

MOCK TEST PAPER – I
INTERMEDIATE (IPC): GROUP – I
PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT
Suggested Answers/Hints

1. (a) (i) Break-even sales = $\frac{\text{Fixed Cost}}{\text{P/V Ratio}}$

$$\text{P/V Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 \text{ or, } \frac{\text{Rs. 37,50,000}}{\text{Rs. 7,80,60,000} - \text{Rs. 5,93,10,000}} \times 100$$

$$\text{Or, } \frac{\text{Rs. 37,50,000}}{\text{Rs. 1,87,50,000}} \times 100 \text{ or, } 20\%$$

$$\text{Break-even sales} = \frac{\text{Rs. 98,50,000}}{20\%} = \text{Rs. 4,92,50,000}$$

(ii) Profit/ loss = Contribution – Fixed Cost
 = Rs. 8,20,00,000 × 20% - Rs. 98,50,000
 = Rs. 1,64,00,000 – Rs. 98,50,000 = Rs. 65,50,000

(iii) To earn same amount of profit in 20X8-X9 as was in 20X7-X8, it has to earn the same amount of contribution as in 20X7-X8.

Sales – Variable cost = Contribution equal to 20X7-X8 contribution

$$\begin{aligned} \text{Contribution in 20X7-X8} &= \text{Sales in 20X7-X8} \times \text{P/V Ratio in 20X7-X8} \\ &= \text{Rs. 5,93,10,000} \times 20\% = \text{Rs. 1,18,62,000} \end{aligned}$$

Let the number of units to be sold in 20X8-X9 = X

Sales in 20X8-X9 – Variable cost in 20X8-X9 = Desired Contribution

$$90 X - 80 X = \text{Rs. 1,18,62,000}$$

$$\text{Or, } 10 X = 1,18,62,000$$

$$\text{Or, } X = 11,86,200 \text{ units}$$

Therefore, Sales amount required to earn a profit equals to 20X7-X8 profit

$$= \text{Rs. } 90 \times 11,86,200 \text{ units} = \text{Rs. } 10,67,58,000$$

(b) (i) Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2 \times D \times S}{C}}$

Where, D = Annual demand i.e. 1.15% of 8,00,00,000 = 9,20,000 units

S = Set-up cost per run = Rs. 3,500

C = Inventory holding cost per unit per annum

$$= \text{Rs. } 1.5 \times 12 \text{ months} = \text{Rs. } 18$$

$$\text{EBQ} = \sqrt{\frac{2 \times 9,20,000 \text{ units} \times \text{Rs. } 3,500}{\text{Rs. } 18}} = 18,915 \text{ units}$$

(ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set-ups	Set-up Cost (Rs.)	Inventory holding cost (Rs.)	Total Cost (Rs.)
	40,000 units	23 $\left(\frac{9,20,000}{40,000}\right)$	80,500 (23 × Rs. 3,500)	3,60,000 $\left(\frac{40,000 \times \text{Rs. } 18}{2}\right)$	4,40,500
B	18,915 units	49 $\left(\frac{9,20,000}{18,915}\right)$	1,71,500 (49 × Rs. 3,500)	1,70,235 $\left(\frac{18,915 \times \text{Rs. } 18}{2}\right)$	3,41,735
	Extra Cost (A – B)				98,765

(c) Equated Monthly Installment (EMI) = $P \times r \times \frac{(1+r)^n}{(1+r)^n - 1}$

Where, P = Rs.3,00,000

$r = 0.18/12 = 0.015$

$n = 1 \times 12 = 12$

$$\text{EMI} = \text{Rs.}3,00,000 \times 0.015 \times \frac{(1+0.015)^{12}}{(1+0.015)^{12} - 1} = \text{Rs. } 4,500 \times \frac{1.1956}{0.1956} = \text{Rs.}27,506$$

Calculation of Total Interest to be paid upto the end of sixth month

End of month	Opening Balance (Rs.)	Payment (Rs.)	Interest (Rs.)	Principle Repayment (Rs.)	Outstanding at the end (Rs.)
	A	B = EMI	C = A × 0.015	D = B - C	E = A - D
1	3,00,000	27,506	4,500	23,006	2,76,994
2	2,76,994	27,506	4,155	23,351	2,53,643
3	2,53,643	27,506	3,805	23,701	2,29,942
4	2,29,942	27,506	3,449	24,057	2,05,885
5	2,05,885	27,506	3,088	24,418	1,81,467
6	1,81,467	27,506	2,722	24,784	1,56,683
			21,719		

