

MOCK TEST PAPER – 1
IPCC/PCC: GROUP – I/GROUP – II
PAPER – 3/4 : COST ACCOUNTING AND FINANCIAL MANAGEMENT
PART – I : COST ACCOUNTING
SUGGESTED ANSWERS/HINTS

1. (i) **Cost Centre:** The term cost centre is defined as a location, person or an item of equipment or a group of these for which costs may be ascertained and used for the purposes of cost control. Cost centres can be personal cost centres, impersonal cost centres, operation cost centres and process cost centres.

Cost Unit: The term cost unit is defined as a unit of quantity of product, service or time (or a combination of these) in relation to which costs may be ascertained or expressed. It can be for a job, batch, or product group.

- (ii) **Economic Order Quantity:** Economic order quantity represents the size of the order for which both ordering and carrying costs together are minimum. If purchases are made in large quantities, inventory carrying cost will be high. If the order size is small, ordering cost will be high. Hence, it is necessary to determine the order quantity for which ordering and carrying costs are minimum. The formula used for determining economic order quantity is as follows:

$$EOQ = \sqrt{\frac{2AO}{C}}$$

Where:

- A is the annual consumption of material in units
 - O is the cost of placing an order (ordering cost per order)
 - C is cost of interest and storing one unit of material for one year (carrying cost per unit per annum)
- (iii) When a contract is likely to take long to complete or even to commence and the price is fixed, the contractor would like to protect his interest against a high rise in the prices of materials, wage rates etc. This he does through what is called an "escalation clause" which states the increase in the contract price for a given increase in the prices of inputs. For example, it may state that if the price of steel goes up by 10%, the contract price will increase by 1.5%. This implies that the base prices of inputs should be agreed upon and also that the date after which increase in prices will be taken into account will be fixed. The contractor is not compensated for price changes which could be avoided, for example, by completing the contract on time.

It is not necessary that the contractee must agree to the escalation clause; it is a matter of negotiation between the two parties.

- (iv) **Explicit costs:** These costs are also known as out of pocket costs. They refer to those costs which involves immediate payment of cash. Salaries, wages, postage and telegram, interest on loan etc. are some examples of explicit costs because they involve immediate cash payment. These payments are recorded in the books of account and can be easily measured.

Main points of difference: The following are the main points of difference between explicit and implicit costs.

- (i) Implicit costs do not involve any immediate cash payment. As such they are also known as imputed costs or economic costs.
 - (ii) Implicit costs are not recorded in the books of account but yet, they are important for certain types of managerial decisions such as equipment replacement and relative profitability of two alternative courses of action.
- (v) **Notional Rent:** It is a reasonable charge raised in the cost accounts for the use of owned premises. One reason for the use of such a nominal charge is to enable comparison between the cost of items made in factories which are owned and in rented factories. However, it may be noted that in the case of owned factory, cost for the same is accounted for by means of depreciation.

2. (a) **Statement showing the Issue Rate of Chemicals**

	Chemicals		
	A	B	C
	₹	₹	₹
Purchase Price	12,600	19,000	9,500
Add: Sales Tax @ 5% of purchase price (Refer to Working Note 2)	630	950	475
Add: Railway Freight in the ratio of 3:5:2 (Refer to Working Note 3)	300	500	200
Add: Octroi @ ` 0.10 per kg. On the quantity of material received (Refer to Working Note 1)	280	472	190
Add: Cartage	<u>22</u>	<u>63.12</u>	<u>31.80</u>
Total Price	<u>13,832</u>	<u>20,985.12</u>	<u>10,396.80</u>

$$\text{Rate of issue per Kg} = \frac{\text{Total price}}{\text{Qty. available for issue}} = \frac{\text{₹13,832}}{2,660\text{kg.}} = \frac{\text{₹ 0,985.12}}{4,484 \text{ Kg.}} = \frac{\text{₹ 10,396.80}}{1,805 \text{ kg.}}$$

$$(\text{Refer to Working Note 1}) = \text{₹ 5.20} = \text{₹ 4.68} = \text{₹ 5.76}$$

Working Notes:

