80	20
P/V Ratio	20%	40%	10%
Contribution per unit	8	32	2
Material required per unit (Kg)	8 kg	14 kg	4.50 kg
Contribution per kg	Rs. 1	Rs. 2.29	Rs. 0.44
Rank	II	I	III

(3) **Allocation of available 700000 kg material**

Product	Rank	Demand	Material required per unit	Required material	Allotted material
A	II	40000	8 kg	320000 kg	280000 kg (bal.)
B	I	30000	14 kg	420000 kg	420000 kg
C	III	50000	4.50 kg	225000 kg	---
Total					700000 Kg

possible production of A = $\frac{280000\ kg}{kg}$ = 35000 units

Best production mix

A = 35000 units B = 30000 units

Profit = Contribution – Fixed Cost = (35000 units x Rs.8 + 30000 units x Rs.2) – 100000 = 11,40,000

(2a) Total demand of product A = 40000 units
Less existing supply of A = (35000 units)
Balance demand = 5000 units

Possible production with additional 20000 kg = $\frac{20000\ kg}{8\ kg}$ = 2500 units

Selling price of A = Rs. 40
Less Contribution = (Rs.8)
Variable Cost per unit = Rs. 32
Less Material cost (8 kg x Rs. 2) = (Rs. 16)
Other variable cost per unit = **Rs. 16**u

Sale value of 2500 units of A= Max cost of material + freight + other variable cost + additional fixed cost + profit

2500 units x Rs. 40 = Max. Material cost + 10000 + (2500 units x Rs. 16)
Max. material cost = Rs. 50000

Max offer price per kg = $\frac{Rs.50000}{20000\ kg}$ = Rs. 2.50 per kg

BUDGETS AND BUDGETARY CONTROL

Question 1

Concorde Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

	Product-A	Product-B
Budgeted sales (in units)	2,400	3,600
Budgeted material consumption per unit (in kg):		
Material-X	5	3
Material-Y	4	6
Standard labour hours allowed per unit of product	3	5

Material-X and Material-Y cost Rs. 4 and Rs. 6 per kg and labours are paid Rs. 25 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 180 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%. In addition the non-productive down-time is budgeted at 20% of the productive hours worked.

There are four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product-A	400 units
Product-B	200 units
Material-X	1,000 kg.
Material-Y	500 kg.

The anticipated closing stocks for budget period are as below:

Product-A	4 days sales
Product-B	5 days sales
Material-X	10 days consumption
Material-Y	6 days consumption

Required:

Calculate the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month.

Solution

Number of days in budget period = 4 weeks × 5 days = 20 days

Number of units to be produced

	Product-A (units)	Product-B (units)
Budgeted Sales	2,400	3,600
Add: Closing stock $\frac{2400\ units X\ 4\ days}{20\ days}$ $\frac{3600\ units X\ 5\ days}{20\ days}$	480	900
Less: Opening stock	400	200
Budgeted production of FG	**2,480**	**4,300**

(i) Material Purchase Budget

	Material-X (Kg.)	Material-Y (Kg.)
Material to be consumed in production of FG		
Product-A	12,400 (2,480 units × 5 kg.)	9,920 (2,480 units × 4 kg)
Product-B	12,900 (4,300 units × 3 kg.)	25,800 (4,300 units × 6 kg.)
	25,300	**35,720**
Add: Closing stock $\frac{25{,}300\ kgs X\ 10\ days}{20\ days}$ $\frac{35{,}720\ kgs X\ 6\ days}{20\ days}$	12,650	10,716
Less: Opening stock	1,000	500
Quantity to be purchased	36,950	45,936
Rate per kg. of Material	Rs4	Rs6
Total Cost to be incurred	Rs1,47,800	Rs2,75,616

(ii) **Wages Budget**

	Product-A (Hours)	Product-B (Hours)
Units to be produced	2,480 units	4300 units
Standard hours allowed per unit	3	5
Total Standard Hours allowed	7,440	21,500 hrs
Actual hours required for production (Efficiency Ratio (80%) = $\frac{\text{STANDARD HOURS}}{\text{ACTUAL HOURS}}$	$\frac{7{,}440\ \text{hrs}}{80\%}$ = 9,300	$\frac{21{,}500\ \text{hrs}}{80\%}$ = 26,875
Add: Non-Productive down time (20% of Actual Hours Required)	1,860 hours (20% of 9,300 hrs)	5,375 hours. (20% of 26,875 hrs)
Hours to be paid	**11,160**	**32,250**

Total Hours to be paid = 43,410 hours (11,160 + 32,250)
Normal Hours to be paid at normal rate = 4 weeks × 40 hours × 180 workers = 28,800 hours
Overtime Hours to be paid at premium rate = 43,410 hours – 28,800 hours = 14,610 hours
Total wages to be paid = 28,800 hours × Rs. 25 + 14,610 hours × Rs. 37.50
= Rs7,20,000 +Rs5,47,875
= Rs. 12,67,875

Question 2: A single product company estimated its sales for the next year quarter-wise as under :

Quarter	Sales (Units)
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 10,000 units and the company expects to maintain the closing stock of finished goods at 16,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg. and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg. of raw materials.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below:

Quarter	Purchase of raw materials % to total annual requirement in quantity (Rs.)	Price per kg. (Rs.)
I	30%	2
II	50%	3
III	20%	4

The value of the opening stock of raw materials in the beginning of the year is Rs. 20,000. You are required to present the following for the next year, quarter wise :
(i) Production budget (in units).
(ii) Raw material consumption budget (in quantity).
(iii) Raw material purchase budget (in quantity and value).
(iv) Priced stores ledger card of the raw material using First in First out method.

