

***CA INTERMEDIATE***

***COST***

***&***

***MANAGEMENT ACCOUNTING***

***“TEST BOOK”***

***By***

***CA NAMIT ARORA SIR***

***“TEST YOUR KNOWLEDGE HERE”***

***ALL THE BEST***  
***CA. NAMIT ARORA***

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**TEST 1 - MATERIAL COST****Question 1**

A Company uses three raw materials A, B, and C for a particular product for which the following data apply:

RM	Usage for one unit of product	ROQ (in kg)	Price per kg	Delivery period (in weeks)			ROL (in kg)	Mini. level
				Mini.	Average	Max.		
A	10 kg	10,000	0.10	1	2	3	8,000	-
B	4 kg	5,000	0.30	3	4	5	4,750	-
C	6 kg	10,000	0.15	2	3	4	-	2,000 kg

Weekly production varies from 175 to 225 units, averaging 200 units of the said product.

What would be the following quantities?

(i) Minimum stock of A (ii) Maximum stock of B (iii) Re-order level of C (iv) Average stock level of A

**(10 Marks)**

**Question 2**

M/s Tubes Ltd. are the manufacturers of picture tubes for T.V. The following are the details of their operation during 1997:

Average monthly market demand	2,000 Tubes
Ordering cost	₹100 per order
Inventory carrying cost	20% per annum
Cost of tubes	₹500 per tube
Normal usage	100 tubes per week
Minimum usage	50 tubes per week
Maximum usage	200 tubes per week
Lead time to supply	6 - 8 weeks

Compute from the above:

- (1) Economic order quantity. If the supplier is willing to supply 1,500 units at a discount of 5%, is it worth accepting?
- (2) Maximum level of stock.
- (3) Minimum level of stock.
- (4) Re-order level.

**(5+2+2+1= 10 Marks)**

**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 ₹800 per casting.

The castings are used evenly throughout the year in the production process on a 360-day-per-year basis. The company estimates that it costs ₹9,000 to place a single purchase order and about ₹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

- (i) Compute the economic order quantity (EOQ).
- (ii) 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?

- (iii) 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?
- (iv) Assume 5% stock-out risk. What would be the total cost of ordering and carrying inventory for one year?
- (v) Refer to the original data. Assume that using process re-engineering the company reduces its cost of placing a purchase order to only ₹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 ₹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?

**(2 + 1 + 1 + 2 + 4 = 10 Marks)**

**SOLUTION TEST 1 - MATERIALS COST****Solution 1**

(i) Minimum stock of A = ROL - (Average usage × Average lead time)  
 = 8,000 kg - [(200 units × 10 kg) × 2 weeks] = 4,000 kg

(ii) Maximum stock of B = ROL - (Minimum usage × Minimum lead time) + ROQ  
 = 4,750 - [(175 units × 4 kg) × 3 weeks] + 5,000  
 = 9,750 - 2,100 = 7,650 kg

(iii) Re-order Level of C = Minimum stock of C + (Average usage × Average lead time)  
 = 2,000 + [(200 units × 6kg) × 3 weeks] = 5,600 kg

(iv) Average level of A = Minimum stock level + ½ ROQ  
 = 4,000 + ½ × 10,000  
 = 4,000 + 5,000 = 9,000 kg

Or

=  $\frac{\text{Minimum stock} + \text{Maximum stock}}{2}$   
 =  $\frac{4,000 + 16,250}{2}$  = 10,125 kg

Working Notes:

Max. Stock of A = ROL (Minimum usage × Minimum re-order period) + ROQ  
 = 8,000 kg - [(175 units × 10 kg) × 1 week] + 10,000 = 16,250 kg

**Solution 2**

(1) EOQ =  $\sqrt{\frac{2AO}{C}}$  =  $\sqrt{\frac{2 \times 5,200 \times 100}{500 \times 20\%}}$  = 102 tubes  
 approx.

\*A = Normal usage per week × 52 week  
 = 100 tubes × 52 weeks = 5,200 tubes.

Statement Showing Net Benefit

Particulars	₹
(A) Cost (when order size 102 tubes)	
Purchase Cost 5,200 tubes @ 500 per tube	26,00,000
Ordering Cost [(5,200/102) 50.98 or 51 orders × 100]	5,100
Carrying Cost (102 × 500 × ½ × 20%)	5,100
Total Cost (A)	26,10,200
(B) Cost (when order size 1,500 units)	
Purchase Cost 5,200 tubes @ 475 (500 × 95%) per tube	24,70,000
Ordering Cost [(5,200/1,500) 3.46 or 4 orders × 100]	400
Carrying Cost (1,500 × 475 × ½ × 20%)	71,250
Total Cost (B)	25,41,650
Net benefit (A- B)	68,550

Advice: Yes, M/s Tubes Ltd. should accept the discount offer.

(2) Maximum Level of Stock = ROL + Re-order quantity - (Min. Usage × Min. Re-order Period)  
 = 1,600 tubes + 102 tubes - (50 tubes per week × 6 weeks)  
 = 1,402 tubes

(3) Minimum Level of Stock = Re-order Level - (Normal Usage × Average Re-order Period)  
 = 1,600 tubes - (100 tubes per week × 7 weeks)

$$= 900 \text{ tubes}$$

$$\begin{aligned} (4) \text{ Reorder Level} &= \text{Maximum Consumption} \times \text{Maximum Re-order Period} \\ &= 200 \text{ tubes per week} \times 8 \text{ weeks} = 1,600 \text{ tubes} \end{aligned}$$

**Solution 3**

(i) Computation of economic order quantity (EOQ):

$$\text{EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 54,000 \times 9,000}{300}} = 1,800 \text{ castings}$$

(ii) Assuming a 15% risk of being out of stock:

From the probability table given in the question, we can see that 85% certainty in delivery time is achieved when delivery period is 7 days i.e. at 15% risk level of being out of stock, the maximum delivery period should not exceed 7 days.

$$\begin{aligned} \text{Safety stock} &= \frac{\text{Annual Demand}}{360} \times (\text{Maximum lead time} - \text{Average lead time}) \\ &= \frac{54,000}{360} \times (7 \text{ days} - 6 \text{ days}) = 150 \text{ castings} \\ \text{Re-order point} &= \text{Safety stock} + \text{Average lead time consumption} \\ &= 150 \text{ castings} + (6 \text{ days} \times 150 \text{ casting}) = 1,050 \text{ castings} \end{aligned}$$

(iii) Assuming a 5% risk of being out of stock:

From the probability table given in the question, we can see that 95% certainty in delivery time is achieved when delivery period is 9 days i.e. at 5% risk level of being out of stock, the maximum delivery period should not exceed 9 days.

$$\begin{aligned} \text{Safety stock} &= \frac{\text{Annual Demand}}{360} \times (\text{Maximum lead time} - \text{Average lead time}) \\ &= \frac{54,000}{360} \times (9 \text{ days} - 6 \text{ days}) = 450 \text{ castings} \\ \text{Re-order point} &= \text{Safety stock} + \text{Average lead time consumption} \\ &= 450 \text{ castings} + (6 \text{ days} \times 150 \text{ casting}) = 1,350 \text{ castings} \end{aligned}$$

(iv) At 5% stock-out risk the total cost of ordering and carrying cost is as follows:

$$\begin{aligned} \text{Total cost of ordering} &= \frac{\text{Annual Demand}}{\text{EOQ}} \times \text{Cost per order} \\ &= \frac{54,000}{1,800} \times ₹9,000 = ₹2,70,000 \\ \text{Total cost of carrying} &= (\text{Safety stock} + \frac{1}{2} \text{EOQ}) \times \text{Carrying cost per unit p.a.} \\ &= (450 \text{ units} + \frac{1}{2} \times 1,800 \text{ units}) \times ₹300 = ₹4,05,000 \end{aligned}$$

$$(v) \text{ (a) Computation of new EOQ} = \sqrt{\frac{2 \times 54,000 \times 600}{720}} = 300 \text{ castings}$$

$$(b) \text{ Total number of orders to be placed in a year} = \frac{54,000}{300} = 180 \text{ orders}$$

Under new purchasing policy IPL Ltd. has to place order in every 2<sup>nd</sup> day (360 days ÷ 180 orders), however under the old purchasing policy it was every 12<sup>th</sup> day.

## TEST 2 – EMPLOYEE COST

### Question 1

Mr. A is working by employing 10 skilled workers. He is considering the introduction of some incentive scheme either Halsey scheme (with 50% bonus) or Rowan scheme of wage payment for increasing the labour productivity to cope with the increased demand for the product by 25%. He feels that if the 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 and he has accordingly given this assurance to the workers.

As a result of the assurance, the increase in productivity has been observed as revealed by the following figures for the current month:

Hourly rate of wages (guaranteed)	₹40.00
Average time for producing 1 piece by one worker based on the previous performance (This may be taken as time allowed)	2 hours
No. of working days in the month	25 days
No. of working hours per day for each worker	8 hours
Actual production during the month	1,250 units

Required:

1. Calculate effective rate of earnings per hour under Halsey scheme and Rowan scheme.
2. Calculate the savings to Mr. A in terms of direct labour cost per piece under the schemes.
3. Advise Mr. A about the selection of the scheme to fulfill his assurance.

**(10 Marks)**

### Question 2

A skilled worker in XYZ Ltd. is paid a guaranteed wage rate of ₹30 per hour. The standard time per unit for a particular product is 4 hours. Mr. P, a machine man, has been paid wages under the Rowan Incentive Plan and he had earned an effective hourly rate of ₹37.50 on the manufacture of that particular product.

What could have been his total earnings and effective hourly rate, had he been put on Halsey Incentive Scheme (50%)?

**(5 Marks)**

### Question 3

Calculate the earning of A and B from the following particulars for a month and allocate the labour cost to each job X, Y and Z:

	A	B
Basic wages	₹10,000	₹16,000
Dearness Allowance	50%	50%
Contribution to Provident Fund (on basic wages)	8%	8%
Contribution to Employee State Insurance (on basic wages)	2%	2%
Overtime hours	10 hours	-

The normal working hours for the month are 200. Overtime is paid at double the total of normal wages and dearness allowance. Employer's contributions to state insurance and provident fund are at equal rates with employee's contribution. The two workers were employed on jobs X, Y and Z in the following proportions:

Jobs	X	Y	Z
Workers A	40%	30%	30%
Workers B	50%	20%	30%

Overtime was done on Job Y.

**(10 Marks)**

**SOLUTION TEST 2 – EMPLOYEE COST****Solution 1**

1. Computation of effective rate of earnings under the Halsey and Rowan schemes:

Total earnings under Halsey scheme	=	$(AH \times R) + 50\% (SH - AH) \times R$	
	=	$(2,000 \times ₹40) + 50\% (2,500 - 2,000) \times ₹40$	
	=	₹90,000	
Total earnings under Rowan scheme	=	$(AH \times R) + \frac{AH}{SH} \times (SH - AH) \times R$	
	=	$(2,000 \times ₹40) + \frac{2,000}{2,500} \times (2,500 - 2,000) \times ₹40$	
	=	₹96,000	
Effective rate under Halsey Plan	=	$₹90,000 \div 2,000 \text{ hours}$	= ₹45 per hour
Effective rate under Rowan Plan	=	$₹96,000 \div 2,000 \text{ hours}$	= ₹48 per hour
Actual hours (AH)	=	$10 \text{ workers} \times 25 \text{ days} \times 8 \text{ hours per day}$	
	=	2,000 hours	
Standard hours (SH)	=	$1,250 \text{ units} \times 2 \text{ hours per unit}$	= 2,500 hours

2. Savings to Mr. A in terms of direct labour cost per piece:

Direct labour cost per unit:

Under time wages	=	$2 \text{ hours} \times ₹40 \text{ per hour}$	=	₹80 per unit
Under Halsey Plan	=	$₹90,000 \div 1,250 \text{ units}$	=	₹72 per unit
Under Rowan Plan	=	$₹96,000 \div 1,250 \text{ units}$	=	₹76.8 per unit

Savings of direct labour cost per unit under:

Halsey Plan	=	$₹80 - ₹72$	=	₹8.00 per unit
Rowan Plan	=	$₹80 - ₹76.80$	=	₹3.20 per unit

3. Advise to Mr. A about the selection of the scheme to fulfill assurance: Halsey scheme brings more savings to Mr. A but the other scheme viz. Rowan fulfils the promise of 20% increase over the present earnings of ₹40 per hour by paying effectively ₹48 per hour. Hence, Rowan Plan should be adopted.

**Solution 2**

The following equation can be made:

Effective Earnings per hour	=	$[(AH \times R) + AH/SH (SH - AH) \times R] \div AH$
37.50	=	$[30 AH + AH/4 (4 - AH) \times 30] \div AH$
37.50 AH	=	$30 AH + AH/4 (4 - AH) \times 30$
7.50 AH	=	$AH/4 (4 - AH) \times 30$
7.50 AH	=	$AH (4 - AH) \times 7.50$
1	=	$4 - AH$
AH	=	3 hours

Total earnings and effective hourly rate of skilled worker under Halsey Incentive Scheme:

Total earnings	=	$(AH \times R) + 50\% (SH - AH) \times R$	
	=	$(3 \times 30) + 50\% (4 - 3) \times 30$	= ₹105
Effective hourly rate	=	Total earning $\div$ hours worked	

$$= ₹105 \div 3 \text{ hours}$$

$$= ₹35$$

**Solution 3**

Statement Showing Earning of Worker A and B

Particulars	A	B
Basic Wages	10,000	16,000
Dearness Allowance (50% of Basic)	5,000	8,000
Overtime Wages (W.N.)	1,500	-
Gross Wages Earned	16,500	24,000
Less: Employee's Contribution to Provident Fund (8% of basic)	(800)	(1,280)
Less: Employee's Contribution ESI (2% of basic)	(200)	(320)
Net Wages Earned	15,500	22,400

Statement Showing Labour Cost Chargeable to Jobs

Particulars	Job X	Job Y	Job Z
Worker A:			
Ordinary Wages 16,000 in 4 : 3 : 3	6,400	4,800	4,800
Overtime 1,500 for Job Y	-	1,500	-
Worker B:			
Ordinary Wages 25,600 in 5 : 2 : 3	12,800	5,120	7,680
Labour Cost chargeable	19,200	11,420	12,480

Working Note:

## 1. Statement Showing Labour Cost Excluding Overtime

Particulars	A	B
Basic Wages	10,000	16,000
Dearness Allowance (50% of Basic)	5,000	8,000
Add: Employer's Contribution to Provident Fund (8% of basic)	800	1,280
Add: Employer's Contribution ESI (2% of basic)	200	320
Net Wages Earned	16,000	25,600

$$2. \text{ Overtime wages of worker A} = (15,000 \div 200 \text{ hours}) \times 10 \text{ hours} \times 2 = 1,500$$

### TEST 3 – OVERHEADS

#### Question 1

The ABC Company has the following account balances and distribution of direct charges on 31st March, 2017.

Items	Total Amount	Production Department		Services Departments	
		Machine Shop	Packing	General Plant	Stores & maintenance
Allocated overheads:					
Indirect labour	14,650	4,000	3,000	2,000	5,650
Maintenance materials	5,020	1,800	700	1,020	1,500
Misc. supplies	1,750	400	1,000	150	200
Superintendent's salary	4,000	-	-	4,000	-
Cost & payroll salary	10,000	-	-	10,000	-
OH to be apportioned:					
Power	8,000				
Rent	12,000				
Fuel & heat	6,000				
Insurance	1,000				
Taxes	2,000				
Depreciation	1,00,000				

The following data were compiled by means of the factory survey made in the previous year:

Details	Floor space in Sq. ft.	Radiator sections	No. of employees	Investment in ₹	H.P. hours
Machine shop	2,000	45	20	6,40,000	3,500
Packing	800	90	10	2,00,000	500
General plant	400	30	3	10,000	-
Store & maintenance	1,600	60	5	1,50,000	1,000
Total	4,800	225	38	10,00,000	5,000

Expenses charged to the stores and maintenance departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%; General Plant overheads is distributed on the basis of number of employees:

Requirements:

- Prepare an overhead distribution statement with supporting schedules to show computations and basis of distribution including distribution of the service department expenses to producing department.
- Determine the service department distribution by the method of continued distribution. Carry through 3 cycles. Show all calculations to the nearest rupees.

**(10 Marks)**

#### Question 2

A manufacturing unit has purchased and installed a new machine of ₹12,70,000 to its fleet of 7 existing machines. The new machine has an estimated life of 12 years and is expected to realise ₹70,000 as scrap at the end of its working life.

Other relevant data are as follows:

- Budgeted working hours are 2,592 based on 8 hours per day for 324 days. This includes 300 hours for plant maintenance and 92 hours for setting up of plant.
- Estimated cost of maintenance of the machine is ₹25,000 p.a.
- The machine requires a special chemical solution, which is replaced at the end of each week (6 days in a week) at a cost of ₹400 each time.
- Four operators control operation of 8 machines and the average wages per person amounts to ₹420 per week plus 15% fringe benefits.

- (v) Electricity used by the machine during the production is 16 units per hour at a cost of ₹3 per unit. No current is taken during maintenance and setting up.
- (vi) Departmental and general works overhead allocated to the operation during last year was ₹50,000. During the current year it is estimated to increase 10% of this amount.

Calculate machine hour rate, if (a) setting up time is unproductive; (b) setting up time is productive.

(5 Marks)

### Question 3

The total overhead expenses of a factory are ₹4,46,380. Taking into account the normal working of the factory, overhead was recovered in production at ₹1.25 per hour. The actual hours worked were 2,93,104.

How would you proceed to close the books of accounts, assuming that besides 7,800 units produced of which 7,000 were sold, there were 200 equivalent units in work-in-progress?

On investigation, it was found that 50% of the unabsorbed overhead was on account of increase in the cost of indirect materials and indirect labour and the remaining 50% was due to factory inefficiency.

Also give the profit implication of the method suggested.

(10 Marks)

### Question 4

E-books is an online book retailer. The Company has four departments. The two sales departments are Corporate Sales and Consumer Sales. The two support departments are Administrative (Human resources, Accounting) and Information systems. Each of the sales department conducts merchandising and marketing operations independently.

The following data are available for October, 2003:

Departments	Revenues	Number of Employees	Processing Time used (in minutes)
Corporate Sales	₹16,67,750	42	2,400
Consumer Sales	₹8,33,875	28	2,000
Administrative	-	14	400
Information systems	-	21	1,400

Cost incurred in each of four departments for October, 2003 are as follows:

Corporate sales	₹12,97,751
Consumers sales	₹6,36,818
Administrative	₹94,510
Information systems	₹3,04,720

The company uses number of employees as a basis to allocate Administrative costs and processing time as a basis to allocate Information systems costs.

Required:

- (i) Allocate the support department costs to the sales departments using the direct method.
- (ii) Rank the support departments based on percentage of their services rendered to other support departments. Use this ranking to allocate support costs based on the step-down allocation method.
- (iii) How could you have ranked the support departments differently?
- (iv) Allocate the support department costs to two sales departments using the reciprocal allocation method.

(10 Marks)

**SOLUTION TEST 3 – OVERHEADS****Solution 1**

## (a) Overhead Distribution Statement

Items	Total Amount	Production Department		Services Departments	
		Machine Shop	Packing	General Plant	Stores & maintenance
Allocated overheads:					
Indirect labour	14,650	4,000	3,000	2,000	5,650
Maintenance materials	5,020	1,800	700	1,020	1,500
Misc. supplies	1,750	400	1,000	150	200
Superintendent's salary	4,000	-	-	4,000	-
Cost & payroll salary	10,000	-	-	10,000	-
Apportioned overheads (see schedule below)	1,29,000	77,720	25,800	2,830	22,650
<b>Total</b>	<b>1,64,420</b>	<b>83,920</b>	<b>30,500</b>	<b>20,000</b>	<b>30,000</b>

## Statement of Apportioned Expenses

Items	Basis	Production Department		Services Departments	
		Machine Shop	Packing	General Plant	Stores & maintenance
Power	H.P. hours	5,600	800	-	1,600
Rent	Floor space	5,000	2,000	1,000	4,000
Fuel & heat	Radiator secs.	1,200	2,400	800	1,600
Insurance	Investment	640	200	10	150
Taxes	Investment	1,280	400	20	300
Depreciation	Investment	64,000	20,000	1,000	15,000
<b>Total</b>	<b>-</b>	<b>77,720</b>	<b>25,800</b>	<b>2,830</b>	<b>22,650</b>

## (b) Distribution of Service Department Expenses

Items	Basis	Production Department		Services Departments	
		Machine Shop	Packing	General Plant	Stores & maintenance
Total Expenses	[as per (a)]	83,920	30,500	20,000	30,000
Re-apportionment:					
Expenses of General plant	20 : 10 : 5	11,429	5,714	(20,000)	2,857
Expenses of Stores & maintenance	50 : 20 : 30	16,429	6,571	9,857	(32,857)
Expenses of General plant	20 : 10 : 5	5,633	2,816	(9,857)	1,408
Expenses of Stores & maintenance	50 : 20 : 30	704	282	422	(1,408)
Expenses of General plant	20 : 10 : 5	241	121	(422)	60
Expenses of Stores & maintenance	50 : 20	43	17	-	(60)
<b>Total</b>	<b>-</b>	<b>1,18,399</b>	<b>46,021</b>	<b>-</b>	<b>-</b>

**Solution 2**

$$\text{Machine Hour Rate} = \frac{\text{Total Cost}}{\text{Productive Hours}}$$

$$(a) \text{ Setting up time is unproductive} = 2,72,116 \div 2,200 = ₹123.69 \text{ per hour}$$

$$(b) \text{ Setting up time is productive} = 2,72,116 \div 2,292 = ₹118.72 \text{ per hour}$$

## Statement Showing Total Cost Related to Machine

Particulars	Amount
(A) Standing charges/ Fixed costs	

Depreciation	[(₹12,70,000 – 70,000) × 1/12 years]	1,00,000
Operators wages and fringe benefits	[(₹420 × 324/6 × 4 × 1/8) + 15%]	13,041
Departmental and general overheads	[(₹50,000 + 10%) × 1/8]	6,875
Total (A)		1,19,916
(B) Running charges/ Variable costs		
Maintenance		25,000
Electricity	(16 units × 2,200 hours × ₹3)	1,05,600
Special oil	(₹400 × 324/6)	21,600
Total (B)		1,52,200
Total Cost (A + B)		2,72,116

**Solution 3**

Calculation of Unabsorbed Overheads:

Particulars	Amount
Actual overhead incurred	4,46,380
Less: overhead absorbed (OH recovery ₹ per hour × Actual hours worked) ₹1.25 × 2,93,104 Hours	3,66,380
Unabsorbed OH	80,000

Unabsorbed OH on account of increase in cost (80,000 × 50%)	40,000
Unabsorbed OH on account of factory inefficiency (80,000 × 50%)	40,000

Treatment of Unabsorbed OH &amp; its implication on Profit:

- (i) The unabsorbed OH on account of increase in cost of indirect material & labour of ₹40,000 should be adjusted in the cost books by applying positive supplementary rates.

$$\text{Supplementary Rate} = \frac{\text{Unabsorbed OH}}{\text{Equivalent completed units of Production}}$$

Where, Equivalent completed units are as under:

Unit sold	7,000
Units in closing stock of Finished Goods (7,800-7,000)	800
Equivalent WIP units	200
Total Equivalent Completed Units	8,000 units

$$\text{Supplementary Rate} = \frac{40,000}{8,000 \text{ Units}} = ₹5 \text{ per unit}$$

The unabsorbed OH of ₹40,000 should be applied by using supplementary rate of ₹5 per equivalent completed unit proportionately on the basis of equivalent completed unit among Cost of Sales A/c, Stock of Finished Goods A/c, & WIP A/c as under:

Items	Equivalent completed units	Rate	Share of unabsorbed overheads
Cost of Sales A/c	7,000	₹5	₹35,000
Stock of Finished	800	₹5	₹4,000
WIP A/c	200	₹5	₹1,000
Total			₹40,000

The above treatments of unabsorbed OH will reduce the profit by ₹35,000, the amount by which the cost of sales has been increased. Moreover, the value of stock of Finished Goods & WIP will increase by ₹4,000 & ₹1,000 respectively.

- (ii) The unabsorbed OH of ₹40,000 due to factory inefficiency being in the nature of abnormal loss should be changed to costing P/L A/c & thereby the profit would be reduced by ₹40,000.

**Solution 4**

(i) Statement Showing Allocation of support department costs to the sales departments  
(By Using Direct Method)

Particulars	Basis	Sales departments		Support departments	
		Corporate	Consumer	Admin	IS
Total overheads		12,97,751	6,36,818	94,510	3,04,720
Apportionment of Expenses:					
Administrative Dept (42:28)	No. of employees	56,706	37,804	(94,510)	-
Information system (2,400:2,000)	Processing time	1,66,211	1,38,509	-	(3,04,720)
Total	-	15,20,668	8,13,131	-	-

(ii) Ranking of support departments based on percentage of their services rendered to other support departments:

$$\text{Services by Administrative to Information systems} = \frac{21}{42+28+21} \times 100 = 23.077\%$$

$$\text{Services by Information systems to Administrative} = \frac{400}{2,400+2,000+400} \times 100 = 8.333\%$$

Ranking as per percentage of services, Administrative as first and information system as second.