Total interest upto the end of sixth month will be Rs.21,719

(The EMI figure may slightly differ due to rounding off errors)

(d) (a)
$$\text{G.P. ratio} = \frac{\text{Gross Profit}}{\text{Sales}} = 25\%$$

$$\text{Sales} = \frac{\text{Gross Profit}}{25} \times 100 = \frac{\text{Rs.}8,00,000}{25} \times 100 = \text{Rs.}32,00,000$$

(b) Cost of Sales = Sales – Gross profit
 = Rs. 32,00,000 - Rs. 8,00,000
 = Rs. 24,00,000

(c) Receivable turnover = $\frac{\text{Sales}}{\text{Debtors}} = 4$
= Debtors = $\frac{\text{Sales}}{4} = \frac{\text{Rs.32,00,000}}{4} = \text{Rs. 8,00,000}$

(d) Fixed assets turnover = $\frac{\text{Cost of Sales}}{\text{Fixed Assets}} = 8$
Fixed assets = $\frac{\text{Cost of Sales}}{8} = \frac{\text{Rs.24,00,000}}{8} = \text{Rs. 3,00,000}$

(e) Inventory turnover = $\frac{\text{Cost of Sales}}{\text{Average Stock}} = 8$
Average Stock = $\frac{\text{Cost of Sales}}{8} = \frac{\text{Rs.24,00,000}}{8} = \text{Rs. 3,00,000}$
Average Stock = $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$
Average Stock = $\frac{\text{Opening Stock} + \text{Opening Stock} + 20,000}{2}$
Average Stock = Opening Stock + Rs. 10,000
Opening Stock = Average Stock - Rs. 10,000
= Rs. 3,00,000 - Rs.10,000
= Rs. 2,90,000
Closing Stock = Opening Stock + Rs. 20,000
= Rs. 2,90,000 + Rs. 20,000 = Rs. 3,10,000

(f) Payable turnover = $\frac{\text{Purchase}}{\text{Creditors}} = 6$
Purchases = Cost of Sales + Increase in Stock
= Rs. 24,00,000 + Rs. 20,000 = Rs. 24,20,000
Creditors = $\frac{\text{Purchase}}{6} = \frac{\text{Rs.24,20,000}}{6} = \text{Rs. 4,03,333}$

(g) Capital turnover = $\frac{\text{Cost of Sales}}{\text{Capital Employed}} = 2$
Capital Employed = $\frac{\text{Cost of Sales}}{2} = \frac{\text{Rs.24,00,000}}{2} = \text{Rs.12,00,000}$

(h) Capital = Capital Employed – Reserves & Surplus
= Rs.12,00,000 – Rs.2,00,000 = Rs.10,00,000

Balance Sheet of T Ltd as on.....

Liabilities	Amount (Rs.)	Assets	Amount (Rs.)
Capital	10,00,000	Fixed Assets	3,00,000
Reserve & Surplus	2,00,000	Stock	3,10,000

Creditors	4,03,333	Debtors	8,00,000
		Other Current Assets	1,93,333
	16,03,333		16,03,333

[Sales value may also be used instead of Cost of sales to compute ratios]

2. (a)

Process-I A/c

Particulars	Qty. (kgs)	Amount	Particulars	Qty. (kgs)	Amount (Rs.)
To Material A	6,000	3,00,000	By Normal loss	500	8,000
To Material B	4,000	4,00,000	By Process-II A/c	9,200	7,38,857
To Labour	--	21,500	By Abnormal loss A/c	300	24,093
To Overhead ($\frac{\text{Rs.}92,000 \times 430 \text{ hrs}}{800 \text{ hrs}}$)	--	49,450			
	10,000	7,70,950		10,000	7,70,950

$$* \frac{\{(\text{₹}3,00,000 + \text{₹}4,00,000 + \text{₹}21,500 + \text{₹}49,450) - \text{₹}8,000\}}{(10,000 - 500) \text{ units}} = \frac{\text{₹}7,70,950 - \text{₹}8,000}{9,500 \text{ units}} = \text{Rs.}80.3105$$