Solution
Working Note

Total Annual Production (in units)

Sales in 4 quarters	1,53,750 units
Add : Closing balance	16,250 units
	1,70,000 units
Less : Opening balance	(10,000) units
Total number of units to be produced in the next year	1,60,000

(i) Production Budget (in units)

	Quarters				
	I Units	*II Units*	*III Units*	*IV Units*	*Total Units*
Sales	30,000	37,500	41,250	45,000	1,53,750
Production in current quarter *(80% of the sale of current quarter)*	24,000	30,000	33,000	36,000	
Production for next quarter *(20% of the sale of next quarter)*	7,500	8,250	9,000	12,250*	
Total production	31,500	38,250	42,000	48,250*	1,60,000

* Difference figure

(ii) Raw material consumption budget in quantity

	Quarters				Total
	I	*II*	*III*	*IV*	
Units to be produced in each quarter: (A)	31,500	38,250	42,000	48,250	1,60,000
Raw material con-sumptionp.u. (kg.): (B)	2	2	2	2	
Total raw material consumption (Kg.) : (A × B)	63,000	76,500	84,000	96,500	3,20,000

(iii) Raw material purchase budget (in quantity) - Annually

Raw material to be Consumedin production (kg.)	3,20,000
Add : Closing stock of raw material (kg.)	5,000
Less :Opening stock (kg.)	(10,000)
Material to be purchased (kg.)	3,15,000

Raw materialpurchase budget (in value) - Annually

Quarters	*% of annual require-ment (Qty.) for pur-chasing raw material (kg.)*	*Quantity of raw material to be purchased*	*Rate per kg. (Rs)*	*Amount (Rs)*
I	30	94,500 (3,15,000 kg. × 30%)	2	1,89,000
II	50	1,57,500 (3,15,000 kg. × 50%)	3	4,72,500
III	20	63,000 (3,15,000 kg. × 20%)	4	2,52,000
Total :		3,15,000		9,13,500

(iv) Priced Store Ledger Card (FIFO Method)

	Quarter I			Quarter 2			Quarter 3			Quarter 4		
	Kg.	Rate (Rs.)	Value (Rs.)	Kg.	Rate (Rs.)	Value (Rs.)	Kg.	Rate (Rs.)	Value (Rs.)	Kg.	Rate (Rs.)	Value (Rs.)
Opening Bal.	10000	2	20000	41500	2	83000	122500	3	367500	38500	3	115500
(A)										63000	4	252000
Purchases (B)	94500	2	189000	157500	3	472500	63000	4	252000			
Consumption (C)	63000	2	126000	41500	2	83000	84000	3	252000	38500	3	115500
				35000	3	105000	38500	3	115500	58000	4	232000
Balance	41500	2	83000	122500	3	367500	63000	4	252000	5000	4	20000

Question 3

Following Data is available for XYZ Ltd.

Standard Working hours	8 hours per day of 5 days per week
Maximum Capacity	60 employees
Actual Working	50 employees
Actual hours expected to be worked per four week	8000 hours
Standard hours expected to be earned per four week	9600 hours
Actual hours worked in the four week period	7500 hours
Standard hours earned in the four week period	8800 hours

The related period of is 4 weeks. In this period, there was one special day holiday due to national event. Calculate following ratios

1. Efficiency Ratio
2. Activity ratio
3. Standard Capacity Usage Ratio
4. Actual Capacity Usage Ratio
5. Actual Usage of Budgeted Capacity Ratio
6. Calendar Ratio

Solution Following Data is available for ABC

		Analysis	Tech. Term
Standard working Hours	8 hours per day of 5 days per week	A worker "should" work for 5 days in a week and 8 hours in a day.	
Maximum capacity	60 employees	Max. 60 workers can work in this Co.	
Actual Working	50 Employees	Actually 50 workers worked	
Actual hours expected to be worked per four week	8000 Hours	50 workers "should" work for 8000 hours in this month. 50 Workers x 4 week x 5 days x 8 hours = 8000 Hours	Budgeted Hours
Standard hours expected to be earned per four week	9600 Hours	If 60 workers work then those 60 workers "should" work for 9600	Maximum Hours

		hours in this month. 60 Workers x 4 week x 5 days x 8 hours = 9600 Hours It is Maximum Hours	
Actual Hours Worked in the four week Period	7500 Hours	50 workers "Actually" worked for 7500 hours in this month.	Actual Hours
Standard Hours earned in the four week period	8800 hours		Standard Hours

The period is of 4 weeks.

(i) Efficiency Ratio = $\frac{Standard\ Hours}{Actual\ Hours}$ x 100 = $\frac{8800\ Hours}{7500\ Hours}$ x 100 = 117.33%

(ii) Activity Ratio = $\frac{Standard\ Hours}{Budgeted\ Hours}$ x 100 = $\frac{8800\ Hours}{8000\ Hours}$ x 100 = 110%

(iii) Standard Capacity Usage Ratio =

$\frac{Budgeted\ Hours}{Maximum\ possible\ hours\ in\ the\ budget\ period}$ x 100 = $\frac{8000\ Hours}{9600\ Hours}$ x 100 = 83.33%

(iv) Actual Capacity Usage Ratio =

$\frac{Actual\ Hours\ Worked}{Max.Possible\ working\ hours\ in\ a\ period}$ x 100 = $\frac{7500\ Hours}{9600\ Hours}$ x 100 = 78.125%

(v) Actual Usage of Budgeted Capacity Ratio

= $\frac{Actual\ Working\ Hours}{Budgeted\ Hours}$ x 100 = $\frac{7500\ Hours}{8000\ Hours}$ x 100 = 93.75%

(vi) Calendar Ratio = $\frac{\text{Available working days}}{\text{Budgeted working days}}$ x 100 = 19 days / 20 days = 95%