Statement Showing Allocation of Support Departments Costs  
(By Using Step-Down Method)

Particulars	Basis	Sales departments		Support departments	
		Corporate	Consumer	Admin	IS
Total overheads		12,97,751	6,36,818	94,510	3,04,720
Apportionment of Expenses:					
Administrative Dept (42:28:21)	No. of employees	43,620	29,080	(94,510)	21,810
Information system (2,400:2,000)	Processing time	1,78,107	1,48,423	-	(3,26,530)
Total	-	15,19,478	8,14,321	-	-

(iii) An alternative ranking is based on the rupee amount of services rendered to other service departments:

$$\text{Services by Administrative to Information systems} = \frac{21}{42+28+21} \times ₹94,510 = ₹21,810$$

$$\text{Services by Information systems to Administrative} = \frac{400}{2,400+2,000+400} \times ₹3,04,720 = ₹25,393$$

Ranking as per amount of services, information system as first and Administrative as second.

(iv) Statement Showing the Allocation of Support Department Costs to the Sales Departments  
(By Using Repeated Distribution Method)

Particulars	Basis	Sales departments		Support departments	
		Corporate	Consumer	Admin	IS
Total overheads		12,97,751	6,36,818	94,510	3,04,720
Apportionment of Expenses:					
Administrative Dept.	42:28:21	43,620	29,080	(94,510)	21,810
Information System Dept.	24:20:4	1,63,265	1,36,054	27,211	(3,26,530)
Administrative Dept.	42:28:21	12,559	8,373	(27,211)	6,279
Information System Dept.	24:20:4	3,140	2,616	523	(6,279)
Administrative Dept.	42:28:21	241	161	(523)	121
Information System Dept.	24:20:4	61	50	10	(121)
Administrative Dept.	42:28	6	4	(10)	-
Total	-	15,20,643	8,13,156	-	-

## TEST 4 – COST SHEET & UNIT COSTING

### Question 1

A Ltd. Co. has capacity to produce 1,00,000 units of a product every month. Its works cost at varying levels of production is as under:

Level	Works cost per unit (₹)
10%	400
20%	390
30%	380
40%	370
50%	360
60%	350
70%	340
80%	330
90%	320
100%	310

Its fixed administration expenses amount to ₹1,50,000 and fixed marketing expenses amount to ₹2,50,000 per month respectively. The variable distribution cost amounts to ₹30 per unit.

It can market 100% of its output at ₹500 per unit provided it incurs the following further expenditure:

- (a) It gives gift items costing Rs. 30 per unit of sale.
- (b) It has lucky draws every month giving the first prize of Rs. 50,000; 2nd prize of ₹25,000; 3rd prize of ₹10,000 and three consolation prizes of ₹5,000 each to customers buying the product.
- (c) It spends ₹1,00,000 on refreshments served every month to its customers.
- (d) It sponsors a television programme every week at a cost of ₹20,00,000 per month.

It can market 30% of its output at ₹550 per unit without incurring any of the expenses referred to in (a) to (d) above.

Prepare a cost sheet for the month showing total cost and profit at 30% and 100% capacity level.

**(5 Marks)**

### Question 2

M/s. Areeba private limited has a normal production capacity of 36,000 units of toys per annum. The estimated costs of production are as under:

- |   |   |
|---|---|
| (A) Direct material   | ₹40 per unit  |
| (B) Direct labour   | ₹30 per unit (subject to a minimum of ₹48,000 p.m.)   |
| (C) Factory overheads:  |   |
| Fixed   | ₹3,60,000 per annum   |
| Variable  | ₹10 per unit  |
| Semi variable   | ₹1,08,000 per annum up to 50% capacity and Additional ₹46,800 for every 20% increase in Capacity or any part thereof. |
| (D) Administrative overheads  | ₹5,18,400 per annum (fixed)   |
| (E) Selling overheads   | ₹8 per unit   |
| (F) Each unit of raw material yields scrap which is sold at the rate of ₹5 per unit.  |   |
| (G) In year 2019, the factory worked at 50% capacity for the first three month but it was expected that it would work at 80% capacity for the remaining nine month. |   |
| (H) During the first three months, the selling price per unit was ₹145.   |   |

You are required to:

- (1) Prepare a cost sheet showing prime cost, works cost, cost of production and cost of sales.

- (2) Calculate the selling price per unit for remaining nine month to achieve the total annual profit of ₹8,76,600.

(10 Marks)

**Question 3**

DFG Ltd. manufactures leather bags for office and school purpose. The following information is related with the production of leather bags for the month of September 2019.

- (i) Leather sheets and cotton cloths are the main inputs, and the estimated requirement per bag is two meters of leather sheets and one meter of cotton cloth. 2,000 meter of leather sheets and 1,000 meter of cotton cloths are purchased at ₹3,20,000 and ₹15,000 respectively. Freight paid on purchases is ₹8,500.
- (ii) Stitching and finishing need 2,000 man hours at ₹80 per hour.
- (iii) Other direct cost of ₹10 per labour hour is incurred.
- (iv) DFG has 4 machines at a total cost of ₹22,00,000. Machine has a life of 10 years with a scrape value of 10% of the original cost. Depreciation is charged on straight line method.
- (v) The monthly cost of administrative and sales office staffs are ₹45,000 and ₹72,000 respectively. DFG pays ₹1,20,000 per month as rent for a 2400 sq. feet factory premises. The administrative and sales office occupies 240 sq. feet and 200 sq. feet respectively of factory space.
- (vi) Freight paid on delivery of finished bags is ₹18,000.
- (vii) During the month 35 kg. of leather and cotton cuttings are sold at ₹150 per kg.
- (viii) There is no opening and closing stocks for input materials. There is 100 bags in stock at the end of the month.

Prepare a cost sheet following functional classification for the month of September 2019.

(10 Marks)

**Question 4**

The following details are available from the books of R Ltd. for the year ending 31st March 2020:

Particulars	Amount (₹)
Purchase of raw materials	84,00,000
Consumable materials	4,80,000
Direct wages	60,00,000
Carriage inward	1,72,600
Wages to foreman and store keeper	8,40,000
Other indirect wages to factory staffs	1,35,000
Expenditure on research and development on new production technology	9,60,000
Salary to accountants	7,20,000
Employer's contribution to EPF & ESI	7,20,000
Cost of power & fuel	28,00,000
Production planning office expenses	12,60,000
Salary to delivery staffs	14,30,000
Income tax for the assessment year 2019-20	2,80,000
Fees to statutory auditor	1,80,000
Fees to cost auditor	80,000
Fees to independent directors	9,40,000
Donation to PM-national relief fund	1,10,000
Value of sales	2,82,60,000
Position of inventories as on 01-04-2019:	
Raw Material	6,20,000
WIP	7,84,000
Finished goods	14,40,000
Position of inventories as on 31-03-2020:	
Raw Material	4,60,000
WIP	6,64,000
Finished goods	9,80,000

From the above information prepare a cost sheet for the year ended 31<sup>st</sup> March 2020.

(10 Marks)

**SOLUTION TEST 4 – COST SHEET & UNIT COSTING****Solution 1**

A Ltd. Co  
Cost Sheet (for the month)

Particulars	30% (30,000 units)	100% (1,00,000 units)
Works Cost @ ₹380/₹310 per unit	1,14,00,000	3,10,00,000
Administrative overheads (Fixed)	1,50,000	1,50,000
Cost of Production	1,15,50,000	3,11,50,000
Fixed marketing expenses	2,50,000	2,50,000
Variable distribution cost @ ₹30 per unit	9,00,000	30,00,000
Additional expenses:		
Gifts @ ₹30 per unit	-	30,00,000
Customers prizes	-	1,00,000
Refreshment	-	1,00,000
Sponsorship cost	-	20,00,000
Cost of Sales	1,27,00,000	3,96,00,000
Profit	38,00,000	1,04,00,000
Sales @ ₹550/₹500 per unit	1,65,00,000	5,00,00,000

At 100% capacity utilization, profit of A Ltd Company is ₹1,04,00,000 whereas at 30% profit is only ₹38,00,000. Therefore, it is advisable to the company to work at 100% capacity and incur special marketing cost.

**Solution 2**

(1) Cost Sheet

Particulars	First 3 Months	Next 9 Months	Total
Number of Units (W.N. 1)	4,500	21,600	26,100
Raw Materials @ ₹40 per unit	1,80,000	8,64,000	10,44,000
Less: Sale of Scrap of Material @ ₹5 per unit	(22,500)	(1,08,000)	(1,30,500)
Raw Materials Consumed	1,57,500	7,56,000	9,13,500
Direct Labour (W.N. 2)	1,44,000	6,48,000	7,92,000
Prime Cost	3,01,500	14,04,000	17,05,500
Factory Overheads:			
Fixed	90,000	2,70,000	3,60,000
Variable @ ₹10 per unit	45,000	2,16,000	2,61,000
Semi Variable (W.N. 3)	27,000	1,51,200	1,78,200
Works Cost	4,63,500	20,41,200	25,04,700
Administrative Overheads	1,29,600	3,88,800	5,18,400
Cost of Production	5,93,100	24,30,000	30,23,100
Selling and Distribution OH @ ₹8 per unit	36,000	1,72,800	2,08,800
Cost of Sales	6,29,100	26,02,800	32,31,900

(2) Statement Showing Selling Price Per Unit

Particulars	Amount
Sales Value for First Three Months (4,500 × 145)	6,52,500
Less: Cost of Sales for First Three Months	(6,29,100)
Profit for First Three Months	23,400
Required Profit from Next Nine Months (8,76,600 – 23,400)	8,53,200
Cost of Sales for Next Nine Months	26,02,800
Sales Value for Next Nine months	34,56,000
÷ Number of Units for Next Nine Months	÷ 21,600
Selling Price Per Unit for Next Nine Months	₹160.00

## Working Notes:

1. Calculation of production per annum:

50% for 3 months (36,000 units × 50% × 3/12)	=	4,500 units
80% for 9 months (36,000 units × 80% × 9/12)	=	21,600 units
Total production for the year	=	26,100 units

2. Calculation of Labour cost:

First Three Months (4,500 × 30 or 48,000 × 3) whichever is higher	=	1,44,000
Next Nine Months (21,600 × 30 or 48,000 × 9) whichever is higher	=	6,48,000

3. Calculation of Semi-variable cost:

First Three Months (1,08,000 × 3/12)	=	27,000
Next Nine Months [(1,08,000 + 46,800 + 46,800) × 9/12]	=	1,51,200

Note: Administrative overheads is assumed to be related to production (student may take different assumption).

**Solution 3**

## Cost Sheet for the month of September 2019

Particulars	Total Cost	Cost Per Unit
Direct materials consumed:		
Leather sheets	3,20,000	320.00
Cotton cloths	15,000	15.00
Add: Freight paid on purchase	8,500	8.50
Direct wages (₹80 × 2,000 hours)	1,60,000	160.00
Direct expenses (₹10 × 2,000 hours)	20,000	20.00
Prime Cost	5,23,500	523.50
Factory overheads:		
Depreciation on machines {(₹22,00,000 × 90%) ÷ 120 months}	16,500	16.50
Apportion cost of factory rent {(1,20,000 ÷ 2,400) × 1,960}	98,000	98.00
Works Cost	6,38,000	638.00
Less: Realisable value of cuttings (₹150 × 35 kg.)	(5,250)	(5.25)
Cost of Production	6,32,750	632.75
Less: Closing stock of bags (100 bags × ₹632.75)	(63,275)	-
Cost of Goods Sold	5,69,475	632.75
Administrative Overheads:		
Staff salary	45,000	50.00
Apportioned rent {(1,20,000 ÷ 2,400) × 240}	12,000	13.33
Selling and Distribution Overheads:		
Staff salary	72,000	80.00
Apportioned rent {(1,20,000 ÷ 2,400) × 200}	10,000	11.11
Freight paid on delivery of bags	18,000	20.00
Cost of Sales	7,26,475	807.19

## Working Note:

- |               |   |   |
|---------------|---|---|
| Factory space | = | Total space – space occupied by Administrative and Sales office |
|               | = | 2,400 - 240 - 200 = 1,960 sq. feet                              |
- |                |   |  |
|----------------|---|--|
| Units Produced | = | Main input raw material used ÷ Main material consumption for 1 unit output |
|                | = | 2,000 meter leather ÷ 2 meter = 1,000 bags                                 |
- |            |   |                                |
|------------|---|--------------------------------|
| Units sold | = | Units produced – Closing units |
|            | = | 1,000 - 100 = 900 bags         |

## Solution 4

Cost Sheet of R Ltd.  
(for the year ended at 31<sup>st</sup> March, 2020)

Particulars	Amount (₹)	Amount (₹)
Material Consumed:		
Raw materials purchased	84,00,000	
Add: Carriage inward	1,72,600	
Add: Opening stock of raw materials	6,20,000	
Less: Closing stock of raw materials	(4,60,000)	87,32,600
Direct employee (labour) cost:		
Direct wages	60,00,000	
Employer's Contribution towards PF & ESIS	7,20,000	67,20,000
Direct expenses:		
Consumable materials	4,80,000	
Cost of power & fuel	28,00,000	32,80,000
Prime Cost		1,87,32,600
Works/ Factory overheads:		
Wages to foreman and store keeper	8,40,000	
Other indirect wages to factory staffs	1,35,000	9,75,000
Gross Factory Cost		1,97,07,600
Add: Opening value of WIP		7,84,000
Less: Closing value of WIP		(6,64,000)
Factory Cost		1,98,27,600
Research & development cost paid for improvement in production process		9,60,000
Production planning office expenses		12,60,000
Cost of Production		2,20,47,600
Add: Opening stock of finished goods		14,40,000
Less: Closing stock of finished goods		(9,80,000)
Cost of Goods Sold		2,25,07,600
Administrative Overheads:		
Salary to accountants	7,20,000	
Fees to statutory auditor	1,80,000	
Fees to cost auditor	80,000	
Fee paid to independent directors	9,40,000	19,20,000
Selling and Distribution Overheads:		
Salary to delivery staffs		14,30,000
Cost of Sales		2,58,57,600
Add: Profit (b.f.)		24,02,400
Sales		2,82,60,000

Notes: Income tax and Donation to PM National Relief Fund is avoided in the cost sheet.

## TEST 5 – JOB AND BATCH COSTING

### Question 1

The following data presented by the supervisor of a factory for a job.

	₹ per unit
Direct Material	120
Direct Wages @ ₹4 per hour (Departments A - 4 hrs., B - 7 hrs., C - 2 hrs & D - 2 hrs)	60
Chargeable Expenses	20
Total	200

Analysis of the profit and loss account for the year ended 31<sup>st</sup> March, 2019:

Particulars	₹	Particulars	₹
Material	2,00,000	Sales	4,30,000
Direct Wages			
Dept. A	12,000		
Dept. B	8,000		
Dept. C	10,000		
Dept. D	20,000		
Special store items	6,000		
Overheads			
Dept. A	12,000		
Dept. B	6,000		
Dept. C	9,000		
Dept. D	17,000		
Gross profit c/d	1,30,000		
	4,30,000		4,30,000
Selling expenses	90,000	Gross profit b/d	1,30,000
Net profit	40,000		
	1,30,000		1,30,000

It is also to be noted that average hourly rates for all the four departments are similar.

Required:

- (a) Prepare a job cost sheet.
- (b) Calculate the entire revised cost using the above figures as the base.
- (c) Add 20% profit on selling price to determine the selling price.

**(5 Marks)**

### Question 2

In the current quarter, a company has undertaken two jobs. The data relating to these jobs are as under:

	Job 1102	Job 1108
Selling price	₹1,07,325	₹1,57,920
Profit as percentage on cost	8%	12%
Direct Materials	₹37,500	₹54,000
Direct Wages	₹30,000	₹42,000

It is the policy of the company to charge factory overheads as percentage on direct wages and selling and administration overheads as percentage on factory cost.

The company has received a new order for manufacturing of a similar job. The estimate of direct materials and direct wages relating to the new order is ₹64,000 and ₹50,000 respectively. A profit of 20% on sales is required.

You are required to compute:

- (i) The rates of Factory overheads and Selling and Administration overheads to be charged;  
 (ii) The Selling price of the new order.

(10 Marks)

**Question 3**

A jobbing factory has undertaken to supply 200 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is ₹ 8 per piece. From the following data present the cost and profit per piece of each batch order and overall position of the order for 1,200 pieces.

Month	Batch output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	210	650	120	240
February	200	640	140	280
March	220	680	150	280
April	180	630	140	270
May	200	700	150	300
June	220	720	160	320

The other details are:

Month	Chargeable expenses	Direct labour hours
January	12,000	4,800
February	10,560	4,400
March	12,000	5,000
April	10,580	4,600
May	13,000	5,000
June	12,000	4,800

(5 Marks)

**SOLUTION TEST 5 – JOB AND BATCH COSTING****Solution 1**

## Job Cost Sheet

Particulars		Amount
Direct Materials		120.00
Direct Wages:		
Department A	(4 hours × ₹4)	16.00
Department B	(7 hours × ₹4)	28.00
Department C	(2 hours × ₹4)	8.00
Department D	(2 hours × ₹4)	8.00
Chargeable Expenses		20.00
Prime Cost		200.00
Overheads:		
Department A @ 100% of direct wages		16.00
Department B @ 75% of direct wages		21.00
Department C @ 90% of direct wages		7.20
Department D @ 85% of direct wages		6.80
Works Cost		251.00
Selling Expenses @ 30% on works cost		75.30
Total Cost		326.30
Profit @ 20% on selling price or 25% on cost		81.575
Sales		407.875

Working note:

(1) Calculation of recovery rate of Overheads:

Recovery rate of overheads	=	(Overheads ÷ Direct Wages) × 100	
Department A	=	(12,000 ÷ 12,000) × 100	= 100% of direct wages
Department B	=	(6,000 ÷ 8,000) × 100	= 75% of direct wages
Department C	=	(9,000 ÷ 10,000) × 100	= 90% of direct wages
Department D	=	(17,000 ÷ 20,000) × 100	= 85% of direct wages

(2) Calculation of recovery rate of Selling Expenses:

Recovery rate of Selling OH	=	(Selling expenses ÷ Works Cost) × 100
	=	{90,000 ÷ (4,30,000 – 1,30,000)} × 100
	=	30% of works cost

**Solution 2**

(i) Computation of rates of factory overheads and selling and administration overheads to be charged:

Let % of factory overheads to direct wages be F and % of selling and administrative overheads to factory cost be A

## Jobs Cost Sheet

Particulars	Job 1102	Job 1108
Direct materials	37,500	54,000
Direct wages	30,000	42,000
Prime cost	67,500	96,000
Factory overheads	30,000F	42,000F
Factory cost	67,500+30,000F	96,000+42,000F
Selling and Administration overheads	(67,500+30,000F)A	(96,000+42,000F)A
Total cost	(67,500+30,000F)(1+A)	(96,000+42,000F)(1+A)

\* Computation of total cost of jobs:

$$\text{Total cost of Job 1102 when 8\% is the profit on cost} = \frac{1,07,325}{108\%} \times 100 = ₹99,375$$

$$\text{Total cost of Job 1108 when 12\% is the profit on cost} = \frac{1,57,920}{112\%} \times 100 = ₹1,41,000$$

Since the total cost of jobs 1102 and 1108 are equal to ₹99,375 and ₹1,41,000 respectively, therefore, we have the following equations:

$$\begin{aligned} (67,500 + 30,000F) (1 + A) &= ₹99,375 && (1) \\ (96,000 + 42,000F) (1 + A) &= ₹1,41,000 && (2) \end{aligned}$$

Or

$$\begin{aligned} 67,500 + 30,000F + 67,500 A + 30,000FA &= ₹99,375 \\ 96,000 + 42,000F + 96,000 A + 42,000FA &= ₹1,41,000 \end{aligned}$$

Or

$$\begin{aligned} 30,000F + 67,500A + 30,000FA &= ₹31,875 && (3) \\ 42,000F + 96,000A + 42,000FA &= ₹45,000 && (4) \end{aligned}$$

On solving (3) and (4) we get:

$$\begin{aligned} A &= 0.25 \text{ or } 25\% \text{ on factory cost} \\ F &= 0.40 \text{ or } 40\% \text{ on direct wages} \end{aligned}$$

(ii) Selling Price of the New Order:

Particulars	Amount
Materials	64,000
Productive Wages	50,000
Prime Cost	1,14,000
Factory Overheads (40% of 50,000)	20,000
Factory Cost	1,34,000
Selling and Admin Overheads (25% of 1,34,000)	33,500
Total Cost	1,67,500
Profit (20% on Sales or 25% on Cost)	41,875
Sale Price	2,09,375

**Solution 3**

Statement Showing Cost and Profit

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	210	200	220	180	200	220	1,230
Sales value (₹)	1,680	1,600	1,760	1,440	1,600	1,760	9,840
Material cost (₹)	650	640	680	630	700	720	4,020
Direct wages (₹)	120	140	150	140	150	160	860
Chargeable expenses (₹)	600	672	672	621	780	800	4,145
Total cost	1,370	1,452	1,502	1,391	1,630	1,680	9,025
Profit per batch (₹)	310	148	258	49	(30)	80	815
Total cost per unit (₹)	6.52	7.26	6.83	7.73	8.15	7.64	7.34
Profit per unit (₹)	1.48	0.74	1.17	0.27	(0.15)	0.36	0.66

Overall position of the order for 1,200 units:

Sales value of 1,200 units @ ₹8 per unit	₹9,600
Total cost of 1,200 units @ ₹7.34 per unit	₹8,808
Profit	₹792

Note: Chargeable expenses =  $\frac{\text{Chargeable expenses}}{\text{Direct labour hour for the month}} \times \text{Direct labour hours for batch}$

## TEST 6 – ACTIVITY BASED COSTING

### Question 1

G-2020 Ltd. is a manufacturer of a range of goods. The cost structure of its different products is as follows:

Particulars	A	B	C
Direct Material per unit	50	40	40
Direct Labour per unit (₹10 per hour)	30	40	50
Production Overheads	30	40	50
Total Cost per unit	110	120	140
Quantity Produced (in units)	10,000	20,000	30,000

G-2020 Ltd. was absorbing overheads on the basis of direct labour hours. A newly appointed management accountant has suggested that the company should introduce ABC system and has identified cost drivers and cost pools as follows:

Activity Cost Pool	Cost Driver	Associated Cost
Stores Receiving	Purchase Requisitions	₹2,96,000
Inspection	Number of Production Runs	₹8,94,000
Dispatch	Orders Executed	₹2,10,000
Machine Setup	Number of Setups	₹12,00,000

The following information is also supplied:

Particulars	A	B	C
No. of Setups	360	390	450
No. of Orders Executed	180	270	300
No. of Production Runs	750	1,050	1,200
No. of Purchase Requisitions	300	450	500

You are required to calculate activity based production cost of all the three products.

**(10 Marks)**

### Question 2

Family Store 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 2019-20 for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹39,67,500	₹1,05,03,000	₹60,49,500
Cost of goods sold	₹30,00,000	₹75,00,000	₹45,00,000
Cost of bottles returned	₹60,000	₹0	₹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 store also provides the following information for the year 2019-20:

Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	₹60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	₹7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	₹12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and ongoing restocking	₹8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	₹15,36,000	15,36,000 items sold

Required:

1. Family store 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 and operating income as a % of revenues for each product line.
2. If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using an activity-based costing system, Calculate the operating income and operating income as a % of revenues for each product line.

**(10 Marks)**

**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 (Units)	4,000		3,000		2,000	
Resources per Unit:	Qty	Rate	Qty	Rate	Qty	Rate
Essential Oils	60 ml	₹200/100 ml	55 ml	₹300/100 ml	65 ml	₹300/100 ml
Cocoa Butter	20 g	₹200/100 g	20 g	₹200/100 g	20 g	₹200/100 g
Filtered Water	30 ml	₹15/100 ml	30 ml	₹15/100 ml	30 ml	₹15/100 ml
Chemicals	10 g	₹30/100 g	12 g	₹50/100 g	15 g	₹60/100 g
Direct Labour	30 minutes	₹10/hour	40 minutes	₹10/hour	60 minutes	₹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 ₹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	(₹)	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:

1. Prepare a statement showing the unit costs and total costs of each product using the absorption costing method.
2. Prepare a statement showing the product costs of each product using the ABC approach.
3. State what are the reasons for the different product costs under the two approaches?