Process-II A/c

Particulars	Qty. (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
To Process-I A/c	9,200	7,38,857	By Normal loss	1,000	--
To Material C	6,600	8,25,000	By Packing Dept. A/c (See the working notes)	18,000	18,42,496
To Material D	4,200	3,15,000	By WIP A/c (See the working notes)	1,000	1,00,711
To Flavouring essence	--	3,300			
To Labour	--	18,500			
To Overheads ($\frac{\text{Rs.}92,000 \times 370 \text{ hrs}}{800 \text{ hrs}}$)	--	42,550			
	20,000	19,43,207		20,000	19,43,207

Abnormal loss A/c

Particulars	Qty. (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
To Process-I A/c	300	24,093	By Bank	300	4,800
			By Costing Profit & Loss A/c	--	19,293
	300	24,093		300	24,093

Working Notes:

Calculation of Equivalent Production units

Input	Units	Output	Units	Process-I		Mat-C & D		Labour & OH	
				(%)	Units	(%)	Units	(%)	Units
	9,200	Transferred to Packing.	18,000	100	18,000	100	18,000	100	18,000
Mat-C	6,600	Closing WIP	1,000	100	1,000	100	1,000	50	500
Mat-D	4,200	Normal loss	1,000	--	--	--	--	--	--
	20,000		20,000		19,000		19,000		18,500

Calculation of Unit cost

Cost component	Amount (Rs.)	Equivalent units	Cost per unit (Rs.)
Transferred-in	7,38,857	19,000	38.8872
Material-C	8,25,000	19,000	43.4211
Material-D	3,15,000	19,000	16.5789
Flavouring essence	3,300	19,000	0.1737
Total Material Cost	18,82,157	19,000	99.0609
Labour	18,500	18,500	1.0000
Overheads	42,550	18,500	2.3000
Total Cost	19,43,207		102.3609

Value of Materials transferred to Packing Department

= 18,000 unit × Rs.102.3609 = 18,42,496

Value of WIP : For Materials- 1,000 units × Rs.99.0609 = Rs.99,061

For Labour & Overheads 500 units × Rs.3.30 = Rs.1,650

Rs.1,00,711

(b) (i) Computation of Earnings Per Share (EPS) for each Plan

Particulars	Plan A Rs.	Plan B Rs.	Plan C Rs.
Earnings Before Interest Tax (EBIT)	1,60,000	1,60,000	1,60,000
Less: Interest on debt at 8%	-	16,000	-
Earnings Before Tax	1,60,000	1,44,000	1,60,000
Less: Tax at 50%	80,000	72,000	80,000
Earnings After Tax	80,000	72,000	80,000
Less: Preference Dividend at 8%	-	-	16,000
Earnings available for equity shareholders	80,000	72,000	64,000
Number of Equity Shares	20,000	10,000	10,000
Earnings per share (EPs)	Rs.4.00	Rs.7.20	Rs.6.40

(ii) **Financial Break-even Point for Each Plan**

Plan A : There is no fixed financial charges, hence the financial break-even point for Plan A is zero.

Plan B : Fixed interest charges is Rs.16,000, hence the financial break-even point for Plan B is Rs.16,000

Plan C : Fixed Charge for preference dividend is Rs.16,000, hence, the financial break-even point for Plan C is Rs.16,000

(iii) **Between Plan A and C**

$$\frac{(X - 0)(1 - .5) - 0}{20,000} = \frac{(X - 0)(1 - .5) - 16000}{10,000}$$

$$\text{or } \frac{.5X}{20,000} = \frac{.5X - 16,000}{10,000}$$

$$\text{or, } .5X - X = -32,000$$

$$\text{or, } .5X = 32,000$$

$$\text{or, } X = \text{Rs.64,000}$$

Thus point of indifference between plan A and C is Rs.64,000.

3. (a) **Material Price Variance = Actual Quantity (Std. Price – Actual Price)**

$$X = 12,500 \text{ units (Rs.40 – Rs.44) = 50,000 (A)}$$

$$Y = 18,000 \text{ units (Rs.30 – Rs.28) = 36,000 (F)}$$

$$Z = 88,500 \text{ units (Rs.10 – Rs.12) = } \underline{1,77,000 (A)} \quad 1,91,000 (A)$$

Material Usage Variance = Std. Price (Std. Qty – Actual Qty.)

$$X = \text{Rs.40 (6,000} \times 2 - 12,500) = 20,000 (A)$$

$$Y = \text{Rs.30 (6,000} \times 3 - 18,000) = \text{Nil}$$

$$Z = \text{Rs.10 (6,000} \times 15 - 88,500) = \underline{15,000 (F)} \quad 5,000 (A)$$