1. Statement showing the quantity of chemicals available for issue

	Chemicals		
	A	B	C
	Kg.	Kg.	Kg.
Quantity purchased	3,000	5,000	2,000
Less: Shortage (Assumed to be normal)	<u>200</u>	<u>280</u>	<u>100</u>
Quantity received at the store	2,800	4,720	1,900
Less: Provision for further deterioration 5%	<u>140</u>	<u>236</u>	<u>95</u>
Quantity available for issue	<u>2,660</u>	<u>4,484</u>	<u>1,805</u>

2. $\text{Rate of sales Tax} = \frac{\text{Sales Tax}}{\text{Total Purchase price of Chemical}} \times 100 = \frac{\text{₹ } 2,055}{\text{₹ } 41,100} \times 100 = 5\%$

3. *Railway Freight*: It has been charged on the basis of quantity purchased i.e. A:3000 kg; B: 5000 kg; C: 2000 kg in the ratio of 3:5:2.

- (b) (1) **Statement of Joint Costs allocation between Caustic soda and Chlorine by using sales value method at split off**

Products	Caustic soda	Chlorine	Total
Sales value at split off (₹)	15,00,000 (1,200 tons x ₹ 1,250)	15,00,000 (800 tons x ₹ 1,875)	30,00,000
Weightage	0.5	0.5	
Joint costs allocated (₹)	12,50,000 (₹ 25,00,000 x 0.5)	12,50,000 (₹ 25,00,000 x 0.5)	25,00,000

- (2) **Statement of Joint Costs allocation between Caustic soda and Chlorine by using physical measure (tons) method**

Products	Caustic soda	Chlorine	Total
Physical measure (tons)	1,200	800	2,000
Weightage	0.6	0.4	
Joint costs allocated (₹)	15,00,000 (₹ 25,00,000 x 0.6)	10,00,000 (₹ 25,00,000 x 0.4)	25,00,000

(3) **Statement of Joint Costs allocation between Caustic soda and Chlorine by using estimated net realizable value method**

Products	Caustic soda	Chlorine	Total
Expected sales value of production (₹)	15,00,000 (1,200 tons x ₹ 1,250)	25,00,000 (500 tons x ₹ 5,000)	40,00,000
Less: Further processing cost (₹)	--	5,00,000	5,00,000
Estimated net realisable value at split off point (₹)	15,00,000	20,00,000	35,00,000
Weightage	3/7	4/7	
Joint cost allocated (₹)	10,71,429	14,28,571	25,00,000
	$\frac{3}{7} \times ₹ 25,00,000$	$\frac{4}{7} \times ₹ 25,00,000$	
(ii) Statement of gross margin percentage of Caustic soda and PVC under sales value, physical measure and estimated net realizable value methods			
	Sales value (at split off)	Physical Measure	Estimated net realizable value
Caustic soda:			
Sales (₹)	15,00,000	15,00,000	15,00,000
Less: Joint costs allocated (₹)	<u>12,50,000</u>	<u>15,00,000</u>	<u>10,71,429</u>
Gross margin (₹)	2,50,000	0	4,28,571
Gross margin (in %)	16.67	0	28.57
	$\frac{₹ 2,50,000}{₹ 15,00,000} \times 100$		$\frac{₹ 4,28,571}{₹ 15,00,000} \times 100$
PVC:			
Sales (₹) (500 tons x ₹ 5,000)	25,00,000	25,00,000	25,00,000
Less: Joint cost allocated (₹)	12,50,000	10,00,000	14,28,571
Less: Further processing cost (₹)	<u>5,00,000</u>	<u>5,00,000</u>	<u>5,00,000</u>
Gross margin (₹)	7,50,000	10,00,000	5,71,429
Gross margin (in %)	30	40	22.86

	$\frac{\text{₹ } 7,50,000}{\text{₹ } 25,00,000} \times 100 = \frac{3}{10}$	$\frac{\text{₹ } 10,00,000}{\text{₹ } 25,00,000} \times 100 = \frac{4}{10}$	$\frac{\text{₹ } 5,71,429}{\text{₹ } 25,00,000} \times 100 = \frac{2}{10}$
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3. (a)