**(10 Marks)**

## SOLUTION TEST 6 – ACTIVITY BASED COSTING

### Solution 1

Statement Showing Production Cost Using ABC Method

Particulars	A (₹)	B (₹)	C (₹)
Number of units	10,000	20,000	30,000
Direct Material @ ₹50/40/40 per unit	5,00,000	8,00,000	12,00,000
Direct Labour @ ₹30/40/50 per unit	3,00,000	8,00,000	15,00,000
<b>Production Overhead:</b>			
Stores receiving @ ₹236.8 per requisition	71,040 (236.8 × 300)	1,06,560 (236.8 × 450)	1,18,400 (236.8 × 500)
Inspection @ ₹298 per production run	2,23,500 (298 × 750)	3,12,900 (298 × 1,050)	3,57,600 (298 × 1,200)
Dispatch @ ₹280 per order	50,400 (280 × 180)	75,600 (280 × 270)	84,000 (280 × 300)
Machine setup @ ₹100 per setup	3,60,000 (100 × 360)	3,90,000 (100 × 390)	4,50,000 (100 × 450)
<b>Total Production Cost</b>	<b>15,04,940</b>	<b>24,85,060</b>	<b>37,10,000</b>
<b>Production Cost Per Unit</b>	<b>150.49</b>	<b>124.25</b>	<b>123.67</b>

Calculation of Activity rate:

Activity Cost Pool	Amount	Cost Driver	Volume	Cost Driver Rate
Stores Receiving	₹2,96,000	Purchase requisitions	1,250	₹236.80 per requisition
Inspection	₹8,94,000	Number of production runs	3,000	₹298 per production run
Dispatch	₹2,10,000	Orders executed	750	₹280 per order
Machine Setup	₹12,00,000	Number of setups	1,200	₹100 per setup

### Solution 2

1. Statement of Operating income and Operating income as a % of revenues for each product line  
(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS)	9,00,000	22,50,000	13,50,000	45,00,000
<b>Total cost</b>	<b>39,00,000</b>	<b>97,50,000</b>	<b>58,50,000</b>	<b>1,95,00,000</b>
<b>Operating income (Sales – Total cost)</b>	<b>67,500</b>	<b>7,53,000</b>	<b>1,99,500</b>	<b>10,20,000</b>
<b>% of Operating income to Sales</b>	<b>1.70%</b>	<b>7.17%</b>	<b>3.30%</b>	<b>4.97%</b>

Working notes:

(a) Calculation of Cost Driver Rate

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	7,80,000	1,560 purchase orders	₹500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹400 per delivery
Shelf-stocking	8,64,000	8,640 hours	₹100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹1 per item sold

(b) Total support cost = 60,000 + 7,80,000 + 12,60,000 + 8,64,000 + 15,36,000  
= 45,00,000

(c) Percentage of support cost to COGS = (45,00,000 ÷ 1,50,00,000) × 100 = 30%

2. Statement of Operating income and Operating income as a % of revenues for each product line  
(When support costs are allocated to product lines using an activity based costing system)

	Soft Drinks (₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost of Goods sold (COGS)	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	-	-	60,000
Ordering cost (360 : 840 : 360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost (300 : 2190 : 660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost (540 : 5400 : 2700)	54,000	5,40,000	2,70,000	8,64,000
Customer Support cost (1,26,000 : 11,04,000 : 3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost	35,54,000	1,04,40,000	55,20,000	1,95,00,000
Operating income (Sales – Total cost)	4,27,500	63,000	5,29,500	10,20,000
% of Operating income to Sales	10.78%	0.60%	8.75%	4.97%

**Solution 3**

## 1. Statement Showing “Unit Cost and Total Cost as per Absorption Costing”

Particulars	BABYSOFT- Gold	BABYSOFT- Pearl	BABYSOFT- Diamond
Number of units	4,000	3,000	2,000
Direct Materials	167.50	215.50	248.50
Direct Labour [(30, 40, 60 minutes) @ ₹10 per hour	5.00	6.67	10.00
Production OH [(30, 40, 60 minutes) @ ₹33 per hour	16.50	22.00	33.00
Cost per unit	189.00	244.17	291.50
Total cost (Cost per unit × number of units)	7,56,000	7,32,510	5,83,000

Working notes:

(a) Total Direct labour hours = 4,000 units × 30/60 + 3,000 × 40/60 + 2,000 × 1 hour  
= 2,000 hours + 2,000 hours + 2,000 hours  
= 6,000 hours

(b) Overhead rate = Budgeted overheads ÷ Budgeted labour hours  
= ₹1,98,000 ÷ 6,000 hours = ₹33/direct labour hour

## (c) Calculation of Direct material cost

	BABYSOFT- Gold (₹)	BABYSOFT- Pearl (₹)	BABYSOFT- Diamond (₹)
Essential oils	120.00 (200 × 60/100)	165.00 (300 × 55/100)	195.00 (300 × 65/100)
Cocoa Butter	40.00 (200 × 20/100)	40.00 (200 × 20/100)	40.00 (200 × 20/100)
Filtered water	4.50 (30 × 15/100)	4.50 (30 × 15/100)	4.50 (30 × 15/100)
Chemicals	3.00 (30 × 10/100)	6.00 (50 × 12/100)	9.00 (60 × 15/100)
Total cost	167.50	215.50	248.50

## 2. Statement Showing “Unit Cost and Total Cost as per ABC Costing”

Particulars	BABYSOFT- Gold	BABYSOFT- Pearl	BABYSOFT- Diamond
Number of units	4,000	3,000	2,000
Direct Materials	167.50	215.50	248.50
Direct Labour	5.00	6.67	10.00

Production OH:			
Forklifting cost	6.48 (0.06 × 108)	6.36 (0.06 × 106)	7.02 (0.06 × 117)
Supervising cost	5.00 (10 × 30/60)	6.67 (10 × 40/60)	10.00 (10 × 60/60)
Utilities	8.50 (1.70 × 5)	8.50 (1.70 × 5)	10.20 (1.70 × 6)
Cost per unit	192.48	243.70	285.72
Total cost	7,69,920	7,31,100	5,71,440

Working notes:

- (a) Forklifting rate = ₹58,000 ÷ 9,84,000 grams = ₹0.06 per gram
- (b) Supervising rate = ₹60,000 ÷ 6,000 hours labour hour = ₹10 labour hour
- (c) Utilities rate = ₹80,000 ÷ 47,000 machine operations = ₹1.70 per machine operations

(d) Calculation of Total Weight and Total Operations:

	BABYSOFT- Gold	BABYSOFT- Pearl	BABYSOFT- Diamond	Total
Quantity (units)	4,000	3,000	2,000	-
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 (4,000 × 108)	3,18,000 (3,000 × 106)	2,34,000 (2,000 × 117)	9,84,000
Total operations	20,000 (4,000 × 5)	15,000 (3,000 × 5)	12,000 (2,000 × 6)	47,000

3. 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.

**TEST 7 – DIRECT EXPENSES****Question 1**

Aditya Ltd. is an engineering manufacturing company producing job order on the basis of specification given by the customers. During the last the month it has completed three job works namely A, B and C. The following are the items of expenditures which are incurred apart from direct materials and direct employee cost:

- (a) Office and administration cost: ₹3,00,000
- (b) Product blueprint cost for job A: ₹1,40,000
- (c) Hire charges paid for machinery used in job work B: ₹40,000
- (d) Salary to office attendants: ₹50,000
- (e) One time license fee paid for software used to make computerized graphics for job C: ₹50,000
- (f) Salary paid to marketing manager: ₹1,20,000

Calculate direct expenses attributable to each Job.

**(5 Marks)**

**Question 2**

The following expenditures were incurred in Aditya Ltd. For the month of March 2024:

Particulars	₹
Paid for power & fuel	4,80,200
Wages paid to factory workers	8,44,000
Bill paid to job workers	9,66,000
Royalty paid for production	8,400
Fee paid to technician hired for the job	96,000
Administrative overheads	76,000
Commission paid to sales staffs	1,26,000

You are required to calculate direct expenses for the month.

**(5 Marks)**

**SOLUTION TEST 7 – DIRECT EXPENSES****Solution 1**

## Calculation of Direct Expenses

Particulars	Job A (₹)	Job B (₹)	Job C (₹)
Product blueprint cost	1,40,000	-	-
Hire charges paid for machinery	-	40,000	-
License fee paid for software	-	-	50,000
Total Direct Expenses	1,40,000	40,000	50,000

**Solution 2**

## Calculation of Direct Expenses

Particulars	₹
Paid for power & fuel	4,80,200
Bill paid to job workers	9,66,000
Royalty paid for production	8,400
Fee paid to technician hired for the job	96,000
Total	15,50,600

Notes:

- (a) Wages paid to factory workers is direct employee cost.
- (b) Administrative overhead is indirect expense.
- (c) Commission paid to sales staffs comes under selling expenses.

**TEST 8 – OPERATING COSTING OR SERVICE COSTING****Question 1**

ABC Transport Company has been given a route 40 km long to run a bus. The bus costs the company a sum of ₹10,00,000. It has been insured at 3% p.a. and the annual tax will amount to ₹20,000. Garage rent is ₹2,000 p.m. Annual repairs will be ₹20,000 and the bus is likely to last for 5 years. The driver's salary will be ₹3,000 p.m. and the conductor's salary will be ₹2,000 p.m. in addition to 10% of takings as commission (to be shared by the driver and the conductor equally). Cost of stationery will be ₹1,000 p.m. Manager cum Accountant's salary is ₹7,000 p.m. Petrol and oil will be ₹500 per 100 km. The bus will make 3 up and down trips carrying on an average 40 passengers on each trip.

Assuming 15% profit on takings, calculate the buy fare to be charged from each passenger for one side journey. The bus will run on an average 25 days in a month.

**(10 Marks)****Question 2**

A lodging home is being run in a small hill station with 100 single rooms. The home offers concessional rates during six off-season months in a year. During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending on 31st March 2017. [Assume a month to be of 30 days].

- (a) Occupancy during the season is 80% while in the off- season it is 40% only.
- (b) Total investment in the home is ₹200 lakhs of which 80% relate to buildings and balance for furniture and equipment.
- (c) Expenses:
- |  |           |
|--|-----------|
| Staff salary [Excluding room attendants] | ₹5,50,000 |
| Repairs to building                      | ₹2,61,000 |
| Laundry charges                          | ₹80,000   |
| Interior                                 | ₹1,75,000 |
| Miscellaneous expenses                   | ₹1,90,800 |
- (d) Annual depreciation is to be provided for buildings @ 5% and on furniture and equipment @ 15% on straight-line basis.
- (e) Room attendants are paid ₹10 per room day on the basis of occupancy of the rooms in a month.
- (f) Monthly lighting charges are ₹120 per room, except in four months in winter when it is ₹30 per room and this cost is on the basis of full occupancy for a month.

You are required to work out the room rent chargeable per day both during the season and the off-season months on the basis of the foregoing information.

**(10 Marks)**

**SOLUTION TEST 8 – OPERATING COSTING OR SERVICE COSTING****Solution 1**

## Operating Cost Sheet

Particulars		Amount
<b>(A) Standing Charges:</b>		
Depreciation per month	$(10,00,000 \div 5 \text{ Years} \times \frac{1}{12})$	16,667
Insurance per month	$[(10,00,000 \times 3\%) \times \frac{1}{12}]$	2,500
Annual Tax for one month	$(20,000 \times \frac{1}{12})$	1,666
Garage Rent		2,000
Manager-cum accountant's salary		7,000
Driver's salary		3,000
Conductor's salary		2,000
Total (A)		34,833
<b>(B) Running Charges:</b>		
Stationery		1,000
Petrol and oil	$(\frac{500}{100} \times 6,000 \text{ kms})$	30,000
Commission @ 10% of collections 'WN'		9,000
Total (B)		40,000
<b>(C) Maintenance Charges:</b>		
Repairs and maintenance	$(20,000 \times \frac{1}{12})$	1,667
Total (C)		1,667
Total operating cost (A + B + C)		76,500
Add: Profit @ 15% of collections		13,500
Collections (WN 3)		90,000
÷ Total Passenger-kms		÷ 2,40,000
Fare for per passenger-km		₹0.375
Fare for per passenger-single side $(0.375 \times 40)$		₹15.00

## Working Notes:

- 1: Total travelling of bus in one month =  $2 \times \text{No of round trips daily} \times \text{Distance one way} \times \text{No of days}$   
=  $2 \times 3 \times 40 \times 25$   
= 6,000 kms
- 2: Passenger-kms per month =  $\text{No of kms travelled per month} \times \text{No of passengers}$   
=  $6,000 \times 40$   
= 2,40,000 passenger-kms
- 3: Total collections =  $\text{Operating cost (excluding commission on collections)} + 10\% \text{ for commission} + 15\% \text{ for profit}$   
=  $67,500 + 25\% \text{ of collections}$   
= ₹90,000

**Solution 2**

## Statement Showing Per Day Chargeable Rent

Particulars	₹
Staff salary	5,50,000
Repairs to building	2,61,000
Laundry charges	80,000
Interior	1,75,000
Miscellaneous expenses	1,90,800
Depreciation:	
On Building $(₹200 \text{ lakhs} \times 80\% \times 5\%)$	8,00,000
On Furniture $(₹200 \text{ lakhs} \times 20\% \times 15\%)$	6,00,000

Room attendant's wages:	
In Season (100 rooms × 80% × 30 days × 6 months × ₹10)	1,44,000
In Off-Season (100 rooms × 40% × 30 days × 6 months × ₹10)	72,000
Lighting charges:	
Season & Non Winter (100 rooms × 80% × 6 months × ₹120)	57,600
Off-Season & Non Winter (100 rooms × 40% × 2 months × ₹120)	9,600
Off-Season & Winter (100 rooms × 40% × 4 months × ₹30)	4,800
	29,44,800
Total Cost	29,44,800
Add: Profit @ 20% on Room rent or 25% on Cost	7,36,200
Total Rent to be Charged	36,81,000
÷ Equivalent Off-Season room days	÷ 36,000
Rent for one room per day in Off-Season	₹102.25
Rent for one room per day in Season (₹102.25 × 2)	₹204.50

## Working Notes:

$$\begin{aligned}
 \text{Equivalent Off-Season room days} &= 100 \times 80\% \times 30 \text{ days} \times 6 \text{ months} \times 2 \text{ (double of Off-Season)} + \\
 & 100 \times 40\% \times 30 \text{ days} \times 6 \text{ months} \times 1 \\
 &= 14,400 \times 2 + 7,200 \times 1 = 36,000 \text{ Room days}
 \end{aligned}$$

## TEST 9 – PROCESS & OPERATION COSTING

### Question 1

From the following information for the month of October 2003, prepare Process III Account:

Opening WIP in Process III	:	1,800 units at ₹27,000
Transfer from Process II	:	47,700 units at ₹5,36,625
Transferred to Warehouse	:	43,200 units
Closing WIP of Process III	:	4,500 units
Units scrapped	:	1,800 units
Direct material added in Process III	:	₹1,77,840
Direct Wages	:	₹87,840
Production overheads	:	₹43,920

Degree of completion:

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

The normal loss in the process was 5% of the production and scrap was sold @ ₹6.75 per unit.

**(10 Marks)**

### Question 2

Pharma Limited produces product 'Glucodin' which passes through two processes before it is completed and transferred to finished stock. The following data relates to March, 2010:

Details	Process I	Process II	Finished Stock
Opening Stock	1,50,000	1,80,000	4,50,000
Direct materials	3,00,000	3,15,000	-
Direct Wages	2,24,000	2,25,000	-
Factory overheads	2,10,000	90,000	-
Closing Stock	74,000	90,000	2,25,000
Inter process profit included in Opening stock	NIL	30,000	1,65,000

Output of process I is transferred to Process II at 25 percent profit on the transfer price, whereas output of process II is transferred to finished stock at 20 percent on transfer price. Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales for the month is ₹28,00,000.

You are required to prepare Process I A/c, Process II A/c, and Finished Stock A/c showing the profit element at each stage.

**(10 Marks)**

### Question 3

A company manufacturing chemical solution that passes through a number of processes uses FIFO method to value WIP and Finished goods. At the end of the month of September, a fire occurred in the factory and some papers containing records of the process operations for the month were destroyed. The company desires to prepare process account for the month during which the fire occurred. Some information could be gathered as to operating activities as under:

- Opening work-in process at the beginning of the month of 1,100 litres, 40% complete for labour and 60% for overheads. Opening WIP was valued at ₹48,260.
- Closing WIP at the end of the month was 220 litres, 40% complete for labour and 30% for overheads.
- Normal loss is 10% of input and total losses during the month were 2,200 litres partly due to fire damage. Assume degree of completion of abnormal loss is 100%.
- Output sent to Finished goods warehouse was 5,900 litres.

- Losses have a scrap value of ₹20 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹53 for the month consisting:

Raw materials	₹35
Labour	₹8
Overheads	₹10
Total	₹53

You are required to:

- (1) The quantity (in litres) of raw materials input during the month.
- (2) Calculate the quantity (in litres) of normal loss and abnormal loss/gain experienced in the month.
- (3) Calculate the value of raw materials, labour and overheads added to the process during the month.
- (4) Prepare process account for the month.

**(10 Marks)**

#### Question 4

'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 process (4,500 litre)	
Sugar cane	₹50,000
Labour	₹15,000
Overheads	₹45,000
Sugarcane introduced for juice extraction (1,00,000 kg)	₹5,00,000
Direct Labour	₹2,00,000
Overheads	₹6,00,000
Abnormal Loss	1,000 kg
Degree of completion:	
Sugar cane	100%
Labour and overheads	80%
Closing work-in process	9,000 litre
Degree of completion:	
Sugar cane	100%
Labour and overheads	80%
Extracted juice transferred for filtering and boiling (Consider mass of 1 litre of juice equivalent to 1 kg)	39,500 litre

You are required to prepare using average method:

1. Statement of equivalent production,
2. Statement of cost,
3. Statement of distribution cost, and
4. Process I Account.

**(10 Marks)**

**SOLUTION TEST 9 – PROCESS & OPERATION COSTING****Solution 1**

Statement of Equivalent Production (FIFO Method)

Particulars	Units	Materials A		Materials B		Labour & OH	
		%	Eq. Unit	%	Eq. Unit	%	Eq. Unit
Opening units:							
Used for Completed Units	1,800	-	-	20	360	40	720
Units Introduced:							
Used for Completed Units	41,400	100	41,400	100	41,400	100	41,400
Used for Closing WIP	4,500	100	4,500	70	3,150	50	2,250
Normal Loss	2,250	-	-	-	-	-	-
Less: Abnormal Gain	(450)	100	(450)	100	(450)	100	(450)
<b>Total</b>	<b>49,500</b>	<b>-</b>	<b>45,450</b>	<b>-</b>	<b>44,460</b>	<b>-</b>	<b>43,920</b>

Statement of Cost

Elements	Cost	Equivalent Units	Cost Per Unit
Materials A	5,36,625 – 15,187 = 5,21,438	45,450	11.4728
Materials B	1,77,840	44,460	4.00
Labour	87,840	43,920	2.00
Overheads	43,920	43,920	1.00
			<b>18.4728</b>

Statement of Evaluation

Particulars	Elements	Eq. Units	Cost Per Unit	Total
Units Transferred:				
Current Period Cost	Materials A	41,400	11.4728	4,74,973
	Materials B	41,760	4.00	1,67,040
	Labour, Overhead	42,120	2.00 + 1.00	1,26,360
Add: Cost of Opening WIP (Used in completed units)				27,000
				<b>7,95,373</b>
Closing WIP	Materials A	4,500	11.4728	51,628
	Materials B	3,150	4.00	12,600
	Labour, Overhead	2,250	2.00 + 1.00	6,750
				<b>70,978</b>
Abnormal Gain	All	450	18.4728	<b>8,313</b>

Process III Account

Particulars	Units	₹	Particulars	Units	₹
To Opening WIP	1,800	27,000	By Normal Loss	2,250	15,187
To Process II Account	47,700	5,36,625	(5% of 45,000 units)		
To Direct Materials		1,77,840	By Process IV A/c	43,200	7,95,373
To Direct Labour		87,840	By closing WIP	4,500	70,978
To Production Overhead		43,920			
To Abnormal Gain	450	8,313			
	<b>49,950</b>	<b>8,81,538</b>		<b>49,950</b>	<b>8,81,538</b>

## Working note

$$\begin{aligned} \text{Production units} &= \text{Opening units} + \text{Units transferred from process II} - \text{Closing units} \\ &= 1,800 \text{ units} + 47,700 \text{ units} - 4,500 \text{ units} = 45,000 \text{ units} \end{aligned}$$

**Solution 2**

## Process I A/c

Particulars	Total	Cost	Profit	Particulars	Total	Cost	Profit
To Balance b/d	1,50,000	1,50,000	-	By Process II A/c	10,80,000	8,10,000	2,70,000
To Materials	3,00,000	3,00,000	-				
To Wages	2,24,000	2,24,000	-				
Prime Cost	6,74,000	6,74,000	-				
- Closing Stock	(74,000)	(74,000)	-				
	6,00,000	6,00,000	-				
To Factory OH	2,10,000	2,10,000	-				
Total Cost	8,10,000	8,10,000	-				
To Profit	2,70,000	-	2,70,000				
	10,80,000	8,10,000	2,70,000				

## Process II A/c

Particulars	Total	Cost	Profit	Particulars	Total	Cost	Profit
To Balance b/d	1,80,000	1,50,000	30,000	By Finished Stock A/c	22,50,000	15,15,000	7,35,000
To Process I A/c	10,80,000	8,10,000	2,70,000				
To Materials	3,15,000	3,15,000	-				
To Wages	2,25,000	2,25,000	-				
Prime Cost	18,00,000	15,00,000	3,00,000				
- Closing Stock	(90,000)	(75,000)	*(15,000)				
	17,10,000	14,25,000	2,85,000				
To Factory OH	90,000	90,000	-				
Total Cost	18,00,000	15,15,000	2,85,000				
To Profit	4,50,000	-	4,50,000				
	22,50,000	15,15,000	7,35,000		22,50,000	15,15,000	7,35,000

$$\text{Profit element in closing stock} = \frac{3,00,000}{18,00,000} \times 90,000 = 15,000$$

## Finished Stock A/c

Particulars	Total	Cost	Profit	Particulars	Total	Cost	Profit
To Balance b/d	4,50,000	2,85,000	1,65,000	By Sales A/c or Costing p & L A/c	28,00,000	16,48,500	11,51,500
To Process II	22,50,000	15,15,000	7,35,000				
- Closing Stock	(2,25,000)	(1,51,500)	*(73,500)				
COGS	24,75,000	16,48,500	8,26,500				
To Profit	3,25,000	-	3,25,000				
	28,00,000	16,48,500	11,51,500				

$$\text{Profit element in closing stock} = \frac{7,35,000}{22,50,000} \times 2,25,000 = 73,500$$

**Solution 3**

(1) Calculation of quantity of raw materials input during the month:

$$\begin{aligned} \text{Raw materials input} &= \text{Output of Finished goods} + \text{Closing WIP} + \text{Losses} - \text{Opening WIP} \\ &= 5,900 + 220 + 2,200 - 1,100 = 7,220 \text{ litres} \end{aligned}$$

(2) Calculation of quantity of normal loss and abnormal loss or gain:

$$\begin{aligned} \text{Normal loss} &= 10\% \text{ of Input} \\ &= 10\% \text{ of } 7,220 = 722 \text{ litres} \end{aligned}$$

$$\begin{aligned} \text{Abnormal loss} &= \text{Actual loss} - \text{Normal loss} \\ &= 2,200 - 722 = 1,478 \text{ litres} \end{aligned}$$

## (3) Statement of Material, Labour and Overheads added during the month

Particulars	Materials	Labour	Overheads
Cost per equivalent units	35	8	10
Number of equivalent units	6,498	7,026	6,784
Cost of equivalent units	2,27,430	56,208	67,840
Add: Scrap value of normal loss units (722 × 20)	14,440	-	-
<b>Total value added</b>	<b>2,41,870</b>	<b>56,208</b>	<b>67,840</b>

## (4) Process A/c

Particulars	Units	₹	Particulars	Units	₹
To Opening WIP	1,100	48,260	By Normal Loss	722	14,440
To Materials	7,220	2,41,870	By Finished Output	5,900	3,12,340
To Labour		56,208	(4,800 × 35 + 5,460 × 8 + 5,240 × 10 + 48,260)		
To Overheads		67,840	By Abnormal Loss	1,478	78,334
			(1,478 × 53)		
			By WIP Closing	220	9,064
			(220 × 35 + 88 × 8 + 66 × 10)		
	<b>8,320</b>	<b>4,14,178</b>		<b>8,320</b>	<b>4,14,178</b>

Working Note:

## Statement of Equivalent Production

Particulars	Units	Materials		Labour		Overheads	
		%	E. Units	%	E. Units	%	E. Units
Opening Units:							
Used for Completed Units	1,100	-	-	60	660	40	440
Current Units:							
Used for Completed Units	4,800	100	4,800	100	4,800	100	4,800
Normal loss	722	-	-	-	-	-	-
Abnormal loss	1,478	100	1,478	100	1,478	100	1,478
Closing WIP	220	100	220	40	88	30	66
<b>Total</b>	<b>8,320</b>	<b>-</b>	<b>6,498</b>	<b>-</b>	<b>7,026</b>	<b>-</b>	<b>6,784</b>

**Solution 4**

## 1. Statement of Equivalent Production (Average Cost Method)

Particulars	Total Units	Materials		Labour & OH	
		%	Unit	%	Unit
Units Completed	39,500	100	39,500	100	39,500
Normal loss	55,000	-	-	-	-
Abnormal Loss	1,000	100	1,000	80	800
Closing WIP	9,000	100	9,000	80	7,200
<b>Total</b>	<b>1,04,500</b>	<b>-</b>	<b>49,500</b>	<b>-</b>	<b>47,500</b>

## 2. Statement of Cost

Elements	Total Cost	Equivalent Units	Cost Per Unit
Materials	50,000 + 5,00,000 = 5,50,000	49,500	11.111
Labour	15,000 + 2,00,000 = 2,15,000	47,500	4.526
Overheads	45,000 + 6,00,000 = 6,45,000	47,500	13.579
			<b>29.216</b>

## 3. Statement of Distribution of Cost

Particulars	Elements	Eq. Units	Cost Per Unit	Total
Units Completed	All	39,500	29.216	11,54,032

Abnormal Loss	Materials Labour, Overheads	1,000 800	11.111 4.526 + 13.579	11,111
				14,484
				25,595 + 18
Closing WIP	Materials Labour, Overheads	9,000 7,200	11.111 4.526 + 13.579	99,999
				1,30,356
				2,30,355

## 4. Process I Account

Particulars	Units	₹	Particulars	Units	₹
To Opening WIP	4,500	1,10,000	By Normal Loss @55% of 1,00,000 kgs.	55,000	-
To Sugarcane introduced	1,00,000	5,00,000	By Process II A/c	39,500	11,54,032
To Direct Labour		2,00,000	By Abnormal Loss A/c	1,000	25,613
To Overhead		6,00,000	By Closing WIP	9,000	2,30,355
	1,04,500	14,10,000		1,04,500	14,10,000

## TEST 10 – JOINT PRODUCTS & BY PRODUCTS

### Question 1

A Company produces two joint products P and Q in 70 : 30 ratio from basic raw materials in department A. The input output ratio of department A is 100 : 85. Product P can be sold at the split of stage or can be processed further at department B and sold as product AR. The input output ratio is 100 : 90 of department B. The department B is created to process product P only and to make it product AR.