Material Mix Variance = Std. Price (Revised Std. Qty. – Actual Qty.)

$$X = \text{Rs.40} \left(\frac{1,19,000 \times 2}{20} - 12,500 \right) = 24,000 (A)$$

$$Y = \text{Rs.30} \left(\frac{1,19,000 \times 3}{20} - 18,000 \right) = 4,500 (A)$$

$$Z = \text{Rs.10} \left(\frac{1,19,000 \times 15}{20} - 88,500 \right) = \underline{7,500 (F)} \quad 21,000 (A)$$

Material Yield Variance = Std. Price (Std. Qty. – Revised Std. Qty.)

$$X = \text{Rs.40} \left(6,000 \times 2 - \frac{1,19,000 \times 2}{20} \right) = 4,000 (F)$$

$$Y = \text{Rs.30} \left(6,000 \times 3 - \frac{1,19,000 \times 3}{20} \right) = 4,500 (F)$$

$$Z = \text{Rs.10} \left(6,000 \times 15 - \frac{1,19,000 \times 15}{20} \right) = \underline{7,500 (F)} \quad 16,000 (F)$$

Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
 = 2,500 hours (Rs.55 – Rs.58) = 7,500 (A)

Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
 = Rs.55 (6,000 × 3 – 17,500) = 27,500 (F)

(b) Estimate of the Requirement of Working Capital

	(Rs.)	(Rs.)
A. Current Assets:		
Raw material stock (Refer to Working note 3)	6,64,615	
Work in progress stock (Refer to Working note 2)	5,00,000	
Finished goods stock (Refer to Working note 4)	13,60,000	
Debtors/ Receivables (Refer to Working note 5)	25,10,769	
Cash and Bank balance	<u>25,000</u>	50,60,384
B. Current Liabilities:		
Creditors for raw materials (Refer to Working note 6)	7,15,740	
Creditors for wages (Refer to Working note 7)	<u>91,731</u>	8,07,471
Net Working Capital (A - B)		<u>42,52,913</u>

Working Notes:

1. Annual cost of production

	Rs.
Raw material requirements (1,04,000 units × Rs. 80)	83,20,000
Direct wages (1,04,000 units × Rs. 30)	31,20,000
Overheads (exclusive of depreciation) (1,04,000 × Rs. 60)	<u>62,40,000</u>
	<u>1,76,80,000</u>

2. Work in progress stock

	Rs.
Raw material requirements (4,000 units × Rs. 80)	3,20,000
Direct wages (50% × 4,000 units × Rs. 30)	60,000
Overheads (50% × 4,000 units × Rs. 60)	<u>1,20,000</u>
	<u>5,00,000</u>

3. Raw material stock

It is given that raw material in stock is average 4 weeks' consumption. Since, the company is newly formed, the raw material requirement for production and work in progress will be issued and consumed during the year.

Hence, the raw material consumption for the year (52 weeks) is as follows:

	Rs.
For Finished goods	83,20,000
For Work in progress	<u>3,20,000</u>
	<u>86,40,000</u>

Raw material stock $\frac{\text{Rs. } 86,40,000}{52 \text{ weeks}} \times 4 \text{ weeks}$ i.e. Rs. 6,64,615

4. Finished goods stock

8,000 units @ Rs. 170 per unit = Rs.13,60,000

5. Debtors/ Receivables for sale

Credit allowed to debtors	Average 8 weeks
Credit sales for year (52 weeks) i.e. (1,04,000 units - 8,000 units)	96,000 units
Cost per unit	Rs.170
Credit sales for the year (96,000 units × Rs.170)	Rs.1,63,20,000
Debtors	$\frac{\text{Rs. } 1,63,20,000}{52 \text{ weeks}} \times 8 \text{ weeks}$ i.e. Rs.25,10,769

6. Creditors for raw material:

Credit allowed by suppliers	Average 4 weeks
Purchases during the year (52 weeks) i.e. (Rs.83,20,000 + Rs.3,20,000 + Rs.6,64,615) (Refer to Working notes 1,2 and 3 above)	Rs.93,04,615
Creditors	$\frac{\text{Rs. } 93,04,615}{52 \text{ weeks}} \times 4 \text{ weeks}$ i.e. Rs.7,15,740