Contract Account

(for the period: between 1st April and 31st Dec. 2011)

	₹		₹
To Materials	2,58,100	By Materials at site	25,400
To Labour engaged	5,60,500	By Materials sold	4,000
To Foremen's salary	79,300	By Profit & Loss A/c (Loss on material sale)	500
To Supervisor's salary (See working note 1)	27,000	By Cost of work done c/d	10,49,000
To Depreciation of plant (See working note 2)	14,000		
To Administrative and other expenses	1,40,000		
	<u>10,78,900</u>		<u>10,78,900</u>
To Cost of work done b/d	10,49,000	By Work-in-Progress Work certified	10,00,000
To Notional Profit c/d	2,13,250	Work uncertified (See Working Note 3)	2,62,250
	<u>12,62,250</u>		<u>12,62,250</u>
To Profit & Loss A/c (See Working Note 4)	1,06,625	By Notional Profit b/d	2,13,250
To Profit Reserve	<u>1,06,625</u>		
	<u>2,13,250</u>		<u>2,13,250</u>
Dr.			Cr.
	₹		₹
To Balance c/d	<u>7,50,000</u>	By Cash	<u>7,50,000</u>

Balance Sheet

(as on 31st December, 2011)

	₹		₹	₹
Profit & Loss A/c (See Working	1,07,125	Work-in-Progress Work Certified	10,00,000	

Note 4)		Work Uncertified	2,62,250	
			<u>12,62,250</u>	
		Less: Reserve	<u>1,06,625</u>	
			11,55,625	
		Less: Cash Received	<u>7,50,000</u>	4,05,625
		Material at site		25,400
		Plant at site (See Working Note 5)		<u>2,40,000</u>

Working Notes

1. Supervisor's Salary = $\frac{3}{4}$ (9 months $\times$ ₹ 4,000) = ₹ 27,000
2. Depreciation of Plant = $\frac{\text{₹ } 2,60,000 - \text{₹ } 15,000}{7 \text{ years}} \times \frac{146}{365} = \text{₹ } 14,000$
3. Cost of Work Uncertified

Cost of 2/3rd of the Contract is ₹ 10,49,000

Hence the Cost of the Contract is ₹ 10,49,000 $\times \frac{3}{2} = \text{₹ } 15,73,500$.

The cost of 50% of the Contract, which has been completed and certified by the Architect is ₹ 7,86,750 (₹ 15,73,500 , 2).

The Cost of 1/6th of the contract, which has been completed but not certified by the Architect is ₹ 2,62,250 (₹ 10,49,000 – ₹ 7,86,750).

Profit & Loss A/c

	₹		₹
To Contract A/c (Loss on the sale of material)	500	By Contract A/c (Profit transferred)	1,06,625*
To Balance c/d	<u>1,07,125</u>	By Profit on the Sale of Plant.	1,000
	1,07,625		<u>1,07,625</u>

* Profit transferred to P & L A/c = $\frac{2}{3} \times \text{₹ } 2,13,250 \times \text{Cash received / Work Certified}$

$$= \frac{2}{3} \times \text{₹ } 2,13,250 \times \text{₹ } 7,50,000 / \text{₹ } 10,00,000 = \text{₹ } 1,06,625$$

Plant A/c

	₹		₹
To Balance b/d	2,60,000	By Current A/c	14,000
To P & L A/c	1,000	(Depreciation)	6,500
(Profit on Sale of Plant)		By Cash Sale	2,40,500
	2,61,000	By Balance c/d	2,61,000

Note: Plant A/c can also form part of Contract A/c

(b) (i) Earnings of a Worker under Halsey Plan

Earnings = Hrs. worked × Rate per hour + $\frac{1}{2}$ Time saved hrs. × Rate per hour

= 48 hrs. × 0.50 paise + $\frac{1}{2}$ × 12 hrs. × 0.50 paise

(Refer to working note 2)

= ₹ 24 + ₹ 3 = ₹ 27

(ii) Earnings of a worker under Rowan Plan

Earnings = Hrs. worked × Rate per hour + $\frac{\text{Time saved}}{\text{Time allowed}}$ × Time taken hrs. × Rate per hour

Rate per hour

= 48 hrs. × 0.50 paise + $\frac{12}{60}$ hrs. × 48 hrs. × 0.50 paise

(Refer to working notes 1 & 2)

= ₹ 24 + ₹ 4.80 = ₹ 28.80

Working notes:

- Time Allowed to produce 20 dozen articles

Standard time allowed for producing one dozen articles 3 hours

Standard time allowed for producing 20 dozen articles 60 hours

- Time saved

Standard time to produce 20 dozen articles 60 hours

Actual time taken by the worker to produce 20 dozen articles 48 hours

Time saved 12 hours

- Work produced by the gang 1,800 standard labour hours, i.e.,

$\frac{1,800}{32+12+6}$ or 36 gang hours

Standard hours of Skilled Labour 36 × 32 1,152 hours

Standard hours of Semi-skilled Labour	36 ´ 12	432 hours
Standard hours of Un-skilled Labour	36 ´ 6	216 hours
Total		1,800 hours
Actual hours of Skilled Labour	40 ´ 28	1,120 hours
Actual hours of Semi-skilled Labour	40 ´ 18	720 hours
Actual hours of Un-skilled Labour	40 ´ 4	160 hours
Total		2,000 hours

Revised Standard hours (actual hours worked expressed in standard ratio)

Skilled Labour	$\frac{1,152}{1,800} \times 2,000$	1,280 hours
Semi-skilled Labour	$\frac{432}{1,800} \times 2,000$	480 hours
Unskilled Labour	$\frac{216}{1,800} \times 2,000$	240 hours
Total		2000 hours

Standard Cost for Actual Output: ₹

Skilled Labour	1,152 hours @ ₹ 3	3,456
Semi-skilled Labour	432 hours @ ₹ 2	864
Unskilled Labour	216 hours @ ₹ 1	216
	1,800 hours	4,536

Actual Cost:

Skilled Labour	1,120 hours @ ₹ 4	4,480
Semi-skilled Labour	720 hours @ ₹ 3	2,160
Unskilled Labour	160 hours @ ₹ 2	320
	2,000 hours	6,960

(i) Total Labour Cost Variance

Standard Cost - Actual Cost	₹
₹ 4,536 – ₹ 6,960	2,424 A

(ii) Labour Efficiency Variance:

(Standard hours for Actual Output - Revised Standard hours) ´ Standard Rate

Skilled	(1,152 - 1,280) ´ ₹ 3	384 A
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Semi -skilled	(432 - 480) ´ ₹ 2	96 A	
Un-skilled	(216 - 240) ´ ₹ 1	24 A	
		504 A	504 A

(iii) Labour Mix Variance :

(Revised Standard Hours - Actual Hours) ´ Standard Rate

Skilled	(1,280 - 1,120) ´ ₹ 3	480 F	
Semi-skilled	(432 - 480) ´ ₹ 2	480 A	
Un-skilled	(216 - 240) ´ ₹ 1	80 F	
		80 F	80 F

(iv) Rate of Wage Variance:

(Standard Rate - Actual Rate) ´ Actual Hours

Skilled	(₹ 3 - ₹ 4) ´ 1,120	1,120 A	
Semi-skilled	(₹ 2 - ₹ 3) ´ 720	720 A	
Un-skilled	(₹ 1 - ₹ 1) ´ 160	160 A	
		2,000 A	2,000 A
Check : Total Labour Cost Variance = Efficiency + Mix + Rate			2,424 A

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PART – II : FINANCIAL MANAGEMENT

1. (i) Limitations of Profit Maximisation Objective of Financial Management

- (a) Time factor is ignored.
- (b) It is vague because it is not clear whether the term relates to economic profit, accounting profit, profit after tax or before tax.
- (c) The term maximization is also ambiguous.
- (d) It ignores the risk factor.

(ii) Debt Service Coverage Ratio: Lenders are interested in this ratio to judge the firm's ability to pay off current interest and installments.

$$\text{Debt service coverage ratio} = \frac{\text{Earnings available for debt service}}{\text{Interest} + \text{Instalment}}$$

Where,

Earning for debt service = Net profit

+ Non-cash operating expenses like depreciation and other amortizations

+ Non-operating adjustments like loss on sale of

+ Fixed assets + Interest on Debt Fund.

(iii) Features of Deep Discount Bonds: Deep discount bonds are a form of zero-interest bonds. These bonds are sold at discounted value and on maturity; face value is paid to the investors. In such bonds, there is no interest payout during the lock-in period. The investors can sell the bonds in stock market and realise the difference between face value and market price as capital gain.

IDBI was the first to issue deep discount bonds in India in January 1993. The bond of a face value of ₹ 1 lakh was sold for ₹ 2700 with a maturity period of 25 years.

(iv) Close-ended and Open-ended Lease: In the close-ended lease, the assets gets transferred to the lessor at the end of lease, the risk of obsolescence, residual values etc. remain with the lessor being the legal owner of the assets. In the open-ended lease, the lessee has the option of purchasing the assets at the end of lease period.

(v) Calculation of Economic Order Quantity (EOQ)

The mean of monthly demand = 390 units, Annual demand (A) = $390 \times 12 = 4,680$ units

Ordering cost (O) = ₹ 40 per order, Cost per unit = ₹ 25.

Inventory carrying cost of one unit (CC) = $₹ 25 \times 35\% = ₹ 8.75$

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2AO}{CC}} \\ &= \sqrt{2 \times 4,680 \times \frac{40}{8.75}} = 206.85 \text{ or } 207 \text{ units} \end{aligned}$$

2. Balance Sheets of Alpha Limited

Liabilities	₹		Assets	₹	
	31 March 2010	31 March 2011		31 March 2010	31 March 2011
Equity share capital (₹ 10 each fully paid)	20,00,000	20,00,000	Fixed Assets (₹18,90,000–₹90,000)	18,00,000	15,39,000
Reserve and Surplus (balancing)	1,30,000	1,30,000	Long term investment	-	2,96,600
Profit & Loss A/c (15% of sales)	2,70,000	6,15,600	Current Assets (₹ 10,00,000)		
Current Liabilities			Stock	4,00,000	5,20,000
Bank Overdraft	1,00,000	-	Sundry Debtors	3,00,000	4,95,000
Creditors	3,00,000	4,15,000	Cash at Bank (Balancing)	3,00,000	3,10,000
Total	28,00,000	31,60,600	Total	28,00,000	31,60,600

Calculation for 31st March, 2010

(i) Calculation of Current Liabilities

Suppose that Current Liabilities = x, then current assets will be 2.5 x

Working capital = Current Assets – Current Liabilities

$$6,00,000 = 2.5x - x$$

$$x = 6,00,000 / 1.5 = ₹ 4,00,000 \text{ (C.L.)}$$

Other Current Liabilities = Current Liabilities – Bank Overdraft

(Creditors) $4,00,000 - 1,00,000 = ₹ 3,00,000$

Current Assets = $2.5 \times 4,00,000 = ₹ 10,00,000$

- (ii) Liquid Ratio = Liquid Assets / Current Liabilities or $1.5 = \text{Liquid Assets} / 4,00,000$
 $= ₹ 6,00,000$

Liquid assets = Current Assets – Stock

$6,00,000 = 10,00,000 - \text{Stock}$

So, Stock = ₹ 4,00,000

- (iii) Calculation of fixed assets: Fixed assets to proprietary fund is 0.75, working capital is therefore 0.25 of proprietary fund. So,

$6,00,000 / 0.25 \times 0.75 = ₹ 18,00,000$

- (iv) Debtors = $2 / 12 \times \text{Sales}$

$2 / 12 \times 18,00,000 = ₹ 3,00,000$

- (v) Sales = $(14,40,000 / 80) \times 100 = ₹ 18,00,000$

- (vi) Net profit = 15% of ₹ 18,00,000 = ₹ 2,70,000

Calculation for the year 31st March, 2011

- (vii) Sales = $18,00,000 + (18,00,000 \times 0.2) = 21,60,000$

- (viii) Calculation of fixed assets

	₹		₹
To Opening balance	18,00,000	By Banks (Sale)	90,000
		By Loss on sales of Fixed asset	90,000
		By P & L (Dep.) (5% as in previous year)	81,000
		By Balance b/d	<u>15,39,000</u>
Total	<u>18,00,000</u>		<u>18,00,000</u>

- (ix) Net profit for the year 2011, $16\% \times 21,60,000 = ₹ 3,45,600$

Total Profit = $2,70,000 + 3,45,600 = ₹ 6,15,600$

Calculation of fund from operation:

Net profit for the year 2011 = ₹ 3,45,600

Add: Depreciation ₹ 81,000

Loss on sale of assets ₹ 90,000 = ₹ 1,71,000

Total = ₹ 5,16,600

Fund Flow Statement

	₹		₹
Fund from operation	5,16,600	Increase in WC	3,10,000
Sales of fixed assets	<u>90,000</u>	Pur. of investment	<u>2,96,600</u>
	<u>6,06,600</u>		<u>6,06,600</u>

Schedule of Changing Working Capital

	31 March 2010	31 March 2011	Increase (+)	Decrease (-)
A. Current Assets	₹	₹	₹	₹
Stock	4,00,000	5,20,000	1,20,000	
Sundry debtors	3,00,000	4,95,000	1,95,000	
Cash at bank	3,00,000	3,10,000	10,000	
	<u>10,00,000</u>	<u>13,25,000</u>		
B. Current Liabilities				
Bank overdraft	1,00,000	-	1,00,000	
Sundry creditors	3,00,000	4,15,000		1,15,000
	<u>4,00,000</u>	<u>4,15,000</u>		
Working capital	6,00,000	9,10,000	-	
Increase in working capital	<u>3,10,000</u>			<u>3,10,000</u>
	<u>9,10,000</u>	<u>9,10,000</u>	<u>4,25,000</u>	<u>4,25,000</u>

3 (a) (i) Financial leverage

Combined Leverage = Operating Leverage (OL) × Financial Leverage (FL)

$$2.8 = 1.4 \times FL$$

$$FL = 2$$

Financial Leverage = 2

(ii) P/V Ratio and EPS

$$\text{P/V ratio} = \frac{C}{S} \times 100$$

$$\text{Operating leverage} = \frac{C}{C - F} \times 100$$

$$1.4 = \frac{C}{C - 2,04,000}$$

$$1.4 (C - 2,04,000) = C$$

$$1.4 C - 2,85,600 = C$$

$$C = \frac{2,85,600}{0.4}$$

$$C = 7,14,000$$

$$P/V = \frac{7,14,000}{30,00,000} \times 100 = 23.8\%$$

Therefore, P/V Ratio = 23.8%

$$EPS = \frac{\text{Profit after tax}}{\text{No. of equity shares}}$$

$$EBT = \text{Sales} - V - FC - \text{Interest}$$

$$= 30,00,000 - 22,86,000 - 2,04,000 - 2,55,000$$

$$= 2,55,000$$

$$PAT = EBT - \text{Tax}$$

$$= 2,55,000 - 76,500 = 1,78,500$$

$$EPS = \frac{1,78,500}{1,70,000} = 1.05$$

(iii) Assets turnover

$$\text{Assets turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{30,00,000}{38,25,000} = 0.784$$

0.784 < 1.5 means lower than industry turnover.

- (iv)** EBT zero means 100% reduction in EBT. Since combined leverage is 2.8, sales have to be dropped by $100/2.8 = 35.71\%$. Hence new sales will be

$$30,00,000 \times (100 - 35.71) = 19,28,700.$$

Therefore, at 19,28,700 level of sales, the Earnings before Tax of the company will be equal to zero.

(b)

Project	Outflow ₹ 2,00,000				
Year	1	2	3	4	5
	₹	₹	₹	₹	₹
Profit after depreciation but before tax	85,000	1,00,000	80,000	80,000	40,000
Tax (30 %)	25,500	30,000	24,000	24,000	12,000
PAT	59,500	70,000	56,000	56,000	28,000
Add: Dep	40,000	40,000	40,000	40,000	40,000
Net cash inflow	99,500	1,10,000	96,000	96,000	68,000

Average = ₹53,900

Average = ₹93,900.

Average = ₹93,900

(i) **Calculation of pay back period** 1.91 years

(ii) **Calculation of ARR**

Initial investment	2,00,000	1,60,000	1,20,000	80,000	40,000
Depreciation	40,000	40,000	40,000	40,000	40,000
Closing investment	1,60,000	1,20,000	80,000	40,000	0
Average investment	1,80,000	1,40,000	1,00,000	60,000	20,000

Average =1,00,000

ARR = Average of profit after tax / Average investment = 53.90%

(iii) **Calculation of net present Value** 10%

Net cash inflow	99,500.00	1,10,000.00	96,000.00	96,000.00	68,000.00
	0.909	0.826	0.751	0.683	0.621
Present value	90,445.50	90,860.00	72,096.00	65,568.00	42,228.00
Net present value	= ₹ 3,61,197.50 – ₹ 2,00,000 = ₹ 1,61,197.50				
Net present value index	= ₹ 1,61,197.50 / ₹ 2,00,000 = 0.81				

(iv) **Calculation of IRR**

Present value factor-Initial investment / Average annual cash inflow

2,00,000 / 93,900 = 2.13

It lies in between 38 % and 40%

Net Inflows	Cash	99,500.00	1,10,000.00	96,000.00	96,000.00	68,000.00	
Present Value Factor @ 38%		0.725	0.525	0.381	0.276	0.200	
Present value @ 38% (P1)		72,137.50	57,750.00	36,576.00	26,496.00	13,600.00	Total = 2,06,559.50
Net Inflows	Cash	99,500.00	1,10,000.00	96,000.00	96,000.00	68,000.00	
Present Value Factor @ 40%		0.714	0.510	0.364	0.260	0.186	
Present value @ 40% (P2)		71,043	56,100	34,944	24,960	12,648	Total = 1,99,695

IRR is calculated by Interpolation:

$$\begin{aligned}
 \text{IRR} &= \text{LDR} + (\text{P1} - \text{Q}) / \text{P1} - \text{P2} (\text{SDR} - \text{LDR}) \\
 &= 38 + (2,06,559.50 - 2,00,000) / (2,06,559.50 - 1,99,695) \times (40 - 38) \\
 &= 39.911137\%
 \end{aligned}$$

4 (a)
$$\text{FVA} = A \times \frac{(1+i)^n - 1}{i}$$

$$4,000 \times \frac{(1+.10)^4 - 1}{.10}$$

$$4,000 \times 4.641 = ₹ 18,564$$

Future Value of Annuity at the end of 4 years = ₹ 18,564

(b) Calculation of Fixed Assets and Proprietor's Fund

Since Ratio of Fixed Assets to Proprietor's Fund = 0.75

Therefore, Fixed Assets = 0.75 Proprietor's Fund

Net Working Capital = 0.25 Proprietor's Fund

6,00,000 = 0.25 Proprietor's Fund

Therefore, Proprietor's Fund = $\frac{\text{Rs. 6,00,000}}{0.25}$

= ₹ 24,00,000

Proprietor's Fund = ₹ 24,00,000

Since, Fixed Assets	=	0.75 Proprietor's Fund
Therefore, Fixed Assets	=	$0.75 \times 24,00,000$
	=	₹18,00,000
Fixed Assets	=	₹ 18,00,000

(c) Calculation of Cost of Equity

Calculation of value of firm (V) = $\frac{\text{EBIT}}{\text{Overall cost of capital (K}_o\text{)}}$

$$= \frac{9,00,000}{0.12} = \text{Rs. } 75,00,000$$

Market value of equity (S) = V – Debts

$$= 75,00,000 - 30,00,000 = ₹ 45,00,000$$

Market value of debts (D) = 30,00,000

$$K_e (\text{Cost of equity}) = K_o \frac{V}{V+D} - K_d \frac{D}{V+D}$$

$$= 0.12 \frac{₹75,00,000}{₹45,00,000 + ₹30,00,000} - 0.10 \frac{₹30,00,000}{₹45,00,000 + ₹30,00,000}$$

$$= 0.20 - 0.067 = 0.133 \times 100$$

$$K_e = 13.3\%$$