The selling prices per kg are as under:

Product P	₹85
Product Q	₹290
Product AR	₹115

The production will be taken up in the next month.

Raw materials	8,00,000 Kgs
Purchase price	₹80 per Kg

	Department A (In Lakh)	Department B (In Lakh)
Direct materials	35.00	5.00
Direct labour	30.00	9.00
Variable overheads	45.00	18.00
Fixed overheads	40.00	32.00
Total	150.00	64.00

Selling Expenses:

Product P	₹24.60 lakh
Product Q	₹21.60 lakh
Product AR	₹16.80 lakh

Required

- (i) Prepare a statement showing the apportionment of joint costs.
- (ii) State whether it is advisable to produce product AR or not.

**(10 Marks)**

### Question 2

A company manufactures one main product (M1) and two by-products B1 and B2 for the month of January 2013, following details are available:

Total Cost upto Separation Point ₹2,12,400

Particulars	M1	B1	B2
Cost after separation	-	₹35,000	₹24,000
No. of units produced	4,000	1,800	3,000
Selling price per units	₹100	₹40	₹30
Estimated net profit as percentage to sales value	-	20%	30%
Estimated selling expenses as percentage to sales value	20%	15%	15%

There are no beginning or closing inventories.

Prepare statement showing:

- I. Allocation of joint cost; and
- II. Product-wise and overall profitability of the company for January 2013.

**(10 Marks)**

**Question 3**

'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 @ ₹100 per 1000 ml. Conversion cost of ₹1,00,000 were incurred upto 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 (₹)
Buttermilk	28	28	30
Butter	20	-	-
Ghee	16	16	480

All 20 tonne of butter were further processed at an incremental cost of ₹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:

- Show how joint cost would be apportioned between Buttermilk and Butter under Estimated Net Realisable Value method.
- 'Healthy Bones' offers to purchase 20 tonne of butter in February at ₹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?

**(5 Marks)**

**SOLUTION TEST 10 – JOINT PRODUCTS & BY PRODUCTS****Solution 1**

## (i) Statement Showing Apportionment of Joint Cost

Particulars	Product AR (₹ in Lakh)	Product Q (₹ in Lakh)
Sales value at split-off-point (P and Q)	(4,76,000 × 85)	(2,04,000 × 290)
	404.60	591.60
Less: Selling expenses if sold at split-off-point	(24.60)	(21.60)
Net sales at split-off-point	380.00	570.00
Share of joint cost of ₹790 lakh (in 380 : 570)	316.00	474.00

## (ii) Statement Showing Further Processing Decision

Incremental Revenue (₹ in Lakh)	Incremental Cost (₹ in Lakh)	Situation	Decision
492.66 – 404.60 = 88.06	64 + 16.80 – 24.60 = 56.20	IR > IC	Yes

## Working Notes:

- Input in Department A = 8,00,000 kgs

Yield = 85%

Therefore Output = 85% of 8,00,000 kgs = 6,80,000 kgs

Ratio of output for P and Q = 70 : 30

Product of P = 70% of 6,80,000 kgs = 4,76,000 kgs

Product of Q = 30% of 6,80,000 kgs = 2,04,000 kgs
- Calculation of joint cost:

Raw materials (8,00,000 kgs × ₹80) = 640 lakh

Process cost of department A = 150 lakh

Joint cost = 790 lakh
- Calculation of output and sales value of product AR:

Output = 90% of 4,76,000 kgs = 4,28,400 kgs

Sales = 4,28,400 kgs. × ₹115 = 492.66 Lakhs

**Solution 2**

## I. Statement of Allocation of Joint Cost

Particulars	B1	B2
Sales @ ₹40/₹30 per unit	72,000	90,000
Less: Estimated profit @ 20%/30%	14,400	27,000
Less: Estimated selling expenses @ 15% on sales	10,800	13,500
Less: Further estimated cost (cost after separation)	35,000	24,000
Joint Cost	11,800	25,500
Total Joint Cost		2,12,400
Less: Joint cost allocable to B1		11,800
Less: Joint cost allocable to B2		25,500
Joint Cost allocable to M1		1,75,100

## II. Product-wise &amp; Overall Profitability Statement

Particulars	M1	B1	B2	Total
Sales	4,00,000	72,000	90,000	5,62,000
Less: Selling expenses @ 20%/15%/15%	80,000	10,800	13,500	1,04,300
Less: Cost after separation	Nil	35,000	24,000	59,000
Less: Joint cost	1,75,100	11,800	25,500	2,12,400
Profit	1,44,900	14,400	27,000	1,86,300

**Solution 3**(a) Statement Showing Apportionment of Joint Cost  
(Estimated Net Realisable Value Method)

Particulars	Buttermilk Amount (₹)	Butter Amount (₹)
Sales Value	8,40,000 (₹30 × 28 × 1000)	76,80,000 (₹480 × 16 × 1000)
Less: Post split-off cost (Further processing cost)	-	(1,20,000)
Net Realisable Value	8,40,000	75,60,000
Apportionment of Joint Cost of ₹51,00,000 in ratio of 1:9	5,10,000	45,90,000

$$\text{Joint cost} = (\text{₹}100 \times 50 \times 1000) + \text{₹}1,00,000 = \text{₹} 51,00,000$$

## (b) Further processing of Butter into Ghee decision:

Incremental revenue	=	₹480 × 16 × 1000 - ₹360 × 20 × 1000	=	₹4,80,000
Incremental cost	=	₹1,20,000		
Incremental benefit	=	₹4,80,000 - ₹1,20,000	=	₹3,60,000

The operating income of 'Buttery Butter' will be reduced by ₹3,60,000 in February if it sells 20 tonne of Butter to 'Healthy Bones', instead of further processing of Butter into Ghee for sale. Thus, 'Buttery Butter' is advised not to accept the offer and further process butter to make Ghee itself.

## TEST 11 – BUDGET AND BUDGETARY CONTROL

### Question 1

The Budget manager of Jaypee Electricals Ltd. is preparing a flexible budget for the accounting year commencing from 1<sup>st</sup> April, 2017. Normal capacity of production of the company is 1,25,000 units.

The company produces one product, a component - PEEKAY. Direct material costs ₹7 per unit. Direct labour averages ₹2.50 per hour and requires 1.60 hours to produce on unit of PEEKAY. Salesmen are paid a commission of ₹1 per unit sold.

Fixed selling and administration expenses amount to ₹85,000 per year. Manufacturing overhead has been estimated in the following amounts under specified conditions of volume:

Particulars	1,20,000 units	1,50,000 units
Indirect materials	2,64,000	3,30,000
Indirect Labour	1,50,000	1,87,500
Inspection	90,000	1,12,500
Maintenance	84,000	1,02,000
Supervision	1,98,000	2,34,000
Depreciation (Plant & Equipment)	90,000	90,000
Engineering services	94,000	94,000
<b>Total Manufacturing Overhead</b>	<b>9,70,000</b>	<b>11,50,000</b>

Prepare a budget of total cost at 1,40,000 units of output.

**(10 Marks)**

### Question 2

Jigyasa Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 2017-18. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

	Minimax (MM)	Heavyhigh (HH)
Budgeted production (in units)	1,80,000	1,20,000
Direct material per unit	₹220.00	₹280.00
Direct labour per unit	₹130.00	₹120.00
Other manufacturing expenses	₹4,00,000	₹5,00,000

The estimated units to be sold in the first four months of the year 2017-18 are as under:

	April	May	June	July
Minimax (MM)	8,000	10,000	12,000	16,000
Heavyhigh (HH)	6,000	8,000	9,000	14,000

You are required to:

- (a) Prepare a production budget for the first quarter in month-wise.
- (b) Present production cost budget for first quarter.

**(5 Marks)**

### Question 3

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 ₹4 and ₹6 per kg and labours are paid 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 the budgeted period are as below:

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

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

**(10 Marks)**

**SOLUTION TEST 11 – BUDGET AND BUDGETARY CONTROL****Solution 1**

## Flexible Budget

Particulars		Amount (₹)
(A)	Variable Cost:	
	Direct materials	(1,40,000 × ₹7) 9,80,000
	Direct labour	(1,40,000 × 1.6 hours × ₹2.5) 5,60,000
	Salesmen commission	(1,40,000 × ₹1) 1,40,000
	Indirect materials	{(₹2,64,000 ÷ 1,20,000) × 1,40,000} 3,08,000
	Indirect Labour	{(₹1,50,000 ÷ 1,20,000) × 1,40,000} 1,75,000
	Inspection	{(₹90,000 ÷ 1,20,000) × 1,40,000} 1,05,000
	Total (A)	22,68,000
(B)	Fixed Cost:	
	Selling and administration	85,000
	Depreciation	90,000
	Engineering services	94,000
	Total (B)	2,69,000
(C)	Semi Variable Cost:	
	Maintenance:	
	Variable	(1,40,000 × ₹0.60) 84,000
	Fixed	12,000
	Supervision:	
	Variable	(1,40,000 × ₹1.20) 1,68,000
	Fixed	54,000
	Total (C)	3,18,000
	Total Cost (A + B + C)	28,55,000

Working Note: Calculation of variable cost per unit and fixed cost portion of semi variable items:

Variable cost per unit	=	$\frac{\text{Difference in Total Cost}}{\text{Difference in Units}}$	
Variable Maintenance cost per unit	=	$\frac{1,02,000 - 84,000}{1,50,000 - 1,20,000}$	= ₹0.60 per unit
Variable Supervision cost per unit	=	$\frac{2,34,000 - 1,98,000}{1,50,000 - 1,20,000}$	= ₹1.20 per unit
Fixed cost	=	Total cost – Variable Cost	
Fixed Maintenance cost	=	84,000 – 1,20,000 × 0.60	= ₹12,000
Fixed Maintenance cost	=	1,98,000 – 1,20,000 × 1.20	= ₹54,000

**Solution 2**

(a) Production Budget of Product Minimax and Heavyhigh (in units)

Particulars	April		May		June		Total	
	MM	HH	MM	HH	MM	HH	MM	HH
Sales	8,000	6,000	10,000	8,000	12,000	9,000	30,000	23,000
Add: Closing Stock (25% of next month's sales)	2,500	2,000	3,000	2,250	4,000	3,500	9,500	7,750
Less: Opening Stock	*2,000	*1,500	2,500	2,000	3,000	2,250	7,500	5,750
Production in units	8,500	6,500	10,500	8,250	13,000	10,250	32,000	25,000

Note: Opening stock of April is the closing stock of March, which is as per company's policy 25% of next month's sales.

(b) Production Cost Budget

Elements of cost	Minimax (MM)		Heavyhigh (HH)	
	Per unit	Total (₹)	Per unit	Total (₹)
No of units	1	32,000	1	25,000
Direct Material	220	70,40,000	280	70,00,000
Direct Labour	130	41,60,000	120	30,00,000
Manufacturing Overhead:				
MM: ₹4,00,000 for 1,80,000 units	2.22	71,111	-	-
HH: ₹5,00,000 for 1,20,000 units	-	-	4.167	1,04,167
Production Cost	352.22	1,12,71,111	404.167	1,01,04,167

**Solution 3**

## (i) Material Purchase Budget

Particulars	Material X	Material Y
Materials consumed: Product A @ 5 kg/4 kg per unit of 2,480 units	12,400	9,920
Product B @ 3 kg/6 kg per unit of 4,300 units	12,900	25,800
Total consumption (in kg)	25,300	35,720
Add: Closing Stock:		
Materials X $(\frac{25,300}{20 \text{ days}} \times 10 \text{ days})$	12,650	-
Materials Y $(\frac{35,720}{20 \text{ days}} \times 6 \text{ days})$	-	10,716
Less: Opening Stock of Raw Material	(1,000)	(500)
Quantity of materials to be purchased (in kg)	36,950	45,936
Rate per kg	₹4	₹6
Material Purchase (in ₹)	₹1,47,800	₹2,75,616

## (ii) Wages Budget

Particulars	Product A	Product B
Units to be produced	2,480	4,300
Standard hours allowed per unit	3	5
Total standard hours allowed	7,440	21,500
Productive hours required for production (80% efficiency)		
Product A $(7,440 \div 80\%)$	9,300	-
Product B $(21,500 \div 80\%)$	-	26,875
Add: Non-productive down time @ 20% of productive hours	1,860	5,375
Total hours to be paid	11,160	32,250
Total hours to be paid (11,160 + 32,250)		43,410
Normal hours (4 weeks × 40 hours × 180 workers)		28,800
Overtime hours (43,410 - 28,800)		14,610
Wages to be paid:		
Normal hours @ ₹25 per hour for 28,800 hours		₹7,20,000
Overtime hours @ ₹37.50 (25 + 50%) per hour for 14,610 hours		₹5,47,875
Total Wages paid (in ₹)		₹12,67,875

Working notes:

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

(2) Calculation of number of units to be produced:

Particulars	Product A	Product B
Units to be sold	2,400	3,600
Add: Closing Stock:		
Product A $(\frac{2,400}{20 \text{ days}} \times 4 \text{ days})$	480	-
Product B $(\frac{3,600}{20 \text{ days}} \times 5 \text{ days})$	-	900
Less: Opening Stock	(400)	(200)
Units to be produced	2,480	4,300

**TEST 12 – STANDARD COSTING****Question 1**

NPX Ltd. uses standard costing system for manufacturing of its product X. Following is the budget data given in relation to labour hours for manufacture of 1 unit of Product X:

Labour	Hours	Rate (₹)
Skilled	2	6
Semi-Skilled	3	4
Un-Skilled	5	3
Total	10	-

In the month of January, 2020, total 10,000 units were produced following are the details:

Labour	Hours	Rate (₹)	Amount (₹)
Skilled	18,000	7	1,26,000
Semi-Skilled	33,000	3.5	1,15,500
Un-Skilled	58,000	4	2,32,000
Total	1,09,000	-	4,73,500

Actual Idle hours (abnormal) during the month:

Skilled	500
Semi-Skilled	700
Un-skilled	800
Total	2,000

Calculate:

- (a) Labour Variances.  
 (b) Also show the effect on Labour Rate Variance if 5,000 hours of Skilled Labour are paid @ ₹5.5 per hour and balance were paid @ ₹7 per hour.

**(10 Marks)**

**Question 2**

The following information was obtained from the records of a manufacturing unit using standard costing system.

Particulars	Standard	Actual
Production	4,000 units	3,800 units
Working Days	20	21
Machine hours	8,000 hours	7,800 hours
Fixed Overhead	₹4,00,000	₹3,90,000
Variable Overhead	₹1,20,000	₹1,20,000

You are required to calculate the following overhead variance:

- (a) Variable overhead variances  
 (b) Fixed overhead variances

**(10 Marks)**

**Question 3**

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

1. Estimation:

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

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

2. Actuals: 1480 kg of output produced.

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

3. Other Information:

Material Cost Variance	₹3,625 (F)
Material Price Variance	₹175 (F)

You are required to calculate:

- Standard Price of Material A;
- Actual Quantity of Material B;
- Actual Price of Material A;
- Revised standard quantity of Material A and Material B; and
- Material Mix Variance.

**(10 Marks)**

#### Question 4

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

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

During the month of August, 2020 10,000 units of 'Star 95 Mask' were manufactured. Details are as follows:

Direct material consumed 5,700 meters @ ₹58 per meter	
Direct labour Hours ? @ ?	₹2,24,400
Variable overhead incurred	₹1,12,200

Variable overhead efficiency variance is ₹ 2,000 A. Variable overheads are based on Direct Labour Hours.

You are required to calculate the missing data and all the relevant Variances.

**(10 Marks)**

**SOLUTION TEST 12 – STANDARD COSTING****Solution 1**

(a) Calculation of Labour Variances:

1. Labour Cost Variance	=	(SH × SR) – (AH × AR)	=	₹3,90,000 – ₹4,73,500	=	₹83,500 A
2. Labour Rate Variance	=	(AH × SR) – (AH × AR)	=	₹4,14,000 – ₹4,73,500	=	₹59,500 A
3. Labour Efficiency Variance	=	(SH × SR) – (AHW × SR)	=	₹3,90,000 – ₹4,05,800	=	₹15,800 A
4. Labour Mix Variance	=	(RH × SR) – (AHW × SR)	=	₹4,17,300 – ₹4,05,800	=	₹11,500 F
5. Labour Yield Variance	=	(SH × SR) – (RH × SR)	=	₹3,90,000 – ₹4,17,300	=	₹27,300 A
6. Labour Idle Variance	=	(AHW × SR) – (AH × SR)	=	₹4,05,800 – ₹4,14,000	=	₹8,200 A

(b) Labour Rate Variance revised:

Labour rate Variance	=	(AH × SR) – (AH × AR)	
Skilled	=	(18,000 × 6) – (5,000 × 5.5 + 13,000 × 7)	= 10,500 A
Semi-Skilled	=	33,000 × (4 – 3.5)	= 16,500 F
Un-Skilled	=	58,000 × (3 – 4)	= 58,000 A
Total	=	10,500 A + 16,500 F + 58,000 A	= ₹52,000 A

Effect on Labour Rate Variance = Adverse effect decreased by ₹7,500 (₹59,500A to ₹52,000 A)

Working notes:

## 1. Basic Calculation

Workers	SH × SR	RH × SR	AHW × SR	AH × SR	AH × AR
Skilled	20,000 × 6	21,400 × 6	17,500 × 6	18,000 × 6	18,000 × 7
Semi-Skilled	30,000 × 4	32,100 × 4	32,300 × 4	33,000 × 4	33,000 × 3.5
Un-Skilled	50,000 × 3	53,500 × 3	57,200 × 3	58,000 × 3	58,000 × 4
Total	₹3,90,000	₹4,17,300	₹4,05,800	₹4,14,000	₹4,73,500

2. RH (Revised Hours):

Total Actual Hours Worked	=	17,500 + 32,300 + 57,200	=	1,07,000 hours
Skilled	=	1,07,000 × 2/10	=	21,400 hours
Semi-Skilled	=	1,07,000 × 3/10	=	32,100 hours
Un-Skilled	=	1,07,000 × 5/10	=	53,500 hours

3. SH (Standard hours) for actual output 10,000 units:

Skilled	=	10,000 × 2	=	20,000 hours
Semi-Skilled	=	10,000 × 3	=	30,000 hours
Un-Skilled	=	10,000 × 5	=	50,000 hours

**Solution 2**

(a) Variable Overheads Variances:

Variable OH Cost variance	=	$(SH \times SR) - (AH \times AR)$	
	=	$(7,600 \times ₹15) - ₹1,20,000$	= 6,000 A
Variable OH Expenditure Variance	=	$(AH \times SR) - (AH \times AR)$	
	=	$(7,800 \times ₹15) - ₹1,20,000$	= 3,000 A
Variable OH Efficiency Variance	=	$(SH \times SR) - (AH \times SR)$	
	=	$(7,600 \times ₹15) - (7,800 \times ₹15)$	= 3,000 A

(b) Fixed Overhead Variances:

Fixed OH Cost Variance	=	$(SH \times SR) - (AH \times AR)$	
	=	$(7,600 \times ₹50) - ₹3,90,000$	= 10,000 A
Fixed OH Expenditure Variance	=	$(BH \times SR) - (AH \times AR)$	
	=	$₹4,00,000 - ₹3,90,000$	= 10,000 F
Fixed OH Volume Variance	=	$(SH \times SR) - (BH \times SR)$	
	=	$(7,600 \times ₹50) - ₹4,00,000$	= 20,000 A
Fixed OH Efficiency Variance	=	$(SH \times SR) - (AH \times SR)$	
	=	$(7,600 \times ₹50) - (7,800 \times ₹50)$	= 10,000 A
Fixed OH Capacity Variance	=	$(AH \times SR) - (CH \times SR)$	
	=	$(7,800 \times ₹50) - (8,400 \times ₹50)$	= 30,000 A
Fixed OH Calendar Variance	=	$(CH \times SR) - (BH \times SR)$	
	=	$(8,400 \times ₹50) - ₹4,00,000$	= 20,000 F

Working Notes:

(a) Standard Hours (SH) for 3,800 units	=	$(8,000 \text{ hours} \div 4,000 \text{ units}) \times 3,800 \text{ units}$	
	=	7,600 hours	
(b) Standard Rate (SR) Variable OH	=	$\text{Budgeted Variable Overheads} \div \text{Budgeted Hours}$	
	=	$₹1,20,000 \div 8,000 \text{ hours} = ₹15 \text{ per hour}$	
(c) Standard Rate (SR) Fixed OH	=	$\text{Budgeted Fixed Overheads} \div \text{Budgeted Hours}$	
	=	$₹4,00,000 \div 8,000 \text{ hours} = ₹50 \text{ per hour}$	
(d) Calendar Hours	=	$(8,000 \text{ hours} \div 20 \text{ days}) \times 21 \text{ days}$	
	=	8,400 hours	
(e) Standard Rate (SR) Fixed OH	=	$\text{Budgeted Fixed Overheads} \div \text{Budgeted Hours}$	
	=	$₹4,00,000 \div 8,000 \text{ hours} = ₹50 \text{ per hour}$	