7. Creditors for wages

Lag in payment of wages	Average $1 \frac{1}{2}$ weeks
Direct wages for the year (52 weeks) i.e. (Rs.31,20,000 + Rs. 60,000) (Refer to Working notes 1 and 2 above)	Rs.31,80,000
Creditors	$\frac{\text{Rs. } 31,80,000}{52 \text{ weeks}} \times 1 \frac{1}{2} \text{ weeks}$ i.e. Rs. 91,731

4. (a) Effective machine hours = 200 hours × 75% = 150 hours

Computation of Comprehensive Machine Hour Rate

	Per month (Rs.)	Per hour (Rs.)
Fixed cost		
Supervision charges	18,000.00	
Electricity and lighting	9,500.00	
Insurance of Plant and building (Rs.18,250 ÷12)	1,520.83	

Other General Expenses (Rs.17,500÷12)	1,458.33	
Depreciation (Rs.64,800÷12)	5,400.00	
	35,879.16	239.19
Direct Cost		
Repairs and maintenance	17,500.00	116.67
Power	65,000.00	433.33
Wages of machine man		139.27
Wages of Helper		109.41
Machine Hour rate (Comprehensive)		1,037.87

Wages per machine hour

	Machine man	Helper
Wages for 200 hours		
Machine-man (Rs.400 × 25)	Rs.10,000.00	---
Helper (Rs.275 × 25)	---	Rs.6,875.00
Dearness Allowance (DA)	Rs.4,575.00	Rs.4,575.00
	Rs.14,575.00	Rs.11,450.00
Production bonus (1/3 of Basic and DA)	4,858.33	3,816.67
Leave wages (10% of Basic and DA)	1,457.50	1,145.00
	20,890.83	16,411.67
Effective wage rate per machine hour	Rs.139.27	Rs.109.41

(b) (i) **Computation of Costs of Different Components of Capital**
Equity Shares

$$K_e = \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g$$

$$= \frac{\text{Rs.}3.60(1.09)}{\text{Rs.}54} + 0.09 = 0.0727 + 0.09 = 16.27\%$$

Preference Shares

$$K_p = \frac{\text{Preference Share Dividend}}{P_0} = \frac{\text{Rs.}11}{\text{Rs.}95} = 11.58\%$$

Debt at $K_d = 12\%$

$$K_d(1 - T) = 12(1 - 0.4) = 12\%(0.6) = 7.20\%$$

(ii) **Weighted Average Cost of Capital (WACC)**

$$\text{WACC} = W_d K_d(1 - T) + W_p K_p + W_e K_e$$

$$\text{WACC} = 0.25(7.2\%) + 0.15(11.58\%) + 0.60(16.27\%)$$

$$= 1.8 + 1.737 + 9.762 = 13.30\%$$

5. (a) **Cost plus contract:** Under cost plus contract, the contract price is ascertained by adding a percentage of profit to the total cost of the work. Such types of contracts are entered into when it is not possible to estimate the contract cost with reasonable accuracy due to unstable condition of material, labour services etc.

Following are the advantages of cost plus contract:

- (i) The contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.
- (ii) It is useful specially when the work to be done is not definitely fixed at the time of making the estimate.
- (iii) Contractee can ensure himself about the 'cost of contract' as he is empowered to examine the books and documents of the contractor to ascertain the veracity of the cost of contract.

(b) **Apportionment of Joint Cost amongst Joint Products using:**

Market value at the point of separation

This method is used for apportionment of joint costs to joint products upto the split off point. It is difficult to apply if the market value of the product at the point of separation is not available. It is useful method where further processing costs are incurred disproportionately.

Net realizable value Method

From the sales value of joint products (at finished stage) the followings are deducted:

- Estimated profit margins
- Selling & distribution expenses, if any
- Post split off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

- (c) **Modified Internal Rate of Return (MIRR):** There are several limitations attached with the concept of the conventional Internal Rate of Return. The MIRR addresses some of these deficiencies. For example, it eliminates multiple IRR rates; it addresses the reinvestment rate issue and produces results, which are consistent with the Net Present Value method.

Under this method, all cash flows, apart from the initial investment, are brought to the terminal value using an appropriate discount rate (usually the cost of capital). This results in a single stream of cash inflow in the terminal year. The MIRR is obtained by assuming a single outflow in the zeroth year and the terminal cash inflow as mentioned above. The discount rate which equates the present value of the terminal cash in flow to the zeroth year outflow is called the MIRR.