**Solution 3**

(a) Material Cost Variance	=	$(SQ \times SP) - (AQ \times AP)$	
₹3,625	=	$(SQ \times SP) - ₹59,825$	
$(SQ \times SP)$	=	₹63,450	
$(SQ_A \times SP_A) + (SQ_B \times SP_B)$	=	₹63,450	
$(940 \text{ kg} \times SP_A) + (705 \text{ kg} \times ₹30)$	=	₹63,450	
$(940 \text{ kg} \times SP_A) + ₹21,150$	=	₹63,450	
$(940 \text{ kg} \times SP_A)$	=	₹42,300	
$SP_A$	=	$42,300 \div 940 \text{ kg}$	

$$\text{Standard Price of Material A} = ₹45$$

Working notes:

$$\begin{aligned}
 1. \quad \text{SQ of input for actual output} &= 1,480 \text{ kg} \div 90\% = 1,645 \text{ kgs} \\
 \text{Materials A} &= 1,645 \text{ kgs} \times 8/14 = 940 \text{ kgs} \\
 \text{Materials B} &= 1,645 \text{ kgs} \times 6/14 = 705 \text{ kgs} \\
 \\
 \text{(b) Material Price Variance (A + B)} &= (\text{AQ} \times \text{SP}) - (\text{AQ} \times \text{AP}) \\
 ₹175 &= (\text{AQ} \times \text{SP}) - ₹59,825 \\
 (\text{AQ} \times \text{SP}) &= ₹60,000 \\
 (\text{AQ}_A \times \text{SP}_A) + (\text{AQ}_B \times \text{SP}_B) &= ₹60,000 \\
 (900 \text{ kg} \times ₹45) + (\text{AQ}_B \times ₹30) &= ₹60,000 \\
 (\text{AQ}_B \times ₹30) &= ₹60,000 - ₹40,500 = ₹19,500 \\
 \\
 \text{Actual Quantity of Material B} &= ₹19,500 \div ₹30 = 650 \text{ kg.} \\
 \\
 \text{(c) Actual Material Cost (A + B)} &= (\text{AQ} \times \text{AP}) = ₹59,825 \\
 (\text{AQ}_A \times \text{AP}_A) + (\text{AQ}_B \times \text{AP}_B) &= ₹59,825 \\
 (900 \text{ kg} \times \text{AP}_A) + (650 \text{ kg} \times ₹32.5) &= ₹59,825 \\
 (900 \text{ kg} \times \text{AP}_A) + ₹21,125 &= ₹59,825 \\
 (900 \text{ kg} \times \text{AP}_A) &= ₹38,700 \\
 \\
 \text{Actual Price of Material A} &= ₹38,700 \div 900 \text{ kg} = ₹43 \\
 \\
 \text{(d) Revised Standard Quantity (RQ) of A \& B:} \\
 \text{Materials A} &= (900 + 650) \times 8/14 = 886 \text{ kgs} \\
 \text{Materials B} &= (900 + 650) \times 6/14 = 664 \text{ kgs} \\
 \\
 \text{(e) Material Mix Variance (A + B)} &= (\text{RQ} \times \text{SP}) - (\text{AQ} \times \text{SP}) \\
 &= (886 \times 45) + (664 \times 30) - 60,000 \\
 &= ₹210 \text{ A}
 \end{aligned}$$

**Solution 4**

1. Material Variances:

$$\begin{aligned}
 \text{(a) Material Cost Variance} &= (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP}) \\
 &= (10,000 \text{ units} \times 0.5 \text{ meter} \times ₹60) - (5,700 \times ₹58) \\
 &= ₹30,600 \text{ A} \\
 \\
 \text{(b) Material Price Variance} &= (\text{AQ} \times \text{SP}) - (\text{AQ} \times \text{AP}) \\
 &= (5,700 \times ₹60) - (5,700 \times ₹58) = ₹11,400 \text{ F} \\
 \\
 \text{(c) Material Usage Variance} &= (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{SP}) \\
 &= (10,000 \text{ units} \times 0.5 \text{ meter} \times ₹60) - (5,700 \times ₹60) \\
 &= ₹42,000 \text{ A}
 \end{aligned}$$

2. Variable Overheads Variances:

$$\begin{aligned}
 \text{Variable OH Cost variance} &= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{AR}) \\
 &= (10,000 \times 1 \text{ hour} \times ₹10) - ₹1,12,200 = ₹12,200 \text{ A} \\
 \\
 \text{Variable OH Eff. Variance} &= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{SR}) \\
 ₹2,000 \text{ A} &= (10,000 \times 1 \text{ hour} \times ₹10) - (\text{AH} \times ₹10) \\
 ₹2,000 \text{ A} &= ₹1,00,000 - 10 \text{ AH}
 \end{aligned}$$

$$\text{Actual Hours} = ₹1,02,000 \div ₹10 = 10,200 \text{ hours}$$

$$\begin{aligned} \text{Variable OH Exp. Variance} &= (\text{AH} \times \text{SR}) - (\text{AH} \times \text{AR}) \\ &= (10,200 \times ₹10) - ₹1,12,200 = 10,200 \text{ A} \end{aligned}$$

## 3. Labour Variances:

$$\begin{aligned} \text{Labour Rate Variance} &= (\text{AH} \times \text{SR}) - (\text{AH} \times \text{AR}) \\ &= (10,200 \text{ hours} \times ₹20) - ₹2,24,400 = ₹20,400 \text{ A} \end{aligned}$$

$$\begin{aligned} \text{Labour Efficiency Variance} &= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{SR}) \\ &= (10,000 \text{ units} \times 1 \text{ hour} \times ₹20) - (10,200 \text{ hours} \times ₹20) \\ &= ₹4,000 \text{ A} \end{aligned}$$

$$\begin{aligned} \text{Labour Cost Variance} &= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{AR}) \\ &= (10,000 \text{ units} \times 1 \text{ hour} \times ₹20) - ₹2,24,400 \\ &= ₹24,400 \text{ A} \end{aligned}$$

$$\begin{aligned} \text{Actual Labour rate} &= \text{Actual Labour Cost} \div \text{AH} \\ &= ₹2,24,400 \div 10,200 \text{ hours} = ₹22 \end{aligned}$$

## TEST 13 – MARGINAL COSTING

### Question 1

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:

Per unit	Part A	Part B
Alloy usage	1.6 kgs.	1.6 kgs.
Machine Time: Machine A	0.6 hrs.	0.25 hrs.
Machine Time: Machine B	0.5 hrs.	0.55 hrs.
Target Price (₹)	145	115

Total hours available for Machine A: 4,000 hours and for Machine B: 4,500 hours. Alloy available is 13,000 kgs @ ₹12.50 per kg. Variable overheads per machine hours for Machine A: ₹80 and for Machine B: ₹100

Required:

- Identify the spare part which will optimize contribution at the offered price.
- If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machine hour, what will be the total contribution from the spare part identified above?

**(10 Marks)**

### Question 2

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
Sales	₹8,00,000	₹16,00,000
Production costs:		
Variable	₹3,20,000	₹6,40,000
Fixed	₹1,60,000	₹1,60,000
Selling and distribution costs:		
Variable	₹1,60,000	₹3,20,000
Fixed	₹2,40,000	₹2,40,000

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:

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

**(10 Marks)**

### Question 3

SHA Limited provides the following trading results:

Year	Sales	Profit
2012-13	₹25,00,000	10% of Sale
2013-14	₹20,00,000	8% of Sale

You are required to calculate:

- Fixed Cost

- (2) Break Even Point  
 (3) Amount of profit, if sale is ₹30,00,000  
 (4) Sale, when desired profit is ₹4,75,000  
 (5) Margin of Safety at a profit of ₹2,70,000

(5 Marks)

**Question 4**

Prisha Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	A	B	C
Sales Mix	40%	35%	25%
Selling Price	₹300	₹400	₹200
Variable Cost	₹150	₹200	₹120
Total Fixed Costs			₹18,00,000
Total Sales			₹60,00,000

The company has currently under discussion, a proposal to discontinue the manufacture of Product C and replace it with Product E, when the following results are anticipated:

	Products		
	A	B	E
Sales Mix	45%	30%	25%
Selling Price	₹300	₹400	₹300
Variable Cost	₹150	₹200	₹150
Total Fixed Costs			₹18,00,000
Total Sales			₹64,00,000

Required:

- (a) Calculate the total contribution to sales ratio and present break-even sales at existing sales mix.  
 (b) Calculate the total contribution to sales ratio and present break-even sales at proposed sales mix.  
 (c) State whether the proposed sales mix is accepted or not?

(10 Marks)

**SOLUTION TEST 13 – MARGINAL COSTING****Solution 1**

## 1. Statement Showing Optimum Contribution

Particulars	Part A	Part B
Maximum units to be manufactured and sold	6,666	8,125
Sales Price	145	115
Less: Materials 1.60 kgs. @ ₹12.50 per kg	20	20
Variable overheads Machine A 0.6/.25 hour @ ₹80	48	20
Variable overheads Machine B 0.5/.55 hour @ ₹100	50	55
Contribution per unit	27	20
Maximum Contribution (Contribution per unit × Max. units)	1,79,982	1,62,500

Calculation of maximum number of units that can be produced under various limiting factor:

Particulars	Part A	Part B
Machine A (4,000 hours)	6,666 (4,000 ÷ 0.6)	16,000 (4,000 ÷ 0.25)
Machine B (4,500 hours)	9,000 (4,500 ÷ 0.5)	8,181 (4,500 ÷ 0.55)
Alloy Available (13,000 kg.)	8,125 (13,000 ÷ 1.6)	8,125 (13,000 ÷ 1.6)
Maximum number of part to be manufactured (least of all)	6,666	8,125

Spare Part A will optimize the contribution.

## 2. Statement Showing Revised Contribution

Particulars	Part A
Parts to be manufactured	6,666
Machine A to be used (0.6 × 6,666)	4,000
Machine B to be used (0.5 × 6,666)	3,333
Underutilized machine hours (4,500 – 3,333)	1,167
Compensation for unutilized machine hours (1,167 × ₹60)	70,020
Reduction in price by 10% (6,666 × 145 × 10%)	96,657
Total revised contribution (1,79,982 + 70,020 – 96,657)	1,53,345

**Solution 2**

(a) Fixed production costs absorbed:

Budgeted fixed production costs	₹1,60,000
Budgeted output (Normal level of activity 800 units)	
Therefore, the absorption rate (₹1,60,000 ÷ 800)	₹200 per unit
Fixed cost recovered (During the first quarter, 220 units × ₹200)	₹44,000

(b) Under/over-recovery of overheads during the period:

Actual fixed production overhead (¼ of ₹1,60,000)	₹40,000
Absorbed fixed production overhead	₹44,000
Over-recovery of overheads	₹4,000

(c) Profit for the Quarter (Absorption Costing)

Activity Level	₹	₹
Sales revenue (160 units × ₹2,000)		3,20,000
Production costs:		
Variable (220 units × ₹800)	1,76,000	
Fixed overheads absorbed (220 units × ₹200)	44,000	2,20,000
Cost of production		2,20,000

Add: Opening stock		Nil
Less: Closing stock ( $\text{₹}2,20,000 \div 220 \text{ units}$ ) $\times 60$ units		(60,000)
Cost of goods sold		1,60,000
Less: Adjustment for over recovery of fixed overheads		(4,000)
Add: Selling and distribution costs:		
Variable (160 units $\times$ ₹400)	64,000	
Fixed ( $\frac{1}{4}$ of ₹2,40,000)	60,000	1,24,000
Cost of sales		2,80,000
Profit (Sales – Cost of sales)		40,000

(d) Profit for the Quarter (Marginal costing)

Activity Level	₹	₹
Sales revenue (160 units $\times$ ₹2,000)		3,20,000
Production costs:		
Variable (220 units $\times$ ₹800)		1,76,000
Cost of production		1,76,000
Add: Opening stock		Nil
Less: Closing stock ( $\text{₹}1,76,000 \div 220 \text{ units}$ ) $\times 60$ units		(48,000)
Cost of goods sold		1,28,000
Add: Selling and distribution costs:		
Variable (160 units $\times$ ₹400)		64,000
Cost of sales		1,92,000
Contribution (Sales – Variable Cost of sales)		1,28,000
Less: Fixed costs:		
Production	40,000	
Selling & distribution	60,000	(1,00,000)
Profit		28,000

(e) Difference in profit between both techniques is due to difference in valuation of closing stock:

Profit as per Marginal costing	28,000
Add: under valuation of closing stock in marginal costing (60,000 – 48,000)	12,000
Profit as per Absorption costing	40,000

### Solution 3

(1) Calculation of Fixed Cost (by using data of year 2012-13):

$$\begin{aligned} \text{Fixed cost} &= \text{Contribution} - \text{profit} = (\text{Sales} \times \text{PV Ratio}) - 10\% \text{ of Sale} \\ &= (\text{₹}25,00,000 \times 18\%) - 10\% \text{ of } \text{₹}25,00,000 = \text{₹}2,00,000 \end{aligned}$$

(2) Calculation of Break Even Point:

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{2,00,000}{18\%} = \text{₹}11,11,111.11$$

(3) Calculation of Amount of profit, if Sale is ₹30,00,000:

$$\begin{aligned} \text{Profit} &= \text{Contribution} - \text{Fixed Cost} \\ &= \text{₹}30,00,000 \times 18\% - 2,00,000 = \text{₹}3,40,000 \end{aligned}$$

(4) Sales, when desired profit is ₹4,75,000:

$$\begin{aligned} \text{Sales} &= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} = \frac{2,00,000 + 4,75,000}{18\%} \\ &= \text{₹}37,50,000 \end{aligned}$$

(5) Margin of Safety at a profit of ₹2,70,000:

$$\text{MOS} = \frac{\text{Pr ofit}}{\text{PV Ratio}} = \frac{2,70,000}{18\%} = ₹15,00,000$$

Working Note:

$$\begin{aligned} \text{PV Ratio} &= \frac{\text{Difference in Pr ofit}}{\text{Difference in Sales}} \times 100 \\ &= \frac{10\% \text{ of } 25,00,000 - 8\% \text{ of } 20,00,000}{25,00,000 - 20,00,000} \times 100 = \frac{90,000}{5,00,000} \times 100 \\ &= 18\% \end{aligned}$$

#### Solution 4

(a) Calculation of Contribution to sales ratio at existing sales mix:

	Products			Total
	A	B	C	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	
Contribution per unit (₹)	150	200	80	
P/V Ratio	50%	50%	40%	
Sales Mix	40%	35%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	20%	17.5%	10%	47.5%
Present Total Contribution (₹60,00,000 × 47.5%)				₹28,50,000
Less: Fixed Costs				₹18,00,000
Present Profit				₹10,50,000
Present Break-Even Sales (₹18,00,000/0.475)				₹37,89,473.68

(b) Calculation of Contribution to sales ratio at proposed sales mix:

	Products			Total
	A	B	E	
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	80	
P/V Ratio	50%	50%	50%	
Sales Mix	45%	30%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	22.5%	15%	12.5%	50%
Present Total Contribution (₹64,00,000 × 50%)				₹32,00,000
Less: Fixed Costs				₹18,00,000
Present Profit				₹14,00,000
Present Break-Even Sales (₹18,00,000/0.5)				₹36,00,000

(c) The proposed sales mix increases the total contribution to sales ratio from 47.5% to 50% and the total profit from ₹10,50,000 to ₹14,00,000. Thus, the proposed sales mix should be accepted.

**TEST 14 – COST ACCOUNTING SYSTEM****Question 1**

The following balances were extracted from a company's ledger as on 31<sup>st</sup> December 1997:

Name of Account	Dr.	Cr.
Raw materials control A/c	48,836	-
Work in progress Control A/c	14,745	-
Finished Stock Ledger Control A/c	21,980	-
Cost ledger control A/c	-	85,561
Total	85,561	85,561

Further transactions took place during the following quarter as follows:

Direct wages	18,370
Factory overhead allocated to WIP	11,786
Goods Finished at cost	36,834
Raw materials purchased	22,422
Cost of goods sold	42,000
Raw materials issued to production	17,000
Raw materials credited by suppliers	1,000
Inventory audit raw material losses	1,300
WIP rejected (with no scrap value)	1,800
Customer's return (at cost) of finished goods	3,000

Prepare all the ledger accounts in cost ledger.

**(10 Marks)**

**Question 2**

The following figures have been extracted from the cost records of a manufacturing unit:

Stores:

Opening balance	32,000
Purchases of materials	1,58,000
Transfer from work-in-progress	80,000
Issues to work-in-progress	1,60,000
Issues to repairs	20,000
Deficiencies found in stock-taking	6,000

Work-in-progress:

Opening balance	60,000
Direct wages applied	65,000
Overheads applied	2,40,000
Closing balance of WIP	45,000

Entire output is sold at a profit of 10% on actual cost from work-in-progress.

Wages incurred	70,000
Overhead incurred	2,50,000

Items not included in cost records:

Income from investment	10,000
Loss on sale of capital assets	20,000

Draw up Store Control account, Work-in-progress Control account, Costing Profit and Loss account, Profit and Loss account and Reconciliation statement.

**(10 Marks)**

**Question 3**

The following information is available from a company's records for March, 2016:

(a) Opening balance of Creditors Account	₹25,000
(b) Closing balance of Creditors Account	₹40,000
(c) Payment made to Creditors	₹5,80,000
(d) Opening balance of Stores Ledger Control Account	₹40,000
(e) Closing balance of Stores Ledger Control Account	₹65,000
(f) Wages paid (for 8,000 hours) 20% relate to indirect workers	₹4,00,000
(g) Various indirect expenses incurred	₹60,000
(h) Opening balance of WIP Control Account	₹50,000
(i) Inventory of WIP at the end includes:	
Material worth	₹35,000
Labour hours booked	400 hours
(j) Budgeted:	
Overhead cost	₹20,80,000
Labour hours	1,04,000
(k) Factory overhead is charged to production at budgeted rate based on direct labour hours.	

You are required to prepare Creditors A/c, Stores Ledger Control A/c, WIP Control A/c, Wages Control A/c and Factory Overhead Control A/c.

**(10 Marks)**

**SOLUTION TEST 14 – COST ACCOUNTING SYSTEM****Solution 1**

## Raw Material Control A/c

Particulars	Amount	Particulars	Amount
To Bal b/d	48,836	By WIP A/c	17,000
To Cost Ledger Control A/c	22,422	By Cost Ledger Control A/c	1,000
		By Cost Ledger Control A/c (Loss)	1,300
		By Bal c/d	51,958
	71,258		71,258

## Wages Control A/c

Particulars	Amount	Particulars	Amount
To Cost Ledger Control A/c	18,370	By WIP A/c	18,370
	18,370		18,370

## Factory Overheads Control A/c

Particulars	Amount	Particulars	Amount
To Cost Ledger Control A/c	11,786	By WIP A/c	11,786
	11,786		11,786

## Work-in-Process Control A/c

Particulars	Amount	Particulars	Amount
To Bal b/d	14,745	By Finished Stock Control A/c	36,834
To Factory OH Control A/c	11,786	By Cost Ledger Control A/c	
To Wages Control A/c	18,370	(Rejected)	1,800
To Raw Material Control A/c	17,000	By Bal c/d	23,267
	61,901		61,901

## Finished Stock Control A/c

Particulars	Amount	Particulars	Amount
To Bal b/d	21,980	By Cost of Sales	42,000
To Work-in-Progress Control A/c	36,834	By Bal c/d	19,814
To Cost of Sales (Return)	3,000		
	61,814		61,814

## Cost of Sales A/c

Particulars	Amount	Particulars	Amount
To Finished Goods Control A/c	42,000	By Finished Goods Control A/c	3,000
		By Bal c/d	39,000
	42,000		42,000

## Cost Ledger Control A/c

Particulars	Amount	Particulars	Amount
To Raw Material Control A/c (Returns)	1,000	By Bal b/d	85,561
To Raw Materials Control A/c (Loss)	1,300	By Raw Material Control A/c	22,422
To WIP Control A/c (Rejected)	1,800	By Wages Control A/c	18,370
To Bal c/d	1,34,039	By Factory OH Control A/c	11,786
	1,38,139		1,38,139

**Solution 2**

## Stores Ledger Control Account

Particulars	Amount	Particulars	Amount
-------------	--------	-------------	--------

To Balance b/d	32,000	By WIP Ledger Control A/c	1,60,000
To Cost Ledger Control A/c	1,58,000	By Work Overhead Control A/c	20,000
To Work in progress Control A/c	80,000	By Costing P/L A/c (assumed abnormal)	6,000
		By Balance c/d	84,000
	2,70,000		2,70,000

## Work in Progress Ledger Control Account

Particulars	Amount	Particulars	Amount
To Balance b/d	60,000	By Stores Control A/c	80,000
To Stores Ledger Control A/c	1,60,000	By Costing Profit and Loss A/c (i.e., cost of sales)	4,00,000
To Direct Wages Control A/c	65,000	By Balance c/d	45,000
To Works Overhead Control A/c	2,40,000		
	5,25,000		5,25,000

## Works Overhead Control Account

Particulars	Amount	Particulars	Amount
To Cost Ledger Control A/c	2,50,000	By WIP Ledger Control A/c	2,40,000
To Store Ledger Control A/c	20,000	By Costing Profit & Loss A/c (under recovery)	35,000
To Wages Control A/c	5,000		
	2,75,000		2,75,000

## Costing Profit &amp; Loss Account

Particulars	Amount	Particulars	Amount
To WIP Control A/c	4,00,000	By Cost Ledger Control A/c (4,00,000 + 10%)	4,40,000
To Works Overhead Control A/c	35,000	By Loss	1,000
To Stores Ledger Control A/c	6,000		
	4,41,000		4,41,000

Recording of transaction in financial books:

## Profit &amp; Loss Account

Particulars	Amount	Particulars	Amount
To Opening stock:		By Sales	4,40,000
Stores           32,000		By Closing stock:	
WIP <u>60,000</u>	92,000	Stores           84,000	
To Purchases	1,58,000	WIP <u>45,000</u>	1,29,000
To Wages incurred	70,000	By Income from investment	10,000
To Overheads incurred	2,50,000	By Loss	11,000
To Loss on sale of capital asset	20,000		
	5,90,000		5,90,000

## Reconciliation statement

Particulars	₹
Loss as per Cost Accounts	(1,000)
Add: Income from investment recorded in financial accounts	10,000
Less: Loss on sale of capital assets only	(20,000)
Loss as per Financial Accounts	(11,000)

**Solution 3**

## Creditors A/c

Particulars	₹	Particulars	₹
To Cash or Bank A/c	5,80,000	By Balance b/d	25,000
To Balance c/d	40,000	By Stores Ledger Control A/c (Balancing figure)	5,95,000
	6,20,000		6,20,000

## Stores Ledger Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	40,000	By Work-in-progress Control A/c	5,70,000
To Creditors A/c (Purchase: figure from creditor A/c)	5,95,000	(Balancing figure)	
	6,35,000	By Balance b/d	65,000
			6,35,000

## Work-in-progress Ledger Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	50,000	By Finished Goods Control A/c (b.f.)	10,05,000
To Stores Ledger Control A/c	5,70,000	By Balance c/d:	
To Wages Control A/c	3,20,000	Material	₹35,000
To Factory Overhead Control A/c	1,28,000	Labour (400 hrs × ₹50)	₹20,000
		Overheads (400 hrs × ₹20)	₹8,000
	10,68,000		63,000
			10,68,000

## Wages Control A/c

Particulars	₹	Particulars	₹
To Bank A/c	4,00,000	By WIP Ledger Control A/c (8,000 hours × 80% × 50)	3,20,000
		By Factory Overhead Control A/c (8,000 hours × 20% × 50)	80,000
	4,00,000		4,00,000

## Factory Overhead Control A/c

Particulars	₹	Particulars	₹
To Bank A/c	60,000	By WIP Ledger Control A/c (6,400 hrs × ₹20)	1,28,000
To Wages Control A/c	80,000	By Costing P/L A/c (Under-absorbed Overheads)	12,000
	1,40,000		1,40,000

## Working notes:

- Direct Labour Hour Rate = Labour Cost ÷ Labour Hour  
= ₹4,00,000 ÷ 8,000 hours = ₹50 per hour
- Factory Overhead Rate = Budgeted Factory Overheads ÷ Budgeted Labour Hours  
= ₹20,80,000 ÷ 1,04,000 = ₹20 per hour

## TEST 15 – RECONCILIATION

### Question 1

M/s Sellwell Ltd. has furnished you the following information from the financial books for the year ended 31<sup>st</sup> December 2016:

M/s Sellwell Ltd.  
Profit & Loss Account  
(For the year ended 31<sup>st</sup> December 2016)

Particulars	Amount	Particulars	Amount
To Opening finished goods (500 units × ₹17.50 per unit)	8,750	By Sales (10,250 units)	3,58,750
To Direct Materials Consumed	1,30,000	By Closing finished goods (250 units × ₹25 per unit)	6,250
To Direct Wages	75,000		
To Gross profit	1,51,250		
	3,65,000		3,65,000
To Factory overheads	47,375	By Gross profit	1,51,250
To Administration overheads	53,000	By Interest	125
To Selling expenses	27,500	By Rent received	5,000
To Bad debts	2,000		
To Preliminary expenses	2,500		
To Net profit	24,000		
	1,56,375		1,56,375

The cost sheet shows:

- (a) The cost of materials as ₹13 per unit.
- (b) The labour cost as ₹7.50 per unit.
- (c) The factory overheads are absorbed at 60% of labour cost.
- (d) The administration overheads (related to production) are absorbed at 20% of factory cost.
- (e) Selling expenses are charged at ₹3 per unit.
- (f) The opening stock of finished goods is valued at ₹22.50 per unit.

You are required to prepare:

- (1) The cost sheet showing elements of cost (use FIFO method for stock valuation),
- (2) The statement showing the reconciliation of profit or loss as shown by the cost accounts with the profit as shown by the financial accounts.

**(10 Marks)**

### Question 2

A manufacturing company disclosed a net loss of ₹3,47,000 as per their cost accounts for the year ended March 31, 2003. The financial accounts however disclosed a net loss of ₹5,10,000 for the same period.

The following information was revealed as a result of scrutiny of the figures of both the sets of accounts:

(a) Factory overheads under-absorbed	40,000
(b) Administration overheads over-absorbed	60,000
(c) Depreciation charged in financial accounts	3,25,000
(d) Depreciation charged in cost accounts	2,75,000
(e) Interest on investments not included in cost accounts	96,000
(f) Income-tax provided	54,000
(g) Interest on loan funds in financial accounts	2,45,000
(h) Transfer fees (credited in financial books)	24,000
(i) Stores adjustment (credited in financial books)	14,000
(j) Dividend received	32,000

Prepare a Memorandum Reconciliation Account.

**(5 Marks)**

**SOLUTION TEST 15 – RECONCILIATION****Solution 1**

## (1) Cost Sheet

Particulars	Amount (₹)
Direct materials @ ₹13 for 10,000 units	1,30,000
Direct wages @ ₹7.50 for 10,000 units	75,000
Prime Cost	2,05,000
Factory overheads at 60% of wages	45,000
Factory Cost	2,50,000
Administrative overheads at 20% of factory cost	50,000
Cost of Production	3,00,000
Add: Opening stock of finished goods (500 units × ₹22.50)	11,250
Less: Closing stock of finished goods	(7,500)
Cost of Goods Sold	3,03,750
Selling expenses at ₹3 per unit of 10,250 units	30,750
Cost of sales	3,34,500
Profit (balancing figure)	24,250
Sales	3,58,750

## (2) Reconciliation Statement

Particulars	Amount	Amount
Profit as per Cost Accounts		24,250
Add: Selling expenses over recovered (30,750 – 27,500)	3,250	
Opening stock over valued (11,250 – 8,750)	2,500	
Interest received	125	
Dividend received	5,000	10,875
Less: Factory overheads under recovered (47,375 – 45,000)	2,375	
Administration overheads under recovered (53,000 – 50,000)	3,000	
Closing stock over valued (7,500 – 6,250)	1,250	
Bad debts	2,000	
Preliminary expenses	2,500	(11,125)
Profit as per Financial Accounts		24,000

Working note:

$$(1) \text{ Calculation of units produced} = \text{Units sold} + \text{Closing finished units} - \text{Opening finished units}$$

$$= 10,250 + 250 - 500 = 10,000 \text{ units}$$

$$(2) \text{ Value of closing finished goods} = \frac{\text{Cost of Production}}{\text{Units Produced}} \times \text{Closing finished goods units}$$

$$= \frac{3,00,000}{10,000} \times 250 = ₹7,500$$

**Solution 2**

## Memorandum Reconciliation Account

Particulars	Amount	Particulars	Amount
To Net Loss as per Cost books	3,47,000	By Admin. OH over recovered	60,000
To Factory OH under absorbed	40,000	By Interest on investment	96,000
To Depreciation under charged	50,000	By Transfer fees	24,000
To Income Tax	54,000	By Stores adjustment	14,000
To Interest on loan	2,45,000	By Dividend received	32,000
		By Net loss as per Financial books	5,10,000
	7,36,000		7,36,000

**100 MARKS FULL TEST 1**

Question No. 1 is compulsory.  
Answer any **four** questions out of the remaining **five** questions.  
Working notes should form part of the answer.

**Question 1 (a)**

A Limited a toy company purchases its requirement of raw material from S Limited at ₹120 per kg. The company incurs a handling cost of ₹400 plus freight of ₹350 per order. The incremental carrying cost of inventory of raw material is ₹0.25 per kg per month. In addition the cost of working capital finance on the investment in inventory of raw material is ₹15 per kg per annum. The annual production of the toys is 60,000 units and 5 units of toys are obtained from one kg. of raw material.

Required:

- Calculate the Economic Order Quantity (EOQ) of raw materials.
- Advise, how frequently company should order to minimize its procurement cost. Assume 360 days in a year.
- Calculate the total ordering cost and total inventory carrying cost per annum as per EOQ.

**(5 Marks)**

**Question 1 (b)**

PQR Limited has replaced 72 workers during the quarter ended 31<sup>st</sup> March 2022. The labour rates for the quarter are as follows:

Flux method	16%
Replacement method	8%
Separation method	5%

You are required to ascertain:

- Average number of workers on roll (for the quarter),
- Number of workers left and discharged during the quarter,
- Number of workers recruited and joined during the quarter,
- Equivalent employee turnover rates for the year.

**(5 Marks)**

**Question 1 (c)**

Top-tech a manufacturing company is presently evaluating two possible machines for the manufacture of superior Pen-drives. The following information is available:

Particulars	Machine A (₹)	Machine B (₹)
Sales price per unit	400	400
Variable cost per unit	240	260
Total fixed cost per year	350 Lakhs	200 Lakhs
Capacity (in units)	8,00,000	10,00,000

Required:

- Recommend which machine should be chosen?
- Would you change your answer, if you were informed that the capacities of the two processes are as follows: A - 12,00,000 units; B - 12,00,000 units? Why?

**(5 Marks)**

**Question 1 (d)**

Coal is transported from two mines X & Y and unloaded at plots in a railway station. X is at distance of 15 kms and Y is at a distance of 20 kms from the rail head plots. A fleet of lorries having carrying capacity of 4 tonnes is used to transport coal from the mines. Records reveal that average speed of the lorries is 40 kms per hour when running and regularly take 15 minutes to unload at the rail head.

At Mine X average loading time is 30 minutes per load, while at mine Y average loading time is 25 minutes per load.

Additional Information:

Drivers' wages, depreciation, insurance and taxes, etc. ₹12 per hour

Operated Fuel, oil, tyres, repairs and maintenance, etc. ₹1.60 per km

You are required to prepare a statement showing the cost per tonne kilometre of carrying coal from each mine 'X' and 'Y'.

(5 Marks)

**Question 2 (a)**

In a manufacturing company, the overhead is recovered as follows:

Factory Overheads: a fixed percentage basis on direct wages and  
Administrative overheads: a fixed percentage basis on factory cost.

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

Particulars	Job 1 (₹)	Job 2 (₹)
Direct Materials	1,08,000	75,000
Direct Wages	84,000	60,000
Selling Price	3,33,312	2,52,000
Profit percentage on total cost	12%	20%

You are required to:

- Compute the percentage recovery rates of factory overheads and administrative overheads.
- Calculate the amount of factory overheads, administrative overheads and profit for each of the two jobs.
- Using the above recovery rates, determine the selling price to be quoted for job 3. Additional data pertaining to Job 3 is as follows:

Direct Materials	₹68,750
Direct Wages	₹22,500
Profit percentage on selling price	15%

(10 Marks)

**Question 2 (b)**

The following information pertains to ZB Limited for the year:

Profit volume ratio	30%
Margin of Safety (as % of total sales)	25%
Fixed Cost	₹12,60,000

You are required to calculate:

- Break even sales value (₹),
- Total sales value (₹) at present,
- Proposed sales value (₹) if company wants to earn the present profit after reduction of 10% in fixed cost,
- Sales in value (₹) to be made to earn a profit of 20% on sales assuming fixed cost remains unchanged,
- New Margin of Safety if the sales value at present as computed in (b) decreased by 12.5%.

(5 Marks)

**Question 2 (c)**

SMC Company limited is producing a particular design of toys under the following existing incentive system:

Normal working hours in the week                      48 hours  
Late shift hours in the week                              12 hours  
Rate of payment    Normal working:                      ₹150 per hour

Late shift: ₹300 per hour

Average output per operator for 60 hours per week (including late shift hours): 80 toys.

The company's management has now decided to implement a system of labour cost payment with either the Rowan Premium Plan or the Halsey Premium Plan in order to increase output, eliminate late shift overtime, and reduce the labour cost.

The following information is obtained:

The standard time allotted for ten toys is seven and half hours.  
Time rate: ₹150 per hour (as usual).

Assuming that the operator works for 48 hours in a week and produces 100 toys, you are required to calculate the weekly earning for one operator under:

- (a) The existing Time Rate,
- (b) Rowan Premium Plan and,
- (c) Halsey Premium Plan (50%)

(5 Marks)

**Question 3 (a)**

SR Ltd. is a manufacturer of Garments. For the first three months of financial year 2022-23 commencing on 1<sup>st</sup> April 2022, production will be constrained by direct labour. It is estimated that only 12,000 hours of direct labour hours will be available in each month.

For market reasons, production of either of the two garments must be at least 25% of the production of the other. Estimated cost and revenue per garment are as follows:

Particulars	Shirt (₹)	Short (₹)
Sales price	60	44
Raw materials:		
Fabric @ 12 per meter	24	12
Dyes and cotton	6	4
Direct labour @ 8 per hour	8	4
Fixed overhead @ 4 per hour	4	2
Profit	18	22

From the month of July 2022 direct labour will no longer be a constraint. The company expects to be able to sell 15,000 shirts and 20,000 shorts in July, 2022. There will be no opening stock at the beginning of July 2022. Sales volumes are expected to grow at 10% per month cumulatively thereafter throughout the year. Following additional information is available:

- The company intends to carry stock of finished garments sufficient to meet 40% of the next month's sale from July 2022 onwards.
- The estimated selling price will be same as above.

Required:

- (1) Calculate the number of shirts and shorts to be produced per month in the first quarter of financial year 2022-2023 to maximize company's profit.
- (2) Prepare the following budgets on a monthly basis for July, August and September 2022:
  - (a) Sales budget showing sales units and sales revenue for each product.
  - (b) Production budget (in units) for each product.

(10 Marks)

**Question 3 (b)**

The following data are available from the books and records of A Ltd. for the month of April 2022:

Particulars	Amount
-------------	--------

Stock of raw materials on 1 <sup>st</sup> April 2022	10,000
Raw materials purchased	2,80,000
Manufacturing wages	70,000
Depreciation on plant	15,000
Expenses paid for quality control check activities	4,000
Lease Rent of Production Assets	10,000
Administrative Overheads (Production)	15,000
Expenses paid for pollution control and engineering & maintenance	1,000
Stock of raw materials on 30 <sup>th</sup> April 2022	40,000
Primary packing cost	8,000
Research & development cost (Process related)	5,000
Packing cost for redistribution of finished goods	1,500
Advertisement expenses	1,300

Stock of finished goods as on 1<sup>st</sup> April 2022 was 200 units having a total cost of ₹28,000. The entire opening stock of finished goods has been sold during the month.

Production during the month of April, 2022 was 3,000 units. Closing stock of finished goods as on 30<sup>th</sup> April, 2022 was 400 units.

You are required to:

(1) Prepare a Cost Sheet for the above period showing the:

- (a) Cost of Raw Material consumed
- (b) Prime Cost
- (c) Factory Cost
- (d) Cost of Production
- (e) Cost of goods sold
- (f) Cost of Sales

(2) Calculate selling price per unit, if sale is made at a profit of 20% on sales.

**(10 Marks)**

**Question 4 (a)**

STG Limited is a manufacturer of Chemical 'GK', which is required for industrial use. The complete production operation requires two processes. The raw material first passes through Process I, where Chemical 'G' is produced. Following data is furnished for the month April 2022:

Particulars	(in kgs.)
Opening work-in-progress quantity (Material 100% and conversion 50% complete)	9,500
Material input quantity	1,05,000
Work Completed quantity	83,000
Closing work-in-progress quantity (Material 100% and conversion 60% complete)	16,500

You are further provided that:

Particulars	(in ₹)
Opening work-in-progress quantity	
Material cost	29,500
Processing cost	14,750
Material input cost	3,34,500
Processing cost	2,53,100

Normal process loss may be estimated to be 10% of material input. It has no realizable value. Any loss over and above normal loss is considered to be 100% complete in material and processing.

The Company transfers 60,000 kgs. of output (Chemical G) from Process I to Process II for producing Chemical 'GK'. Further materials are added in Process II which yield 1.20 kg. of Chemical 'GK' for every kg. of Chemical 'G' introduced. The chemicals transferred to Process II for further processing are then sold as Chemical 'GK' for ₹10 per kg. Any quantity of output completed in Process I, are sold as Chemical 'G' @ ₹9 per kg.

The monthly costs incurred in Process II (other than the cost of Chemical 'G') are:

Input 60,000 kg. of Chemical 'G'  
Materials Cost ₹ 85,000  
Processing Costs ₹ 50,000

You are required:

- (a) Prepare Statement of Equivalent production and determine the cost per kg. of Chemical 'G' in Process I using the weighted average cost method.
- (b) Prepare a statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in progress.
- (c) STG is considering the option to sell 60,000 kg. of Chemical 'G' of Process I without processing it further in Process-II. Will it be beneficial for the company over the current pattern of processing 60,000 kg in process-II?

**(10 Marks)**

**Question 4 (b)**

UV Limited started a manufacturing unit from 1<sup>st</sup> October 2021. It produces designer lamps and sells its lamps at ₹450 per unit.

During the quarter ending on 31<sup>st</sup> December, 2021, it produced and sold 12,000 units and suffered a loss of ₹35 per unit.

During the quarter ending on 31<sup>st</sup> March, 2022, it produced and sold 30,000 units and earned a profit of ₹40 per unit.

You are required to calculate:

- (a) Total fixed cost incurred by UV ltd. per quarter.
- (b) Break Even sales value (in rupees)
- (c) Calculate Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30<sup>th</sup> June, 2022).

**(5 Marks)**

**Question 4 (c)**

Journalize the following transactions assuming the cost and financial accounts are integrated:

Particulars	(in ₹)
Direct Materials issued to production	5,88,000
Allocation of Wages (Indirect)	7,50,000
Factory Overheads (Over absorbed)	2,25,000
Administrative Overheads (Under absorbed)	1,55,000
Deficiency found in stock of Raw material (Normal)	2,00,000

**(5 Marks)**

**Question 5 (a)**

Star Limited manufacture three products using the same production methods. A conventional product costing system is being used currently. Details of the three products for a typical period are:

Particulars	AX	BX	CX
Direct Labour hours per unit	1.00	0.90	1.50
Machine hours per unit	2.00	1.50	2.50
Direct Material per unit (₹)	35	25	45
Volume (units)	7,500	12,500	25,000

Direct Labour costs ₹20 per hour and production overheads are absorbed on a machine hour basis. The overhead absorption rate for the period is ₹30 per machine hour.

Management is considering using Activity Based Costing system to ascertain the cost of the products. Further analysis shows that the total production overheads can be divided as follows:

Cost relating to set up	40%
Cost relating to machinery	10%
Cost relating to material handling	30%
Cost relating to Inspection	20%

The following activity volumes are associated with the product line for the period as a whole. Total activities for the period:

Particulars	AX	BX	CX	Total
Number of set-ups	350	450	740	1,540
Number of movement of Materials	200	280	675	1,155
Number of inspections	200	400	900	1,500

Required:

1. Calculate the cost per unit of each product using the conventional method.
2. Calculate the cost per unit of each product using activity based costing method.

(10 Marks)

**Question 5 (b)**

A manufacturing department of a company has employed 120 workers. The standard output of product "NPX" is 20 units per hour and the standard wage rate is ₹25 per labour hour.

In a 48 hours week, the department produced 1,000 units of 'NPX' despite 5% of the time paid being lost due to an abnormal reason. The hourly wages actually paid were ₹25.70 per hour.

Calculate:

- (a) Labour Cost Variance
- (b) Labour Rate Variance
- (c) Labour Efficiency Variance
- (d) Labour Idle time Variance

(5 Marks)

**Question 5 (c)**

RST Limited produces three joint products X, Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for the month of April, 2022.

Cost incurred up to separation point: ₹10,000

	Product X	Product Y	Product Z
Output (in Litre)	100	70	80
Cost incurred after separation point	2,000	1,200	800
Selling Price per Litre:			
After further processing	50	80	60
At pre-separation point (estimated)	25	70	45

You are required to:

- (a) Prepare a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.
- (b) Advise the management whether, on purely financial consideration, the three products are to be processed further or not.

(5 Marks)

**Question 6 (a)**

Briefly explain the essential features of a good Cost Accounting System.

**(5 Marks)**

**Question 6 (b)**

Write down the treatment of following items associated with purchase of materials.

- (a) Cash discount
- (b) IGST
- (c) Demurrage
- (d) Shortage
- (e) Basic Custom Duty

**(5 Marks)**

**Question 6 (c)**

Explain the treatment of Overtime Premium in following situations:

- (a) SV & Co. wants to grab some special orders, and overtime is required to meet the same.
- (b) Dept. X has to work overtime to make up a shortfall in production due to some fault of management in dept. Y.
- (c) S Ltd. has to work overtime regularly throughout the year as a policy due to the workers' shortage.
- (d) Due to flood in Odisha, RS Ltd. has to work overtime to complete the job.
- (e) A customer requested the company MN Ltd. to expedite the job because of his urgency of work.

**(5 Marks)**

**Question 6 (d)**

Identify the methods of costing from the following statements:

- (a) Costs are directly charged to a group of products.
- (b) Nature of the product is complex and method cannot be ascertained.
- (c) Costs ascertained for a single product.
- (d) All costs are directly charged to a specific job.
- (e) Costs are charged to operations and averaged over units produced.

**(5 Marks)**

**SOLUTION FULL TEST 1****Solution 1 (a)**

(a)	EOQ	=	$\sqrt{\frac{2AO}{C}}$	=	$\sqrt{\frac{2 \times 12,000 \times 750}{18}}$	=	1,000 kgs	
	A	=	Annual usage of raw Material (1 unit of raw material gives 5 units of Finished Goods. Therefore, for 60,000 units of finished goods, material required)					
		=	$60,000 \div 5$	=		=	12,000 Kgs	
	O	=	Ordering cost per order					
		=	handling cost per order + freight per order					
		=	$\text{₹}400 + \text{₹}350$	=		=	₹750	
	C	=	Carrying cost or holding cost of inventory per unit p.a.					
		=	Carrying cost per unit p.a. + interest cost of investment in inventory per unit p.a.					
		=	$(\text{₹}0.25 \text{ per unit per month} \times 12 \text{ months}) + \text{₹}15 \text{ per kg p.a.}$					
		=	$\text{₹}3 + \text{₹}15$	=		=	₹18 per kg p.a.	

(b) Frequency of placing order:

		=	$\frac{360 \text{ days}}{\text{* No. of orders}}$	=	$\frac{360 \text{ days}}{12 \text{ orders}}$	=	30 days
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*No. of orders	=	$\frac{\text{Annual requirement}}{\text{EOQ}}$	=	$\frac{12,000 \text{ kgs}}{1,000 \text{ kgs}}$	=	12 orders
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(c) Total Ordering and Carrying cost per annum at EOQ:

Total cost of ordering	=	Number of orders $\times$ Cost per order			
	=	$12 \times \text{₹}750$	=		₹9,000
Total cost of carrying	=	$\frac{1}{2} \text{EOQ} \times C$			
	=	$\frac{1}{2} \times 1,000 \text{ Kg.} \times \text{₹}18$	=		₹9,000
Total Cost	=	₹18,000			

**Solution 1 (b)**

(a) Average number of workers:

Number of workers replaced	=	8% of Average workers	=	72 workers
$\therefore$ Average workers	=	$72 \div 8\%$	=	900 Workers

(b) Number of workers left and discharged:

No. of workers left & discharged	=	5% of Average workers		
	=	5% of 900	=	45 Workers

(c) Number of workers recruited and joined:

No. of workers recruited & joined	=	Flux - Separation	=	16% - 5%
	=	11% of 900	=	99 Workers

(d) Equivalent turnover rates for the year:

Equivalent turnover rate	=	Turnover for quarter $\times$ 4 quarters		
Using Flux Method	=	$16\% \times 4$	=	64%
Using Replacement Method	=	$8\% \times 4$	=	32%

Using Separations Method =  $5\% \times 4$  = 20%

**Solution 1 (c)**

1. Profit (Machine A) = Contribution – Fixed cost  
 = 8,00,000 units × ₹160 (₹400 - ₹240) – ₹3,50,00,000  
 = ₹9,30,00,000

Profit (Machine B) = Contribution – Fixed cost  
 = 10,00,000 units × ₹140 (₹400 - ₹260) – ₹2,00,00,000  
 = ₹12,00,00,000

Recommendation: Machine B should be chosen as it gives more profit.

2. Profit (Machine A) = Contribution – Fixed cost  
 = 12,00,000 units × ₹160 (₹400 - ₹240) – ₹3,50,00,000  
 = ₹15,70,00,000

Profit (Machine B) = Contribution – Fixed cost  
 = 12,00,000 units × ₹140 (₹400 - ₹260) – ₹2,00,00,000  
 = ₹14,80,00,000

Yes, the preference for the machine would change because now, Machine A is having higher contribution and higher profit, hence recommended.

**Solution 1 (d)**

Statement Showing Cost per Tonne-Km

Particulars	Mine X	Mine Y
Drivers wages, license, insurance, depreciation, garage rent and taxes @ ₹12 per hour	(12.00 × 90/60) 18.00	(12.00 × 100/60) 20.00
Fuel, oil, tyres, repairs and maintenance @ ₹1.60 per Km	(1.60 × 30 kms) 48.00	(1.60 × 40 kms) 64.00
Operating Cost	66.00	84.00
÷ Effective tonne-kms	÷ 60	÷ 80
Cost per tonne-km	₹1.10	₹1.05

Working Notes:

(1) Total operating time in 1 trip:	Mine X	Mine Y
Running time (to & fro)	$\frac{60}{40} \times 30$ Kms 45 minutes	$\frac{60}{40} \times 40$ Kms 60 minutes
Unloading time	15 minutes	15 minutes
Loading time	30 minutes	25 minutes
Total operating time in one trip	90 minutes	100 minutes
(2) Effective tonnes km per trip:	4 tonnes × 15 kms + Nil tonnes × 15 kms = 60 tonne kms	4 tonnes × 20 kms + Nil tonnes × 20 kms = 80 tonne kms

**Solution 2 (a)**

(a) Computation of percentage recovery rates of factory overheads and administration overheads:

Let % of factory overheads to direct wages be F and % of administrative overheads to factory cost be A

Jobs Cost Sheet

Particulars	Job 1	Job 2
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Direct materials	1,08,000	75,000
Direct wages	84,000	60,000
Prime cost	1,92,000	1,35,000
Factory overheads	84,000F	60,000F
Factory cost	1,92,000+84,000F	1,35,000+60,000F
Administration overheads	(1,92,000+84,000F)A	(1,35,000+60,000F)A
Total cost	(1,92,000+84,000F)+ (1,92,000+84,000F)A = 2,97,600	(1,35,000+60,000F)+ (1,35,000+60,000F)A = 2,10,000

\* Computation of total cost of jobs:

Total cost of Job 1 when 12% is the profit on cost	=	$\frac{3,33,312}{112\%}$	=	₹2,97,600
Total cost of Job 2 when 20% is the profit on cost	=	$\frac{2,52,000}{120\%}$	=	₹2,10,000

Now, we have the following equations:

$$1,92,000 + 84,000 F + 1,92,000A + 84,000 FA = 2,97,600 \quad (1)$$

$$1,35,000 + 60,000F + 1,35,000A + 60,000FA = 2,10,000 \quad (2)$$

Multiply equation (1) by 5 and equation (2) by 7

$$9,60,000 + 4,20,000 F + 9,60,000A + 4,20,000 FA = 14,88,000 \quad (3)$$

$$9,45,000 + 4,20,000F + 9,45,000A + 4,20,000FA = 14,70,000 \quad (4)$$

By subtracting equation (4) from (3):

$$15,000 + 15,000 A = 18,000$$

$$15,000A = 3,000$$

$$A = 0.2 \text{ or } 20\%$$

Now putting the value of A in equation (1) to find the value of F:

$$1,92,000 + 84,000F + 1,92,000 \times 0.2 + (84,000F \times .2 = 2,97,600$$

$$84,000 F + 16,800 F = 67,200$$

$$F = 0.6667 \text{ or } 66.67\%$$

(b) Statement Showing Amount of Factory Overheads, Administrative Overheads and Profit

Particulars	Job 1	Job 2
Direct materials	1,08,000	75,000
Direct wages	84,000	60,000
Prime cost	1,92,000	1,35,000
Factory overheads (66.67% of wages)	56,000	40,000
Factory cost	2,48,000	1,75,000
Administration overheads (20% of factory cost)	49,600	35,000
Total cost	2,97,600	2,10,000
Profit	35,712	42,000
Selling Price	3,33,312	2,52,000

(b) Selling Price of the Job 3

Particulars	Amount
Materials	68,750
Productive Wages	22,500
Prime Cost	91,250

Factory Overheads (66.67% of 22,500)	15,000
Factory Cost	1,06,250
Admin Overheads (20% of 1,06,250)	21,250
Total Cost	1,27,500
Profit	22,500
Sale Price (1,27,500 ÷ 85%)	1,50,000

**Solution 2 (b)**

$$(a) \quad \text{Break even sales} = \frac{\text{Fixed cost}}{\text{PV Ratio}} = \frac{12,60,000}{30\%} = ₹42,00,000$$

$$(b) \quad \text{Total sales at present} = \frac{\text{BEP Sales}}{\text{BEP as \% of Total Sales}} = \frac{42,00,000}{75\%} \\ = ₹56,00,000$$

$$(c) \quad \text{Proposed Sales} = \frac{\text{Revised Fixed cost} + \text{Desired Profit}}{\text{PV Ratio}} \\ = \frac{(12,60,000 - 10\%) + 4,20,000}{30\%} = ₹51,80,000$$

$$(d) \quad \text{Desired Sales Value} = \frac{\text{Fixed cost}}{\text{PV ratio} - \% \text{ of Profit to Sales}} = \frac{12,60,000}{30\% - 20\%} \\ = ₹1,26,00,000$$

$$(e) \quad \text{New Margin of Safety} = \text{Revised Sales} - \text{BEP Sales} \\ = (56,00,000 - 12.5\%) - 42,00,000 = ₹7,00,000$$

WN:

$$\text{Existing Profit} = \text{MOS} \times \text{PV Ratio} = ₹56,00,000 \times 25\% \times 30\% \\ = ₹4,20,000$$

**Solution 2 (c)**

$$(a) \quad \text{Earning under Existing Time Rate} = (48 \text{ hours} \times ₹150) + (12 \text{ hours} \times ₹300) \\ = ₹10,800$$

$$(b) \quad \text{Earning under Rowan Plan} = (\text{AH} \times \text{R}) + \frac{\text{AH}}{\text{SH}} \times (\text{SH} - \text{AH}) \times \text{R} \\ = (48 \times ₹150) + \frac{48}{75} \times (75 - 48) \times ₹150 \\ = ₹9,792$$

$$(c) \quad \text{Earning under Halsey Plan} = (\text{AH} \times \text{R}) + 50\% (\text{SH} - \text{AH}) \times \text{R} \\ = (48 \times ₹150) + 50\% (75 - 48) \times ₹150 \\ = ₹9,225$$

Working Notes:

$$\text{Standard hours for 100 units} = \frac{7.5 \text{ hours}}{10 \text{ units}} \times 100 \text{ units} = 75 \text{ hours}$$

**Solution 3 (a)**

(1) Calculation of the number of shirts and shorts to be produced per month:

(a) Contribution per labour hour:

Particulars	Shirt (₹)	Short (₹)
Sales price per unit	60	44
Less: Variable cost per unit:		
Raw materials (24 ÷ 6) & (12 ÷ 4)	30	16
Direct labour	8	4
Contribution per unit	22	24
÷ Labour hour per unit (8 ÷ 8) & (4 ÷ 8)	÷1	÷0.5
Contribution per labour hour	22	48

(b) Production plan for the first three months:

Since, Shorts has the higher Contribution per labour hour, it will be made first. Shirts will be 25% of Shorts.

Let the Quantity of Shorts be X and Shirts will be 0.25 X, then

$$\begin{aligned}
 (\text{Qty. of Shorts} \times \text{labour hour p.u.}) + (\text{Qty. of Shirts} \times \text{labour hour p.u.}) &= \text{Total labour hours} \\
 (X \times 0.5 \text{ hour}) + (0.25X \times 1 \text{ hour}) &= 12,000 \text{ hours} \\
 0.5X + 0.25X &= 12,000 \\
 X &= 12,000 \div 0.75 = 16,000 \text{ units of Shorts} \\
 \text{Therefore, for Shirts} &= 25\% \text{ of } 16,000 \text{ units} = 4,000 \text{ units}
 \end{aligned}$$

Production per month for the first quarter will be Shorts 16,000 units & Shirts 4,000 units.

(2) (a) Sales Budget for the month of July, August & September 2022

Particulars	July 2022		August 2022		September 2022	
	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
Sales demand (units)	15,000	20,000	16,500	22,000	18,150	24,200
Selling price per unit	60	44	60	44	60	44
Sales Revenue (₹)	9,00,000	8,80,000	9,90,000	9,68,000	10,89,000	10,64,800

(2) (b) Production budget for the month of July, August & September 2022

Particulars	July 2022		August 2022		September 2022	
	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
Sales demand (units)	15,000	20,000	16,500	22,000	18,150	24,200
Add: Closing stock (40% of next month)	6,600	8,800	7,260	9,680	7,986	10,648
Less: Opening stock	-	-	(6,600)	(8,800)	(7,260)	(9,680)
Production (units)	21,600	28,800	17,160	22,880	18,876	25,168

Working Note: Sales demand for October 2022:

$$\begin{aligned}
 \text{Shirts} &= 18,150 + 10\% = 19,965 \\
 \text{Shorts} &= 24,200 + 10\% = 26,620
 \end{aligned}$$

**Solution 3 (b)**

(1) Cost Sheet

Particulars	Amount
Raw Materials Purchased	2,80,000
Add: Opening stock of Raw Materials	10,000
Less: Closing stock of Raw Materials	(40,000)
Materials Consumed	2,50,000
Add: Direct Wages	70,000
Prime Cost	3,20,000
Add: Factory Overheads:	
Depreciation on plant	15,000
Lease Rent of Production Assets	10,000

Expenses paid for pollution control and engineering & maintenance	1,000
Factory Cost	
Add: Expenses paid for quality control check activities	3,46,000
Add: Research and Development Cost	4,000
Add: Administration Overheads (Production)	5,000
Add: Primary Packing Cost	15,000
Cost of Production	8,000
Add: Opening Finished Goods	3,78,000
Less: Closing Finished Goods [(3,78,000 ÷ 3,000) × 400]	28,000
Cost of Goods Sold	(50,400)
Add: Administrative Expenses	3,55,600
Add: Packing cost for redistribution of finished goods	1,300
Cost of Sales	1,500
	3,58,400

(2) Selling Price per unit:

Cost per unit	=	3,58,400 ÷ 2,800 units (200 + 3,000 - 400)	=	128
Selling price per unit	=	128 ÷ 80%	=	160

#### Solution 4 (a)

(a) Statement of Equivalent Production (Average Cost Method)

Particulars	Units	Materials		Processing Cost	
		%	Unit	%	Unit
Units Completed	83,000	100	83,000	100	83,000
Normal loss (10% of 10,500)	10,500	-	-	-	-
Closing WIP	16,500	100	16,500	60	9,900
Abnormal Loss (9,500 + 1,05,000 - 83,000 - 16,500 - 10,500)	4,500	100	4,500	100	4,500
Total	1,14,500	-	1,04,000	-	97,400

Statement of Cost per Equivalent Unit

Elements	Total Cost	Equivalent Units	Cost Per Unit
Materials	29,500 + 3,34,500 = 3,64,000	1,04,000	3.50
Processing Cost	14,750 + 2,53,100 = 2,67,850	97,400	2.75
			6.25

(b) Statement Showing Cost of Chemical 'G' transferred to Process II, Cost of Abnormal Loss and Cost of Closing work-in progress

Particulars	Elements	Eq. Units	Cost Per Unit	Total
Units transferred (60,000 units)	All	60,000	6.25	3,75,000
Abnormal Loss	All	4,500	6.25	28,125
Closing WIP	Materials	16,500	3.50	57,750
	Processing Cost	9,900	2.75	27,225
				84,975

(c) Further Processing Decision:

Incremental revenue	Incremental cost	Situation	Decision
(60,000 × 1.2 kgs × ₹10) - (60,000 × ₹9) = ₹1,80,000	₹85,000 + ₹50,000 = ₹1,35,000	IR > IC	Yes

Advise: Additional net profit on further processing in Process II is 45,000 (1,80,000 - 1,35,000). Therefore, it is advisable to process further chemical 'G'.

**Solution 4 (b)**(a) Fixed Cost per quarter (by using data of quarter ending 31<sup>st</sup> March, 2022):

$$\begin{aligned} \text{Fixed cost} &= \text{Contribution} - \text{profit} \\ &= 30,000 \text{ units} \times 450 \times 20\% - 30,000 \times 40 = ₹15,00,000 \end{aligned}$$

(b) Calculation of Break Even Point:

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{15,00,000}{20\%} = ₹75,00,000$$

(c) Calculation of profit at 50,000 units:

$$\begin{aligned} \text{Profit} &= \text{Contribution} - \text{Fixed cost} \\ &= 50,000 \times 450 \times 20\% - 15,00,000 = ₹30,00,000 \end{aligned}$$

Working Notes:

$$\text{PV Ratio} = \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{30,000 \times 40 + 12,000 \times 35}{(30,000 - 12,000) \times 450} = 20\%$$

**Solution 4 (c)**

## Journal Entries

S. No.	Entries	Dr.	Cr.
(a)	Work-in-progress Ledger Control A/c To Store Ledger Control A/c (Being issue of direct materials to production)	Dr. 5,88,000 -	- 5,88,000
(b)	Factory Overhead Control A/c To Wages Control A/c (Being allocation of indirect wages)	Dr. 7,50,000 -	- 7,50,000
(c)	Factory Overhead Control A/c To Costing Profit & Loss A/c (Being transfer of over absorption of factory overhead)	Dr. 2,25,000 -	- 2,25,000
(d)	Costing Profit & Loss A/c To Administration Overhead Control A/c (Being transfer of under absorption of administration overhead)	Dr. 1,55,000 -	- 1,55,000
(e)	Factory Overhead Control A/c To Store Ledger Control A/c (Being transfer of deficiency in stock of raw material)	Dr. 2,00,000 -	- 2,00,000

**Solution 5 (a)**

1. Statement Showing "Cost per unit as per Conventional Method"

Particulars	AX (₹)	BX (₹)	CX (₹)
Direct Materials	35	25	45
Direct Labour [(1, 0.9, 1.5 hours) × ₹20]	20	18	30
Production Overheads [(2, 1.5, 2.5 hours) × ₹30]	60	45	75
Cost per unit	115	88	150

2. Statement Showing "Cost per unit as per ABC Method"

Particulars	AX (₹)	BX (₹)	CX (₹)
Production (units)	7,500	12,500	25,000
Direct Materials @ ₹35/₹25/₹45 per unit	2,62,500	3,12,500	11,25,000
Direct Labour @ ₹20/₹18/₹30 per unit	1,50,000	2,25,000	7,50,000
Production Overhead: Setup Costs @ ₹750 per setup	2,62,500	3,37,500	5,55,000

Machine Related Costs @ ₹3 per hour	(750 × 350) 45,000	(750 × 450) 56,250	(750 × 740) 1,87,500
Material Handling Cost @ ₹750 per movement	(3 × 15,000) 1,50,000	(3 × 18,750) 2,10,000	(3 × 62,500) 5,06,250
Inspection Costs @ ₹385 per inspection	(750 × 200) 77,000	(750 × 280) 1,54,000	(750 × 675) 3,46,500
	(385 × 200) 77,000	(385 × 400) 1,54,000	(385 × 900) 3,46,500
Total Costs	9,47,000	12,95,250	34,70,250
Cost per unit (Total Cost ÷ Units)	126.267	103.62	138.81

Working Notes:

(a) Total Machine Hours =  $7,500 \times 2 + 12,500 \times 1.5 + 25,000 \times 2.5 = 96,250$  hours

(b) Total Production OH =  $96,250$  machine hours  $\times$  ₹30 = ₹28,87,500

(c) Statement Showing Cost Driver Rate:

Cost Pool	%	Overheads	Cost Driver Basis	Volume	Cost Driver Rate
Set-up	40%	11,55,000	No of set ups	1,540	750/Setup
Machine related cost	10%	2,88,750	No of Machine Hours	96,250	3/Machine Hour
Material handling	30%	8,66,250	No of Material movements	1,155	750/Movement
Inspection	20%	5,77,500	No of inspections	1,500	385/Inspection
Total	-	28,87,500	-	-	-

### Solution 5 (b)

- Labour Cost Variance =  $(SH \times SR) - (AH \times AR)$   
= ₹1,50,000 - ₹1,48,032 = ₹1,968 F
- Labour Rate Variance =  $(AH \times SR) - (AH \times AR)$   
= ₹1,44,000 - ₹1,48,032 = ₹4,032 A
- Labour Efficiency Variance =  $(SH \times SR) - (AHW \times SR)$   
= ₹1,50,000 - ₹1,36,800 = ₹13,200 F
- Labour Idle Variance =  $(AHW \times SR) - (AH \times SR)$   
= ₹1,36,800 - ₹1,44,000 = ₹7,200 A

Working notes:

#### 2. Basic Calculation

SH × SR	AHW × SR	AH × SR	AH × AR
1,000 units × 6 hours × ₹25	120 workers × 45.6 hours (48 - 5%) × ₹25	120 workers × 48 hours × ₹25	120 workers × 48 hours × ₹25.70
₹1,50,000	₹1,36,800	₹1,44,000	₹1,48,032

2. Standard hour per unit =  $(120 \text{ workers} \times 1 \text{ hour}) \div 20 \text{ units} = 6 \text{ hours per unit}$

### Solution 5 (c)

(a) Statement Showing Profit or Loss made by each Product after Further Processing

Particulars	Product X	Product Y	Product Z
Output in units	100	70	80
Sales after further processing (₹)	5,000	5,600	4,800
Less: Further processing cost (₹)	(2,000)	(1,200)	(800)
Less: Joint cost (₹10,000 in proportion of 100:70:80)	(4,000)	(2,800)	(3,200)
Profit/(Loss) (₹)	(1,000)	1,600	800

(b) Further Processing Decision

Products	Incremental revenue	Incremental cost	Situation	Decision
X	100 (₹50 - ₹25) = ₹2,500	₹2,000	IR > IC	Yes
Y	70 (₹80 - ₹70) = ₹700	₹1,200	IR < IC	No
Z	80 (₹60 - ₹45) = ₹1,200	₹800	IR > IC	Yes

Advise: It is advisable to further process only product X and Z and to sale product Y at the point of separation.

### **Solution 6 (a)**

The essential features, which a good cost accounting system should possess, are as follows:

(a) Informative and simple: Cost accounting system should be tailor-made, practical, simple and capable of meeting the requirements of a business concern. The system of costing should not sacrifice the utility by introducing inaccurate and unnecessary details.

(b) Accurate and authentic: The data to be used by the cost accounting system should be accurate and authenticated; otherwise it may distort the output of the system and a wrong decision may be taken.

(c) Uniformity and consistency: There should be uniformity and consistency in classification, treatment and reporting of cost data and related information. This is required for benchmarking and comparability of the results of the system for both horizontal and vertical analysis.

(d) Integrated and inclusive: The cost accounting system should be integrated with other systems like financial accounting, taxation, statistics and operational research etc. to have a complete overview and clarity in results.

(e) Flexible and adaptive: The cost accounting system should be flexible enough to make necessary amendment and modifications in the system to incorporate changes in technological, reporting, regulatory and other requirements.

(f) Trust on the system: Management should have trust on the system and its output. For this, an active role of management is required for the development of such a system that reflects a strong conviction in using information for decision making.

### **Solution 6 (b)**

(a) Cash Discount: Cash discount is not deducted from the purchase price. It is treated as interest and finance charges. It is ignored.

(b) IGST: Integrated Goods and Service Tax (IGST) is paid on inter-state supply of goods and provision of services and collected from the buyers. It is excluded from the cost of purchase if credit for the same is available. Unless mentioned specifically it should not form part of cost of purchase.

(c) Demurrage: Demurrage is a penalty imposed by the transporter for delay in unloading or offloading of materials. It is an abnormal cost and not included with cost of purchase

(d) Shortage due to normal reasons: Good units absorb the cost of shortage due to normal reasons. Losses due to breaking of bulk, evaporation, or due to any unavoidable conditions etc. are the reasons of normal loss.

Shortage due to abnormal reasons: Shortage arises due to abnormal reasons such as material mishandling, pilferage, or due to any avoidable reasons are not absorbed by the good units. Losses due to abnormal reasons are debited to costing profit and loss account.

(e) Basic Custom Duty: Basic Custom duty is paid on import of goods from outside India. It is added with the purchase cost.

### **Solution 6 (c)**

(a) If overtime is required to cope with general production programmes or for meeting urgent orders, the overtime premium should be treated as overhead cost of the particular department or cost centre which works overtime.

(b) If overtime is worked in a department due to the fault of another department, the overtime premium should be charged to the latter department (Y).

- (c) The overtime premium is treated as a part of employee cost and job is charged at an effective average wage rate.
- (d) Overtime worked on account of abnormal conditions such as flood, earthquake etc., should not be charged to cost, but to Costing Profit and Loss Account.
- (e) Where overtime is worked at the request of the customer, overtime premium is also charged to the job/customer directly.

***Solution 6 (d)***

- (a) Batch costing
- (b) Multiple costing
- (c) Unit/ Single/Output costing
- (d) Job costing
- (e) Process costing

**100 MARKS FULL TEST 2**

Question No. 1 is compulsory.  
Answer any **four** questions out of the remaining **five** questions.  
Working notes should form part of the answer.

**Question 1 (a)**

A Ltd. is a pharmaceutical company which produces vaccines for diseases like Monkey Pox, Covid-19 and Chickenpox. A distributor has given an order for 1,600 Monkey pox vaccines. The company can produce 80 vaccines at a time. To process a batch of 80 Monkey Pox vaccines, the following costs would be incurred:

Direct materials	₹4,250
Direct wages	₹500
Lab set-up cost	₹1,400

The production overheads are absorbed at a rate of 20% of direct wages and 20% of total production cost is charged in each batch for selling, distribution and administration overheads. The company is willing to earn profit of 25% on sales value.

You are required to determine:

- Total sales value for 1,600 Monkey Pox vaccines
- Selling price per unit of vaccine.

**(5 Marks)****Question 1 (b)**

ABC Bank is having a branch which is engaged in processing of 'Vehicle Loan' and 'Education Loan' applications in addition to other services to customers. 30% of the overhead costs of the branch are estimated to be applicable to the processing of 'Vehicle Loan' applications and 'Education Loan' applications each.

Branch is having four employees at a monthly salary of ₹50,000 each, exclusively for processing of Vehicle loan applications and two employees at a monthly salary of ₹70,000 each, exclusively for processing of Education Loan applications.

In addition to above, following expenses are incurred by the Branch:

- Branch Manager who supervises all the activities of branch, is paid at ₹90,000 per month.
- Legal charges, Printing & stationery and Advertising Expenses are incurred at ₹30,000, ₹12,000 and ₹18,000 respectively for a month,
- Other Expenses are ₹10,000 per month.

You are required to:

- Compute the cost of processing a Vehicle Loan Application on the assumption that 496 Vehicle Loan applications are processes each month.
- Find out the number of Education Loan Applications processes, if the total processing cost per Education Loan Application is same as in the Vehicle Loan Application as computed in (a) above.

**(5 Marks)****Question 1 (c)**

MM Ltd. uses 7,500 valves per month which is purchased at a price of ₹1.50 per unit, the carrying cost is estimated to be 20% of average inventory investment on an annual basis. The cost to place an order and getting the delivery is ₹15. It takes a period of 1.5 months to receive a delivery from the date of placing and order and a safety stock of 3,200 valves is desired.

You are required to determine:

- The Economics Order Quantity (EOQ) and the frequency of orders
- The re-order point.
- The Economics Order Quantity (EOQ) if the valve costs ₹4.50 each instead of ₹1.50 each.  
(Assume a year consists of 360 days)

**(5 Marks)**

**Question 1 (d)**

ABC Ltd, sell its Product 'Y' at a price of ₹300 per unit and its variable cost is ₹180 per unit. The fixed costs are ₹16,80,000 per year uniformly incurred throughout the year, The Profit for the year is ₹7,20,000.

You are required to calculate:

- BEP in value (₹) and units.
- Margin of Safety
- Profits made when sales are 24,000 units,
- Sales in value (₹) to be made to earn a net profit of ₹10,00,000 for the year.

**(5 Marks)****Question 2 (a)**

USP Ltd. is the manufacture of 'double grip motorcycle tyres. In the manufacturing process, it undertakes three different job namely, Vulcanising, Brushing and Striping. All of these jobs requires the use of a special machine and also the aid of a robot when necessary. The robot is hired from outside and the hire charges paid for every six month is ₹2,70,000, An estimated of overhead expenses relating to the special machine is given below:

- Rent for a quarter is ₹18,000
- The cost of the special machine is ₹19,20,000 and depreciation is charged @ 10% per annum on straight line basis.
- Other indirect expenses are recovered at 20% of direct wages.

The factory manager has informed that in the coming year, the total direct wages will be ₹12,00,000 which will be incurred evenly throughout the year. During the first month of operation, the following details are available from the job book:

Number of hours the special machine was used

Jobs	Without the aid of the robot	With the aid of the robot
Vulcanising	500	400
Brushing	1,000	400
Striping	-	1,200

You are required to:

- Compute the Machine Hour Rate for the company as a whole for a month (A) when the robot is used and (B) when the robot is not used.
- Compute the Machine Hour Rate for the individual jobs i.e. Vulcanising, Brushing and Striping.

**(10 Marks)****Question 2 (b)**

A skilled worker, in PK Ltd., is paid a guaranteed wage rate of ₹15.00 per hour in a 48 hour week. The standard time to produce a unit is 18 minutes. During a week, a skilled worker- Mr. 'A' has produced 200 units of the product. The company has taken a drive for cost reduction and wants to reduce its labour cost.

You are required to:

- Calculate wages of Mr. 'A' under each of the following methods :
  - Time rate,
  - Piece-rate with a guaranteed weekly wage,
  - Halsey Premium Plan
  - Rowan Premium Plan
- Suggest which bonus plan i.e. Halsey Premium Plan or Rowan Premium Plan, the company should follow.

**(6 Marks)****Question 2 (c)**

XYZ Ltd. is engaged in manufacturing two products- Express Coffee and Instant Coffee. It furnishes the following data for a year:

Products	Actual Output	Total Machine	Total Number of	Total Number of
----------	---------------	---------------	-----------------	-----------------

	(units)	Hours	Purchase	set ups
Express Coffee	5,000	20,000	160	20
Instant Coffee	60,000	1,20,000	384	44

The annual overheads are as under:

Particulars	Amount
Machine Processing costs	7,00,000
Set up related costs	7,68,000
Purchase related costs	6,80,000

You are required to:

- Compute the costs allocated to each product – Express Coffee and Instant Coffee from each activity on the basis of Activity – Based Costing (ABC) method.
- Find out the Overhead cost per units of each product – Express coffee and instant coffee based on (a) above.

**(4 Marks)**

**Question 3 (a)**

RST Toll Plaza Limited built a 80 kilometer long highway between two cities and operates a toll plaza to collect tolls from passing vehicles using the highway. The company has estimated that 50,000 light weight, 12,000 medium weight and 10,000 heavy weight vehicles will be using the highway in one month in outward journey and the same number for return journey.

As per government notification, vehicles used for medical emergencies, members of parliament, and essential services are exempt from toll charges. It is estimated that 10% of light weight vehicles will pass the highway for such use.

It is the policy of the company that if vehicles return within 24 hours of their outward journey. The toll fare will be reduced by 25 percent automatically. It is estimated 30% of chargeable light weight vehicles return within the specified time frame.

The toll charges for medium weight vehicles is to be fixed as 2.5 times of the light weight vehicles and that of heavy weight vehicles as 2 times of the medium weight vehicles.

The toll operating and maintenance cost for a month is ₹59,09,090. The company requires a profit of 10% over the total cost to cover interest and other costs.

Required:

- Calculate the toll rate for each type of vehicles if concession facilities are not available on the return journey.
- Calculate the toll rate that will be charged from light weight vehicles if a return journey concession facility is available, assuming that the revenue earned from light weight vehicles calculate in option (a) remains the same.

**(10 Marks)**

**Question 3 (b)**

N Ltd. produces a product which passes through two processes – Process-I and Process-II. The company has provided following information related to the Financial Year 2021-22.

Particulars	Process-I	Process-II
Raw Material @ ₹65 per unit	6,500 units	-
Direct Wages	₹1,40,000	₹1,30,000
Direct Expenses	30% of Direct wages	35% of Direct wages
Manufacturing Overheads	₹21,500	₹24,500
Realisable value of scrap per unit	₹4.00	₹16.00
Normal Loss	250 units	500 units
Units transferred to Process II / finished stock	6,000 units	5,500 units
Sales	-	5,000 units

There was no opening or closing stock of work-in-progress.

You are required to prepare:

- Process-I Account
- Process-II Account
- Finished Stock Account

(10 Marks)

**Question 4 (a)**

An agriculture based company having 210 hectares of land is engaged in growing three different cereals namely, wheat, rice, and maize annually. The yield of the different crops and their selling prices are given below:

Particulars	Wheat	Rice	Maize
Yield (in kgs per hectare)	2,000	500	100
Selling price (₹ per kg)	20	40	250

The variable cost data of different crops are given below:

(All figures in ₹ per kg)

Particulars	Wheat	Rice	Maize
Labour charges	8	10	120
Packing materials	2	2	10
Other variable expenses	4	1	20

The company has a policy to produce and sell all the three kinds of crops. The maximum and minimum area to be cultivated for each crop is as follows:

Particulars	Wheat	Rice	Maize
Maximum area in hectares	160	50	60
Minimum area in hectares	100	40	10

You are required to:

- Rank the crops on the basis of contribution per hectare.
- Determine the optimum product mix considering that all the three cereals are to be produced.
- Calculate the maximum profit which can be achieved if the total fixed cost per annum is ₹21,45,000. (Assume that there are no other constraints applicable to this company)

(10 Marks)

**Question 4 (b)**

PNME Ltd. manufactures two types of masks- 'Disposable Masks' and 'Cloth Masks'. The cost data for the year ended 31<sup>st</sup> March, 2022 is as follows:

Direct Materials	₹12,50,000
Direct Wages	₹7,00,000
Production Overheads	₹4,00,000
Total	₹23,50,000

It is further ascertained that:

- Direct materials cost per unit of Cloth Mask was twice as much of Direct materials cost per unit of Disposable Mask.
- Direct wages per unit for Disposable Mask were 60% of those for Cloth Mask.
- Production overhead per unit was at same rate for both the types of the masks.
- Administration overhead was 50% of Production overhead for each type of mask.
- Selling cost was ₹ 2 per Cloth Mask.
- Selling Price was ₹ 35 per unit Cloth Mask.
- No. of units of Cloth Masks sold - 45,000
- No. of units of Production of Cloth Masks : 50,000

Disposable Masks : 1,50,000

You are required to prepare a cost sheet for Cloth Masks showing:

- (a) Cost per unit and Total cost,  
 (b) Profit per unit and Total Profit.

(10 Marks)

**Question 5 (a)**

Y Ltd. manufactures "Product M" which requires three types of raw materials - "A", "B" & "C". Following information related to 1<sup>st</sup> quarter of the F.Y. 2022-23 has been collected from its books of accounts. The standard material input required for 1,000 kg of finished product 'M' are as under:

Material	Quantity (Kg.)	Std. Rate per Kg. (₹)
A	500	25
B	350	45
C	250	55
	1,100	
Less: Standard Loss	100	
Standard Output	1,000	

During the period the company produced 20,000 kgs of product 'M' for which the actual quantity of materials consumed and purchase prices are as under:

Material	Quantity (Kg.)	Purchase price per kg. (₹)
A	11,000	23
B	7,500	48
C	4,500	60

You are required to calculate:

- (a) Material Cost Variance  
 (b) Material Price Variance for each raw material and Product 'M'  
 (c) Material Usage Variance for each raw material and product 'M'  
 (d) Material Yield Variance

Note: Indicate the nature of variance i.e. Favourable or Adverse.

(10 Marks)

**Question 5 (b)**

'X' Ltd. follows Non-Integrated Accounting System. Financial Accounts of the company show a Net Profit of ₹5,50,000 For the year ended 31<sup>st</sup> March, 2022. The chief accountant of the company has provided following information from the Financial Accounts and Cost Accounts :

SN.	Particulars	(₹)
(i)	Legal Charges provided in financial accounts	15,250
(ii)	Interim Dividend received credited in financial accounts	4,50,000
(iii)	Preliminary Expenses written off in financial accounts	25,750
(iv)	Over recovery of selling overheads in cost accounts	11,380
(v)	Profit on sale of capital asset credited in financial accounts	30,000
(vi)	Under valuation of closing stock in cost accounts	25,000
(vii)	Over recovery of production overheads in cost accounts	10,200
(viii)	Interest paid on Debentures shown in financial accounts	50,000

Find out the Profit (Loss) as per Cost Accounts by preparing a Reconciliation Statement.

(5 Marks)

**Question 5 (c)**

ASR Ltd mainly produces Product 'L' and gets a by-Product 'M' out of a joint process. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main

product. During the month of October 2022, company incurred joint production costs of ₹4,00,000. The main Product 'L' is not marketable at the split off point. Thus, it has to be processed further. Details of company's operation are as under:

Particulars	Product L	By- Product M
Production (units)	10,000	200
Selling pricing per kg	₹45	₹5
Further Processing cost	₹1,01,000	-

You are required to find out:

- Profit earned from Product 'L'
- Selling price per kg of product 'L', if the company wishes to earn a profit of ₹1,00,000 from the above production.

(5 Marks)

### Question 6 (a)

Indicate, for following items, whether to be shown in the Cost Accounts or Financial Accounts:

- Preliminary Expenses written of during the year
- Interest received on bank deposits
- Dividend, Interest received on investment
- Salary for the proprietor at notional figure though not incurred
- Charges in lieu of rent where premises are owned
- Rent receivables
- Loss on sale of Fixed Assets
- Interest on capital at notional figure though not incurred
- Goodwill written off
- Notional Depreciation on the assets fully depreciated for which book value is Nil.

(5 Marks)

### Question 6 (b)

PP Limited is in the process of implementation of Activity Based Costing System in the organization, for this purpose, it has identified the following Business Functions in its organization:

- Research and Development
- Design of Products, Services and Procedures
- Customer Service
- Marketing
- Distribution

You are required to specify two cost drives for each Business Function Identified above.

(5 Marks)

### Question 6 (c)

Define Budget Manual. What are the salient features of Budget Manual?

(5 Marks)

### Question 6 (d)

Mention the cost units (Physical measurement) for the following industry/product:

- Automobile
- Gas
- Brick works
- Power
- Steel
- Transport (by road)
- Chemical
- Oil
- Brewing
- Cement

(5 Marks)

**SOLUTION FULL TEST 2****Solution 1 (a)**

(a) Statement Showing Sales Value of 1,600 Vaccines

Particulars		Amount
Direct materials	(4,250 × 20 batches)	85,000
Direct wages	(500 × 20 batches)	10,000
Lab set-up cost	(1,400 × 20 batches)	28,000
	Prime cost	1,23,000
Add: Production overhead (20% on direct wages)		2,000
	Total Production Cost	1,25,000
Add: S & D and Administration overhead (20% of production Cost)		25,000
	Total Cost	1,50,000
Add : Profit		50,000
	Selling Price (1,50,000 ÷ 75%)	2,00,000

$$\text{No. of batch} = 1,600 \text{ units} \div 80 \text{ units} = 20 \text{ batches}$$

$$(b) \text{ Selling price per vaccine} = 2,00,000 \div 1,600 = ₹125$$

**Solution 1 (b)**

(a) Statement of Cost of Processing One Vehicle Loan Application

Particulars		Amount
Direct labour cost (4 employees × 50,000)		2,00,000
Allocation of branch overhead cost (30% of 1,60,000)		48,000
Total processing cost per month		2,48,000
÷ Number of applications processed per month		÷ 496
	Cost of Processing One Vehicle Loan Application	₹500

(b) Statement Showing Number of Education Loan Application

Particulars		Amount
Direct labour cost (2 employees × 70,000)		1,40,000
Allocation of branch overhead cost (30% of 1,60,000)		48,000
Total processing cost per month		1,88,000
÷ Total processing cost per Education Loan Application		÷ 500
	Number of Education Loan Application	376

Working Notes:

$$\text{Overheads costs of the branch} = 90,000 + 30,000 + 12,000 + 18,000 + 10,000 = ₹1,60,000$$

**Solution 1 (c)**

$$(a) \text{ EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 7,500 \times 12 \times 15}{1.50 \times 20\%}} = 3,000 \text{ valves}$$

$$\text{Number of orders} = (7,500 \times 12) \div 3,000 = 30 \text{ orders}$$

$$\text{Frequency of orders} = 360 \text{ days} \div 30 \text{ orders} = 12 \text{ days}$$

$$(b) \text{ Re-order point} = \text{Average consumption} \times \text{Average lead time} + \text{Safety stock}$$

$$= \frac{7,500 \times 12}{360} \times 45 \text{ days (1.5 months} \times 30 \text{ days)} + 3,200$$

$$= 14,450 \text{ valves}$$

$$(c) \text{ EOQ} = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 7,500 \times 12 \times 15}{4.50 \times 20\%}} = 1,732.05 \text{ valves}$$

**Solution 1 (d)**

(a) BEP in value (₹) and units:

$$\begin{aligned} \text{BEP in value (₹)} &= \text{Fixed Cost} \div \text{P/V Ratio} \\ &= ₹16,80,000 \div 40\% = ₹42,00,000 \end{aligned}$$

$$\begin{aligned} \text{BEP in units} &= \text{Fixed Cost} \div \text{Contribution per unit} \\ &= ₹16,80,000 \div 120 (300 - 180) = 14,000 \text{ units} \end{aligned}$$

(b) Margin of Safety:

$$\begin{aligned} \text{MOS in value (₹)} &= \text{Profit} \div \text{P/V Ratio} \\ &= ₹7,20,000 \div 40\% = ₹18,00,000 \end{aligned}$$

(c) Profit at 24,000 units:

$$\begin{aligned} \text{Profit} &= \text{Contribution} - \text{Fixed cost} \\ &= (24,000 \times ₹120) - ₹16,80,000 = ₹12,00,000 \end{aligned}$$

(d) Sales in value (₹) to earn a profit of ₹10,00,000:

$$\begin{aligned} \text{Sales in value (₹)} &= (\text{Fixed Cost} + \text{Profit}) \div \text{P/V Ratio} \\ &= (₹16,80,000 + ₹10,00,000) \div 40\% = ₹67,00,000 \end{aligned}$$

Working Note:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sale Price}} \times 100 = \frac{300 - 180}{300} \times 100 = 40\%$$

**Solution 2 (a)**

(a) Machine hour rate for the company as a whole for a month:

$$(A) \text{ When the Robot is used} = \frac{69,000}{2,000 \text{ hrs}} = ₹34.50$$

$$(B) \text{ When the Robot is not used} = \frac{18,000}{1,500 \text{ hrs}} = ₹12.00$$

(b) Machine hour rate for individual jobs:

Particulars	Vulcanising		Brushing		Striping	
	Hours	₹	Hours	₹	Hours	₹
Without Robot @ ₹12.00 per hour	500	6,000	1,000	12,000	-	-
With Robot @ ₹34.50 per hour	400	13,800	400	13,800	1,200	41,400
Total Overheads	-	19,800	-	25,800	-	41,400
÷ Hours	-	÷900	-	÷1,400	-	÷1,200
Machine Hour Rate	-	22.00	-	18.43	-	34.50

Working note:

1. Total machine hours used (500 + 1,000 + 400 + 400 + 1,200) 3,500

2. Total machine hours without the use of robot (500 + 1,000) 1,500

3. Total machine hours with the use of robot (400 + 400 + 1,200) 2,000

4. Total overheads of the machine per month:

Rent (₹18,000 ÷ 3 months)	₹6,000.00
Depreciation (₹19,20,000 × 10%) ÷ 12 months	₹16,000.00
Indirect Charges (₹12,00,000 × 20% ÷ 12 months)	₹20,000.00

Total		₹42,000.00	
5. Robot hire charges for a month (₹2,70,000 ÷ 6 months)			= ₹45,000
6. Overheads for using machines without Robot	=	$\frac{42,000}{3,500 \text{ hrs}} \times 1,500 \text{ hrs.}$	= ₹18,000
7. Overheads for using machines with Robot	=	$\frac{42,000}{3,500 \text{ hrs}} \times 2,000 \text{ hrs.} + ₹45,000$	
	=	₹69,000	

**Solution 2 (b)**

(1) Calculation of wages:

(a) Time rate = Number of hours × Wage rate per hour  
 = 48 Hours × ₹15 = ₹720

(b) Piece rate with guaranteed weekly wages:

Wages as per piece rate = Number of units produced × Piece rate  
 = 200 units × ₹4.50 = ₹900

or

Guaranteed weekly wages = Weekly hours × Wage rate per hour  
 = 48 Hours × ₹15 = ₹720

Worker will get whatever is higher i.e. ₹900

(c) Halsey System =  $(AH \times R) + 50\% (SH - AH) \times R$   
 =  $(48 \text{ hours} \times ₹15) + 50\% (60 - 48) \times ₹15 = ₹810$

(d) Rowan System =  $(AH \times R) + \frac{AH}{SH} \times (SH - AH) \times R$   
 =  $(48 \text{ hours} \times ₹15) + \frac{48}{60} \times (60 - 48) \times ₹15 = ₹864$

(2) As the company is planning to reduce labour cost, Halsey Premium Plan should be selected having lower cost.

Working Notes:

1. Computation of Straight piece rate:

Normal rate per hour	₹15
Standard time per unit	18 minutes
Straight piece rate	₹4.50 (₹15 × 18/60)

2. Standard Hours (SH) = 200 units × 18/60 = 60 hours

**Solution 2 (c)**

(a) Statement Showing Cost Allocated to Each Product Using Activity Based Costing

Activity Cost Pool	Cost Driver	Ratio	Amount	Express coffee	Instant coffee
Machine Processing	No. of machine hours	20 : 120	7,00,000	1,00,000	6,00,000
Set up related costs	No. set ups	20 : 44	7,68,000	2,40,000	5,28,000
Purchase related costs	No. of purchase	160 : 384	6,80,000	2,00,000	4,80,000
Total Cost				₹5,40,000	₹16,08,000

(b) Overhead cost per unit:

Express coffee	=	5,40,000 ÷ 5,000	=	₹108
Instant coffee	=	16,08,000 ÷ 60,000	=	₹26.80

**Solution 3 (a)**

(a) Calculation of toll rate for each type of vehicles:

$$\begin{aligned} \text{Total collection from toll} &= \text{Cost} + 10\% = ₹59,09,090 + 10\% \\ &= ₹64,99,999 \end{aligned}$$

Let, toll rate for Light weight vehicle be 'T' then toll rate for Medium weight vehicle will 2.5T and for Heavy weight vehicles will 5T

Now,

$$\begin{aligned} \text{Total Toll collection} &= (45,000 \times 2 \times T) + (12,000 \times 2 \times 2.5T) + (10,000 \times 2 \times 5T) \\ ₹64,99,999 &= 2,50,000T \\ T &= ₹26 \end{aligned}$$

$$\begin{aligned} \text{Toll rate for light vehicles} &= ₹26 \\ \text{Toll rate for light vehicles} &= 2.5T = ₹26 \times 2.5 = ₹65 \\ \text{Toll rate for light vehicles} &= 5T = ₹26 \times 5 = ₹130 \end{aligned}$$

Note: Toll plaza collects toll from 45,000 light weight vehicles one side journey (50,000 – 10% Exempt vehicles).

(b) Calculation of toll rate of Light weight vehicles with concession facility:

$$\text{Revenue earned from Light weight vehicles under (a)} = 45,000 \times 2 \times ₹26 = ₹23,40,000$$

Let, toll rate for Light weight vehicle be 'T' then toll rate for return Light weight vehicle be '0.75T'

$$\begin{aligned} \text{Revenue from Light weight vehicles} &= (45,000 \times T) + (45,000 \times 70\% \times T + 45,000 \times 30\% \times 0.75T) \\ ₹23,40,000 &= 86,625T \\ T &= ₹27.013 \end{aligned}$$

**Solution 3 (b)**

## (a) Process-I Account

Particulars	Units	₹	Particulars	Units	₹
To Raw Materials used	6,500	4,22,500	By Normal Loss	250	1,000
To Direct Wages		1,40,000	By Process-II Account @	6,000	6,00,000
To Direct Expenses		42,000	₹100 per unit		
(30% of ₹1,40,000)			By Abnormal Loss A/c @	250	25,000
To Manufacturing OH		21,500	₹100 per unit		
	6,500	6,26,000		6,500	6,26,000

$$\text{NCPU} = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{6,26,000 - 1,000}{6,500 - 250} = ₹100 \text{ p.u.}$$

## (b) Process-II Account

Particulars	Units	₹	Particulars	Units	₹
To Process-I A/c	6,000	6,00,000	By Normal Loss	500	8,000
To Direct Wages		1,30,000	By Finished Stock A/c @	5,500	7,92,000
To Direct Expenses		45,500	₹144 per unit		
(35% of ₹1,30,000)					
To Manufacturing OH		24,500			
	6,000	8,00,000		6,000	8,00,000

$$\text{NCPU} = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{8,00,000 - 8,000}{6,000 - 500} = ₹144 \text{ p.u.}$$

## (c) Finished Stock Account

Particulars	Units	₹	Particulars	Units	₹
To Process-II A/c	5,500	7,92,000	By COGS @ ₹144 per unit	5,000	7,20,000
			By Balance c/d	500	72,000
	5,500	7,92,000		5,500	7,92,000

**Solution 4 (a)**

(a) Statement Showing Rank on the basis of Contribution per Hectare

Particulars	Wheat	Rice	Maize
Sale price per kg	20	40	250
Less: Labour charges per kg	(8)	(10)	(120)
Less: Packing materials per kg	(2)	(2)	(10)
Less: Other variable expenses per kg	(4)	(1)	(20)
Contribution per kg	6	27	100
× Yield in kg per hectare	× 2,000	× 500	× 100
Contribution per Hectare	12,000	13,500	10,000
Rank	II	I	III

(b) Statement Showing Optimum Product Mix

Cereals	Rank	Minimum Area	Additional Area	Total Area	Yield per Hectare	Production in kgs.
Wheat	II	100	50 (b.f.)	150	2,000	3,00,000
Rice	I	40	50 - 40 = 10	50	500	25,000
Maize	III	10	-	10	100	1,000
Total		150	60	210	-	3,26,000

$$\begin{aligned} \text{(c) Maximum Profit} &= (3,00,000 \text{ kgs} \times ₹6) + (25,000 \text{ kgs} \times ₹27) + (1,000 \text{ kgs} \times ₹100) - ₹21,45,000 \\ &= ₹4,30,000 \end{aligned}$$

**Solution 4 (b)**

PNME Ltd.

Cost Sheet for the year ending 31.03.2022

Particulars	Cloth Mask	
	Total	Per unit
Direct Materials [(12,50,000 ÷ 50,000 × 2 + 1,50,000 × 1) × 50,000 × 2]	5,00,000	10.00
Direct Labour [(7,00,000 ÷ 50,000 × 1 + 1,50,000 × .6) × 50,000 × 1]	2,50,000	5.00
Prime Cost	7,50,000	15.00
Production OH [(4,00,000 ÷ 50,000 × 1 + 1,50,000 × 1) × 50,000 × 1]	1,00,000	2.00
Factory Cost	8,50,000	17.00
Administrative overheads @ 50% of production overheads	50,000	1.00
Cost of Production	9,00,000	18.00
Less: Closing stock [(9,00,000 ÷ 50,000) × 5,000]	(90,000)	-
Cost of Goods Sold	8,10,000	18.00
Selling Expenses (45,000 × 2)	90,000	2.00
Cost of Sales	9,00,000	20.00
Profit (b.f.)	6,75,000	15.00
Sales (45,000 × 35)	15,75,000	35.00

Note: Administrative overhead is specific to the product as it is directly related to production overheads as mentioned in the question and hence to be considered in cost of production only.

**Solution 5 (a)**

$$\begin{aligned} \text{(a) Material Cost Variance} &= (SQ \times SP) - (AQ \times AP) \\ &= ₹8,40,000 - ₹8,83,000 = ₹43,000 \text{ A} \end{aligned}$$

(b)	Material Price Variance	=	AQ × (SP – AP)		
	Material A	=	11,000 × (25 – 23)	=	₹22,000 F
	Material B	=	7,500 × (45 – 48)	=	₹22,500 A
	Material C	=	4,500 × (55 – 60)	=	₹22,500 A
	Total	=	22,000 F + 22,500 A + 22,500 A	=	₹23,000 A
(c)	Material Usage Variance	=	SP × (SQ – AQ)		
	Material A	=	25 × (10,000 – 11,000)	=	₹25,000 A
	Material B	=	45 × (7,000 – 7,500)	=	₹22,500 A
	Material C	=	55 × (5,000 – 4,500)	=	₹27,500 F
	Total	=	25,000 A + 22,500 A + 27,500 F	=	₹20,000 A
(d)	Material Yield Variance	=	(SQ × SP) – (RSQ × SP)		
		=	₹8,40,000 – ₹8,78,170	=	₹38,170 A

Working notes:

## 1. Basic Calculation

Materials	SQ × SP	RSQ × SP	AQ × SP	AQ × AP
A	10,000 × ₹25	10,455 × ₹25	11,000 × ₹25	11,000 × ₹23
B	7,000 × ₹45	7,318 × ₹45	7,500 × ₹45	7,500 × ₹48
C	5,000 × ₹55	5,227 × ₹55	4,500 × ₹55	4,500 × ₹60
Total	₹8,40,000	₹8,78,170	₹8,60,000	₹8,83,000

## 2. SQ of input for actual output:

Materials A	=	500 kgs × 20 times	=	10,000 kgs
Materials B	=	350 kgs × 20 times	=	7,000 kgs
Materials C	=	250 kgs × 20 times	=	5,000 kgs

## 3. RSQ (Revised Standard Quantity) of actual input:

Materials A	=	23,000 kgs × 500/1,100	=	10,455 kgs
Materials B	=	23,000 kgs × 350/1,100	=	7,318 kgs
Materials C	=	23,000 kgs × 250/1,100	=	5,227 kgs

**Solution 5 (b)**

## Reconciliation Statement

Particulars	Amount	Amount
Profit as per Financial Books		5,50,000
Add: Legal charges	15,250	
Preliminary expenses	25,750	
Interest paid on debentures	50,000	91,000
Less: Interim dividend received	4,50,000	
Over recovery of selling overheads	11,380	
Profit on sale of capital assets	30,000	
Under valuation of closing stock in cost accounts	25,000	
Over recovery of production overheads	10,200	(5,26,580)
Profit as per Cost Books		1,14,420

**Solution 5 (c)**

## (a) Statement Showing Profit Earned from Product 'L'

Particulars	Amount
Sales Value of Product 'L' (10,000 × ₹45)	4,50,000
Less: Further Processing Cost	(1,01,000)

Less: Net Joint Cost ( $\text{₹}4,00,000 - 200 \times \text{₹}5$ )	(3,99,000)
Profit	(50,000)

## (b) Statement Showing Selling Price of Product 'L'

Particulars	Amount
Further Processing Cost	1,01,000
Add: Net Joint Cost ( $\text{₹}4,00,000 - 200 \times \text{₹}5$ )	3,99,000
Add: Desired Profit	1,00,000
Sales Value	6,00,000
Selling Price ( $\text{₹}6,00,000 \div 10,000$ units)	₹60

**Solution 6 (a)**

- Financial Accounts
- Financial Accounts
- Financial Accounts
- Cost Accounts
- Cost Accounts
- Financial Accounts
- Financial Accounts
- Cost Accounts
- Financial Accounts
- Cost Accounts

**Solution 6 (b)**

- Research and Development hours, Number of new products developed
- Engineering hours, Number of employees employed
- Number of customers, number of minutes spent
- Sales revenue, Sales units
- Number of orders, Number of units sold

**Solution 6 (c)**

The budget manual is a booklet specifying the objectives of an organisation in relation to its strategy. The budget is made to decide how much an organisation would earn and spend and in what manner. In the budget, the organisation sets its priorities too.

Typical budget manual may include the following:

- A statement regarding the objectives of the organisation and how they can be achieved through budgetary control;
- A statement about the functions and responsibilities of each executive, both regarding preparation and execution of budgets;
- Procedures to be followed for obtaining the necessary approval of budgets. The authority of granting approval should be stated in explicit terms. Whether, one two or more signatures are required on each document should be clearly stated;
- A form of organisation chart to show who are responsible for the preparation of each functional budget and the way in which the budgets are interrelated.
- A timetable for the preparation of each budget.
- The manner of scrutiny and the personnel to carry it out;
- Reports, statements, forms and other record to be maintained;
- The accounts classification to be employed. It is necessary that the framework within which the costs, revenue and other financial accounts are classified must be identical both in the accounts and budget department;
- The reporting of the remedial action;
- The manner in which budgets, after acceptance and issuance, are to be revised or the matter amended these are included in budgets and on which action can be taken only with the approval of top management
- This will prevent the formation of a 'bottleneck' with the late preparation of one budget holding up the preparation of all others.

- (l) Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion.
- (m) A list of the organization's account codes, with full explanations of how to use them.
- (n) Information concerning key assumptions to be made by managers in their budgets, for example the rate of inflation, key exchange rates, etc.

(Student may write any four points)

***Solution 6 (d)***

- (a) Number
- (b) Cubic feet
- (c) Number of bricks
- (d) Kilo-watt hour
- (e) Ton
- (f) Passenger-km
- (g) Litre, gallon etc.
- (h) Barrel, ton, litre etc.
- (i) Barrel
- (j) Ton, per bag