(d) **Advantages of Raising Funds by Issue of Equity Shares**

- (i) It is a permanent source of finance. Since such shares are not redeemable, the company has no liability for cash outflows associated with its redemption.
- (ii) Equity capital increases the company's financial base and thus helps further the borrowing powers of the company.
- (iii) The company is not obliged legally to pay dividends. Hence in times of uncertainties or when the company is not performing well, dividend payments can be reduced or even suspended.
- (iv) The company can make further issue of share capital by making a right issue.

6. (a) (i) **Annual Cost Statement of three vehicles**

	(Rs.)
Diesel $\{(1,34,784 \text{ km.} \div 4 \text{ km}) \times \text{Rs. } 65\}$ (Refer to Working Note 1)	21,90,240

Oil & sundries {(1,34,784 km. ÷ 100 km.) × Rs. 250}	3,36,960
Maintenance {(1,34,784 km. × Rs. 0.25) + Rs. 6,000} (Refer to Working Note 2)	39,696
Drivers' salary {(Rs.24,000 × 12 months) × 3 trucks}	8,64,000
Licence and taxes (Rs. 25,000 × 3 trucks)	75,000
Insurance	45,000
Depreciation {(Rs. 29,00,000 ÷ 10 years) × 3 trucks}	8,70,000
General overhead	1,15,600
Total annual cost	45,36,496

(ii) Cost per km. run

$$\text{Cost per kilometer run} = \frac{\text{Total annual cost of vehicles}}{\text{Total kilometre travelled annually}} \quad (\text{Refer to Working Note 1})$$

$$= \frac{\text{Rs. } 45,36,496}{1,34,784 \text{ Kms}} = \text{Rs. } 33.66$$

(iii) Freight rate per tonne km (to yield a profit of 10% on freight)

$$\text{Cost per tonne km.} = \frac{\text{Total annual cost of three vehicles}}{\text{Total effective tonnes kms. per annum}} \quad (\text{Refer to Working Note 1})$$

$$= \frac{\text{Rs. } 45,36,496}{6,06,528 \text{ kms}} = \text{Rs. } 7.48$$

$$\text{Freight rate per tonne km.} \left(\frac{\text{Rs. } 7.48}{0.9} \right) \times 1 = \text{Rs. } 8.31$$

Working Notes:

1. Total kilometer travelled and Commercial tonnes kilometer (load carried) by three trucks in one year

Truck	One way distance in kms	No. of trips	Total distance covered in km per day (with load)	Total distance covered in km per day (up & down)	Load carried per trip / day in tonnes	Total effective tonnes km
	a	b	c = a × b	d = c × 2	e	f = 27/3 × c
1	16	4	64	128	6	576
2	40	2	80	160	9	720
3	30	3	90	180	12	810
Total			234	468	27	2,106

Total kilometre travelled by three trucks in one year

$$(468 \text{ km.} \times 24 \text{ days} \times 12 \text{ months}) = 1,34,784$$

Total effective tonnes kilometre of load carried by three trucks during one year

$$(2,106 \text{ tonnes km.} \times 24 \text{ days} \times 12 \text{ months}) = 6,06,528 \text{ tonne-km}$$

2. Fixed and variable component of maintenance cost:

$$\begin{aligned} \text{Variable maintenance cost per km.} &= \frac{\text{Difference in maintenance cost}}{\text{Difference in distance travelled}} \\ &= \frac{\text{Rs. 46,050} - \text{Rs. 45,175}}{1,60,200 \text{ kms} - 1,56,700 \text{ kms}} = \text{Rs. 0.25} \end{aligned}$$

$$\begin{aligned} \text{Fixed maintenance cost} &= \text{Total maintenance cost} - \text{Variable maintenance cost} \\ &= \text{Rs. 46,050} - 1,60,200 \text{ kms} \times \text{Rs. 0.25} = \text{Rs. 6,000} \end{aligned}$$

(b) (i) Payback Period Method

The cumulative cash flows for each project are as follows:

Year	Cumulative Cash Flows	
	Project X (Rs.)	Project Y (Rs.)
0	(10,00,000)	(10,00,000)
1	(3,50,000)	(6,50,000)
2	(50,000)	(3,00,000)
3	2,50,000	50,000
4	3,50,000	4,00,000

$$\text{Payback}_x = 2 + \frac{\text{Rs. 50,000}}{\text{Rs. 3,00,000}} = 2.17 \text{ years.}$$

$$\text{Payback}_y = 2 + \frac{\text{Rs. 3,00,000}}{\text{Rs. 3,50,000}} = 2.86 \text{ years.}$$

Net Present Value (NPV)

$$\begin{aligned} \text{NPV}_x &= -\text{Rs. 10,00,000} + \frac{\text{Rs. 6,50,000}}{(1.12)^1} + \frac{\text{Rs. 3,00,000}}{(1.12)^2} + \frac{\text{Rs. 3,00,000}}{(1.12)^3} + \frac{\text{Rs. 1,00,000}}{(1.12)^4} \\ &= \text{Rs. 96601.} \end{aligned}$$

$$\begin{aligned} \text{NPV}_y &= -\text{Rs. 10,00,000} + \frac{\text{Rs. 3,50,000}}{(1.12)^1} + \frac{\text{Rs. 3,50,000}}{(1.12)^2} + \frac{\text{Rs. 3,50,000}}{(1.12)^3} + \frac{\text{Rs. 3,50,000}}{(1.12)^4} \\ &= \text{Rs. 63072.} \end{aligned}$$

Internal Rate of Return (IRR)

To solve for each project's IRR, find the discount rates that equate each NPV to zero:

$$\text{IRR}_x = 18.0\%$$

$$\text{IRR}_y = 15.0\%$$

(ii) The following table summarizes the project rankings by each method:

	Project that ranks higher
Payback	X
NPV	X
IRR	X

Analysis: All methods rank Project X over Project Y. In addition, both projects are acceptable under the NPV and IRR criteria. Thus, both projects should be accepted if they are independent.

7. (a) Effect of overtime payment on productivity: Overtime work should be resorted to only when it is extremely essential because it involves extra cost. The overtime payment increases the cost of production in the following ways:
1. The overtime premium paid is an extra payment in addition to the normal rate.
 2. The efficiency of operators during overtime work may fall and thus output may be less than normal output.
 3. In order to earn more the workers may not concentrate on work during normal time and thus the output during normal hours may also fall.
 4. Reduced output and increased premium of overtime will bring about an increase in cost of production.
- (b) In integrated accounting system cost and financial accounts are kept in the same set of books. Such a system will have to afford full information required for Costing as well as for Financial Accounts. In other words, information and data should be recorded in such a way so as to enable the firm to ascertain the cost (together with the necessary analysis) of each product, job, process, operation or any other identifiable activity. It also ensures the ascertainment of marginal cost, variances, abnormal losses and gains. In fact all information that management requires from a system of Costing for doing its work properly is made available. The integrated accounts give full information in such a manner so that the profit and loss account and the balance sheet can be prepared according to the requirements of law and the management maintains full control over the liabilities and assets of its business.
- Since, only one set of books are kept for both cost accounting and financial accounting purpose so there is no necessity of reconciliation of cost and financial accounts.
- (c) **Ploughing back of Profits:** Long-term funds may also be provided by accumulating the profits of the company and ploughing them back into business. Such funds belong to the ordinary shareholders and increase the net worth of the company. A public limited company must plough back a reasonable amount of its profits each year keeping in view the legal requirements in this regard and its own expansion plans. Such funds also entail almost no risk. Further, control of present owners is also not diluted by retaining profits.
- (d) Advantages of Electronic Cash Management System
- (i) Significant saving in time.
 - (ii) Decrease in interest costs.
 - (iii) Less paper work.
 - (iv) Greater accounting accuracy.
 - (v) More control over time and funds.
 - (vi) Supports electronic payments.
 - (vii) Faster transfer of funds from one location to another, where required.
 - (viii) Speedy conversion of various instruments into cash.
 - (ix) Making available funds wherever required, whenever required.
 - (x) Reduction in the amount of 'idle float' to the maximum possible extent.
 - (xi) Ensures no idle funds are placed at any place in the organization.
 - (xii) It makes inter-bank balancing of funds much easier.
 - (xiii) It is a true form of centralised 'Cash Management'.

- (xiv) Produces faster electronic reconciliation.
- (xv) Allows for detection of book-keeping errors.
- (xvi) Reduces the number of cheques issued.
- (xvii) Earns interest income or reduce interest expense.

(Any four valid points)

- (e) Controllable costs and Uncontrollable costs:** Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre.

Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs.