PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I: COST ACCOUNTING

QUESTIONS

Material

1. JP Limited, manufacturers of a special product, follows the policy of EOQ (Economic Order Quantity) for one of its components. The component's details are as follows:

	(₹)
Purchase Price Per Component	200
Cost of an Order	100
Annual Cost of Carrying one Unit in Inventory	10% of Purchase Price
Total Cost of Inventory and Ordering Per Annum	4,000

The company has been offered a discount of 2% on the price of the component provided the lot size is 2,000 components at a time.

You are required to:

(a) Compute the EOQ

(b) Advise whether the quantity discount offer can be accepted.

(c) Would your advice differ if the company is offered 5% discount on a single order?

(Assume that the inventory carrying cost does not vary according to discount policy)

Labour

2. Jyoti Ltd. wants to ascertain the profit lost during the year 2014-15 due to increased labour turnover. For this purpose, they have given you the following information:

(1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.

(2) 20% of the output during training period was defective. Cost of rectification of a defective unit was ₹ 25.

(3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.

(4) Selling price per unit is ₹ 180 and P/V ratio is 20%.

(5) Settlement cost of the workers leaving the organization was ₹ 1,83,480.

(6) Recruitment cost was ₹ 1,56,340

(7) Training cost was ₹ 1,13,180

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You are required to calculate the profit lost by the company due to increased labour turnover during the year 2014-15.

Overheads

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

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

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

Required:

(i) Computation of percentage recovery rates of factory overheads and administrative overheads.

(ii) Calculation of the amount of factory overheads, administrative overheads and profit for each of the two jobs.

(iii) Using the above recovery rates, fix the selling price of job 103. The additional data being.

Direct Materials	₹ 24,000
Direct Wages	₹ 20,000
Profit Percentage on Selling Price	12-1/2%

Non- Integrated Accounts

4. A manufacturing company disclosed a net loss of ₹ 3,47,000 as per their Cost Accounts for the year ended March 31, 2016. 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.

	(₹)
(i) Factory Overheads under-absorbed	40,000
(ii) Administration Overheads over-absorbed	60,000
(iii) Depreciation charged in Financial Accounts	3,25,000
(iv) Depreciation charged in Cost Accounts	2,75,000

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(v) Interest on investments not included in Cost Accounts	96,000
(vi) Income-tax provided	54,000
(vii) Interest on loan funds in Financial Accounts	2,45,000
(viii) Transfer fees (credit in financial books)	24,000
(ix) Stores adjustment (credit in financial books)	14,000
(x) Dividend received	32,000

Prepare a memorandum Reconciliation Account.

Operating Costing

5. JRP Resorts (P) Ltd. offers three types of rooms to its guests, viz Deluxe room, Super Deluxe room and Luxury Suite. You are required to ascertain the tariff to be charged to the customers for different types of rooms on the basis of following information:

Type of Room	Number of Rooms	Occupancy
Deluxe Room	100	90%
Super Deluxe Room	60	75%
Luxury Suite	40	60%

Rent of 'Super Deluxe' room is to be fixed at 2 times of 'Deluxe room' and that of 'Luxury Suite' is 3 times of 'Deluxe room'. Annual expenses are as follows:

Particulars	Amount (₹in lakhs)
Staff salaries	680.00
Lighting, Heating and Power	300.00
Repairs, Maintenance and Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior decoration	75.00
Sundries	30.28

An attendant for each room was provided when the room was occupied and he was paid ₹ 500 per day towards wages. Further, depreciation is to be provided on building @ 5% on ₹ 900 lakhs, furniture and fixtures @ 10% on ₹ 90 lakhs and air conditioners @ 10% on ₹ 75 lakhs.

Profit is to be provided @ 25% on total taking and assume 360 days in a year.

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Process Costing

6. From the following Information for the month ending October, 2015, prepare Process Cost accounts for Process III. Use First-in-fist-out (FIFO) method to value equivalent production.

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

Degree of completion:

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

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

Joint Products and By Products

7. A company processes a raw material in its Department 1 to produce three products, viz. A, B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in Department 1 at a total cost of ₹ 12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively. A and B were further processed in Department 2 at a cost of ₹ 1,80,000 and ₹ 1,50,000 respectively.

X was further processed in Department 3 at a cost of ₹1,08,000. There is no waste in further processing. The details of sales affected during the period were as under:

	A	B	X
Quantity Sold (kgs.)	17,000	5,000	44,000
Sales Value (₹)	12,24,000	2,50,000	7,92,000

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been ₹ 50, ₹ 40 and ₹ 10 per kg respectively. Required:

(i) Prepare a statement showing the apportionment of joint costs to A, B and X.

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(ii) Present a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.

(iii) Prepare a statement showing the product wise and total profit for the period.

(iv) State with supporting calculations as to whether any or all the products should be further processed or not

Contract Costing

8. A contractor commenced a building contract on October 1, 2013. The contract price is ₹ 4,40,000. The following data pertaining to the contract for the year 2014-15 has been compiled from his books and is as under:

		(₹)
April, 2014	Work-in-progress not certified	55,000
	Materials at site	2,000
2014-15	Expenses incurred:	
	Materials issued	1,12,000
	Wages paid	1,08,000
	Hire of plant	20,000
	Other expenses	34,000
March 31, 2015	Materials at site	4,000
	Work-in-progress: Not certified	8,000
	Work-in-progress: Certified	4,05,000

The cash received represents 80% of work certified. It has been estimated that further costs to complete the contract will be ₹23,000 including the materials at site as on March 31, 2015.

Required

Determine the profit on the contract for the year 2014-15 on prudent basis, which has to be credited to Costing P/L A/c.

Standard Costing

9. The following information has been provided by a company:

Number of units produced and sold	6,000
Standard labour rate per hour	₹ 8
Standard hours required for 6,000 units	-
Actual hours required	17,094 hours

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Labour efficiency	105.3%
Labour rate variance	₹ 68,376 (A)

You are required to calculate:

(i) Actual labour rate per hour

(ii) Standard hours required for 6,000 units

(iii) Labour Efficiency variance

(iv) Standard labour cost per unit

(v) Actual labour cost per unit.

Marginal Costing

10. You are given the following data for the year 2015 of Rio Co. Ltd:

Variable cost	60,000	60%
Fixed cost	30,000	30%
Net profit	10,000	10%
Sales	1,00,000	100%

Find out (a) Break-even point, (b) P/V ratio, and (c) Margin of safety. Also draw a break-even chart showing contribution and profit.

SUGGESTED HINTS/ANSWERS

1. (a) Computation of EOQ

(i)	Purchase price per component (C_1)	₹ 200
(ii)	Cost of an order (C_0)	₹ 100
(iii)	Annual cost of carrying one unit of inventory is ($i \times C_1$)	10% of C_1 or ₹ 20
(iv)	Total cost of carrying inventory and ordering per annum	₹ 4,000

(v) Let the total annual inventory usage be S.

To compute E.O.Q. by using the above data we require the figure of total annual usage of inventory. This can be determined by making use of the following relation.

$\sqrt{2SC_0iC_1}$ = ₹ 4,000

Or, $\sqrt{2S \times ₹100 \times ₹20}$ = ₹ 4,000

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Or, $\sqrt{4,000S}$ = ₹ 4,000

Squaring both side

Or, 4,000S = 4,000 × 4,000 Or, S = 4,000 units

Now

E.O.Q. = $\sqrt{\frac{2SC_0}{iC_1}} = \sqrt{\frac{2\times 4,000 \times ₹100}{₹20}}$ = 200 units

Alternatively, EOQ can also be calculated as below:

Lets EOQ is 'Q', then average holding inventories are $\frac{Q}{2}$ and annual carrying cost is $\frac{Q}{2}\times ₹20 = 10Q$

Now at EOQ level carrying cost and ordering cost is equal i.e. ₹ 2,000 each.

So, 10Q = ₹ 2,000 and Q = $\frac{₹2,000}{10}$ = 200

Hence, EOQ = 200 units

Note: Different logical notations can be used to express variables in the formula.

(b) When order size is 2,000 units

No. of orders	= $\frac{4,000\text{units}}{2,000\text{units}}$ = 2
Total cost	= Ordering Cost + Carrying Cost
	= 2× ₹ 100 + 1/2 × 2,000 units × ₹ 20
	= ₹ 200 + ₹ 20,000 = ₹ 20,200
∴ Extra cost = ₹ 20,200 – ₹ 4,000	= ₹ 16,200
Quantity discount received	= 2% × 4,000 units × ₹ 200
	= ₹ 16,000

Advice to Management: The quantity discount offer should not be accepted as it results in additional expenditure of ₹ 200 (₹ 16,200 – ₹ 16,000)

(c) When order size is 4,000 units

No. of orders	= $\frac{4,000\text{units}}{4,000\text{units}}$ = 1
Total cost	= 1 × ₹ 100 + 1/2 × 4,000 units × ₹ 20 = ₹ 40,100

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∴ Extra cost = ₹ 40,100 – ₹ 4,000 = ₹ 36,100

Quantity discount received = 5% × 4,000 units × ₹ 200

= ₹ 40,000

Advice to Management: The quantity discount offer should be accepted as it result in reducing the total cost of carrying and ordering of inventory to the extent of ₹ 3,900 [₹ 40,000 – ₹ 36,100].

Note: White solving this problem, total cost of inventory and ordering cost per annum, has been considered as total cost of carrying inventory and ordering per annum.

2. Output by experienced workers in 50,000 hours = $\frac{50,000}{10}$ = 5,000 units

∴ Output by new recruits = 60% of 5,000 = 3,000 units

Loss of output = 5,000 – 3,000 = 2,000 units

Total loss of output = Due to delay recruitment + Due to inexperience

= 10,000 + 2,000 = 12,000 units

Contribution per unit = 20% of ₹180 = ₹ 36

Total contribution lost = ₹36 × 12,000 units = ₹ 4,32,000

Cost of repairing defective units = 3,000 units × 0.2 × ₹ 25 = ₹ 15,000

Profit forgone due to labour turnover

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2014-15	9,00,000

3. (i) Let factory overhead recovery rate, as percentage of direct wages be F and administrative overheads recovery rate, as percentage of factory cost be A.

Factory Cost of Jobs:

Job 101 = ₹ 96,000 + ₹ 42,000F

Job 102 = ₹ 67,500 + ₹ 30,000F

Total Cost of Production of Jobs:

Job 101 = (₹ 96,000 + ₹ 42,000F) + (₹ 96,000 + ₹ 42,000 F) A= ₹ 1,51,500.....(i)

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Job 102 = (₹ 67,500 + ₹ 30,000F) + (₹ 67,500 + ₹ 30,000 F) A = ₹ 1,06,875.....(ii)

(Refer to Working Note)

42,000 F + 96,000 A + 42,000 FA = 55,500.....(iii) × 5

30,000 F + 67,500 A + 30,000 FA = 39,375.....(iv) × 7

On solving above relations

2,10,000 F + 4,80,000 A + 2,10,000 FA = 2,77,500

2,10,000 F + 4,72,500 A + 2,10,000 FA = 2,75,625

7,500 A = 1,875

A = 0.25

Putting the value of 'A' in equation no. (iv) above to get the value of 'F'

30,000 F + 67,500 × 0.25 + 30,000 × 0.25 F = 39,375

37,500 F = 39,375 – 16,875 or, F = 0.60

Hence percentage recovery rates of factory overheads and administrative overheads are 60% and 25% respectively.

Working Note:

	Job 101	Job 102
Total cost of production (₹)	1,51,500	1,06,875
$\frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$	(₹ 1,66,650/110%)	(₹ 1,28,250/120%)

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

	Job 101 (₹)	Job 102 (₹)
Direct Materials	54,000	37,500
Direct Wages	42,000	30,000
Prime Cost	96,000	67,500
Factory Overheads (60% of Direct Wages*)	25,200	18,000
Factory Cost	1,21,200	85,500
Administrative Overheads (25% of Factory Cost*)	30,300	21,375
Total Cost	1,51,500	1,06,857
Profit (difference figure)	15,150	21,375
Selling Price	1,66,650	1,28,250

* As calculated in requirement (i) above.

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(iii) Selling price of Job 103

	(₹)
Direct Materials	24,000
Direct Wages	20,000
Prime Cost	44,000
Factory overheads (60% of Direct Wages*)	12,000
Factory Cost	56,000
Administrative Overheads (25% of Factory Cost*)	14,000
Total Cost	70,000
Profit Margin (difference figure)	10,000
Selling Price $\left[\frac{\text{Total cost}}{87.5\%}\right]$	80,000

* As calculated in requirement (i) above.

4. Memorandum Reconciliation Account

Dr. **Cr.**

	(₹)		(₹)
To Net Loss as per Costing books	3,47,000	By Administration overheads over recovered in cost accounts	60,000
To Factory overheads under absorbed in Cost Accounts	40,000	By Interest on investment not included in Cost Accounts	96,000
To Depreciation under charged in Cost Accounts	50,000	By Transfer fees in Financial books	24,000
To Income-Tax not provided in Cost Accounts	54,000	By Stores adjustment (Credit in financial books)	14,000
To Interest on Loan Funds in Financial Accounts	2,45,000	By Dividend received in financial books	32,000
		By Net loss as per Financial books	5,10,000
	7,36,000		7,36,000

5. Operating cost statement of JRP Resort (P) Limited

Particulars	Cost per annum (₹ in lakhs)
Staff Salaries	680.00
Lighting, Heating & Power	300.00

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Repairs, Maintenance & Renovation	180.00
Linen	30.00
Laundry charges	24.00
Interior Decoration	75.00
Sundries	30.28
Room Attendant's Wages (Working Note 3)	286.20
Depreciation (Working Note 4)	61.50
Total cost for the year	1666.98

Computation of profit:

Let ₹ x be the rent for Deluxe room.

Equivalent deluxe room days are 90,720 (Working Note 2)

Total takings = ₹ 90,720x

Profit is 25% of total takings.

Profit = 25% of ₹ 90,720x = ₹ 22,680x

Total takings = Total Cost + Profit

₹ 90,720x = ₹ 16,66,98,000 + ₹ 22,680x

₹ 90,720x - ₹ 22,680x = ₹ 16,66,98,000

₹ 68,040x = ₹ 16,66,98,000

$$X = \frac{₹\,16,66,98,000}{₹\,68,040} = ₹\,2,450$$

Rent to be charged for Deluxe room	₹ 2,450
Rent to be charged for Super Deluxe room (₹ 2,450 × 2)	₹ 4,900
Rent to be charged for Luxury Suite (₹ 2,450 × 3)	₹ 7,350

Working Notes:

1. Computation of Room Occupancy

Type of Room	No. of rooms × No. of days × Occupancy %	Room days
Deluxe Room	100 rooms × 360 days × 90% occupancy	32,400
Super Deluxe Room	60 rooms × 360 days × 75% occupancy	16,200
Luxury Suite	40 rooms × 360 days × 60% occupancy	8,640
	Total	57,240

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2. Computation of equivalent Deluxe room days

Rent of 'Super Deluxe' room is to be fixed at 2 times of 'Deluxe room' and Luxury Suite' is 3 times of 'Deluxe room'. Therefore equivalent room days would be:

Type of Room	Room days	Equivalent Deluxe room days
Deluxe Room	32,400 × 1	32,400
Super Deluxe Room	16,200 × 2	32,400
Luxury Suite	8,640 × 3	25,920
	Total	90,720

3. Computation of room attendant's wages

Room occupancy days × ₹ 500 per day

57,240 room-days × ₹500 = ₹ 2,86,20,000

4. Computation of Depreciation per annum

Particulars	Cost (₹)	Rate of Depreciation	Depreciation (₹)
Building	900,00,000	5%	45,00,000
Furniture & Fixtures	90,00,000	10%	9,00,000
Air Conditioners	75,00,000	10%	7,50,000
			61,50,000

6. Statement of Equivalent Production

Input		Output		Equivalent production					
Item	Units	Item	Units	Material A		Material B		Lab.& OHs.	
				Units	%	Units	%	Units	%
Op stock	2,000	Work on op WIP	2,000	-	-	400	20	800	40
Process II transfer	53,000	Introduced & completed during the period (48,000 – 2000)	46,000	46,000	100	46,000	100	46,000	100
			48,000						
		Normal Loss (2,000,+,53,000 – 5,000) x 5%	2,500	-	-	-	-	-	-

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		Closing WIP	5,000	5,000	100	3,500	70	2,500	50
			55,500	51,000		49,900		49,300	
		Abnormal Gain	500	500	100	500	100	500	100
	55,000		55,000	50,500		49,400		48,800	

*Material A represents transfer-in units from Process-II

Statement of Cost for each Element

Element of cost	Cost (₹)	Equivalent Production	Cost per unit (₹)
Material A			
- Transferred from Process-II	4,11,500		
- Less: Scrap realisation (2,500 × ₹ 3)	(7,500)		
	4,04,000	50,500	8.00
Material B	1,97,600	49,400	4.00
Wages	97,600	48,800	2.00
Overheads	48,800	48,800	1.00
	7,48,000		15.00

Process Cost Sheet (in ₹)

Opening W-I-P:	
- Material B (400 × ₹ 4)	1,600
- Wages (800 × ₹ 2)	1,600
- Overheads (800 × ₹1)	800
	4,000
Introduced and completely processed during the period (46,000 × ₹ 15)	6,90,000
Closing W-I-P:	
Material A (5,000 × ₹ 8)	40,000
Material B (3,500 × ₹ 4)	14,000
Wages (2,500 × ₹ 2)	5,000
Overheads (2,500 × ₹ 1)	2,500
	61,500
Abnormal Gain (500 × ₹ 15)	7,500

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Process III A/c

	Units	Amount		Units	Amount
To Balance b/d	2,000	25,750	By Normal Loss	2,500	7,500
To Process II A/c	53,000	4,11,500	By Process IV A/c (6,90,000 + 4,000+ 25,750)	48,000	7,19,750
To Direct Material		1,97,600	By Bal c/d	5,000	61,500
To Direct Wages		97,600			
To Prodn OHs		48,800			
To Abnormal Gain	500	7,500			
	55,500	7,88,750		55,500	7,88,750

7. (i) Statement showing the apportionment of joint costs to A, B and X

Products	A	B	X	Total
Output (kg)	18,000	10,000	54,000	
Sales value at the point of split off (₹)	9,00,000 (₹ 50 x 18,000)	4,00,000 (₹ 40 x 10,000)	5,40,000 (₹ 10 x 54,000)	18,40,000
Joint cost apportionment on the basis of sales value at the point of split off (₹)	6,30,000 $\left(\frac{₹12,88,000}{₹18,40,000} \times ₹9,00,000\right)$	2,80,000 $\left(\frac{₹12,88,000}{₹18,40,000} \times ₹4,00,000\right)$	3,78,000 $\left(\frac{₹12,88,000}{₹18,40,000} \times ₹5,40,000\right)$	12,88,000

(ii) Statement showing the cost per kg. of each product (indicating joint cost; further processing cost and total cost separately)

Products	A	B	X
Joint costs apportioned (₹) : (I)	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000
Joint cost per kg (₹): (I ÷ II)	35	28	7
Further processing Cost per kg. (₹)	10 $\left(\frac{₹1,80,000}{18,000\,kg}\right)$	15 $\left(\frac{₹1,50,000}{10,000\,kg}\right)$	2 $\left(\frac{₹1,08,000}{54,000\,kg}\right)$
Total cost per kg (₹)	45	43	9

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(iii) Statement showing the product wise and total profit for the period

Products	A	B	X	Total
Sales value (₹)	12,24,000	2,50,000	7,92,000	
Add: Closing stock value (₹) (Refer to Working note 2)	45,000	2,15,000	90,000	
Value of production (₹)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (₹)	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (₹)	1,80,000	1,50,000	1,08,000	
Total cost (₹)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (₹)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

Products	A	B	X
Sales value (₹)	12,24,000	2,50,000	7,92,000
Quantity sold (Kgs.)	17,000	5,000	44,000
Selling price ₹/kg	72 $\left(\frac{₹\,12,24,000}{17,000\,kg}\right)$	50 $\left(\frac{₹\,2,50,000}{5,000\,kg}\right)$	18 $\left(\frac{₹\,7,92,000}{44,000\,kg}\right)$

2. Valuation of closing stock:

Since the selling price per kg of products A, B and X is more than their total costs, therefore closing stock will be valued at cost.

Products	A	B	X	Total
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (₹)	45	43	9	
Closing stock value (₹)	45,000 (₹ 45 x 1,000 kg)	2,15,000 (₹ 43 x 5,000 kg)	90,000 (₹9x10,000 kg)	3,50,000

(iv) Calculations for processing decision

Products	A	B	X
Selling price per kg at the point of split off (₹)	50	40	10
Selling price per kg after further processing (₹) (Refer to working Note 1)	72	50	18

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Incremental selling price per kg (₹)	22	10	8
Less: Further processing cost per kg (₹)	(10)	(15)	(2)
Incremental profit (loss) per kg (₹)	12	(5)	6

Product A and X has an incremental profit per unit after further processing, hence, these two products may be further processed. However, further processing of product B is not profitable hence, product B shall be sold at split off point.

8.

Contract Account
For the year 2014-15

Dr. Cr.

Particulars	(₹)	Particulars	(₹)
01.04.14			
To Work in-progress (not certified)	55,000	By Materials at site	4,000
To Materials at site	2,000		
2014-15			
To Materials issued	1,12,000	By Cost of contract	3,27,000
To Wages paid	1,08,000	c/d (to date)	
To Hire of plant	20,000		
To Other expenses	34,000		
	3,31,000		3,31,000
31.03.15			
To Cost of contract b/d (to date)	3,27,000	By Work-certified	4,05,000
To Costing Profit & Loss A/c	66,273	By Work-not certified	8,000
To Profit in reserve	19,727		
	4,13,000		4,13,000

Profit for the year 2014-15

= ₹ 4,13,000 – ₹ 3,27,000 = ₹ 86,000

Estimated profit (on the completion of the contract)

	(₹)
Cost of the contract (to date)	3,27,000
Further cost of completing the contract	23,000
Total cost : (A)	3,50,000
Contract price: (B)	4,40,000

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Estimated profit on the completion of contract: [(A)–(B)] ₹ 90,000

$$\text{Since } \left(\frac{\text{Work certified}}{\text{Contract price}}\right) \times 100 = \frac{₹\ 4,05,000}{₹\ 4,40,000} \times 100 = 92.05\%$$

This implies that contract is nearing completion. Hence the profit to be taken to Costing Profit and Loss Account on prudent basis will be given by the formula:

$$= \text{Estimated profit} \times \frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$= ₹\ 90,000 \times \frac{₹\ 4,05,000}{₹\ 4,40,000} \times \frac{₹\ 3,24,000}{₹\ 4,05,000}$$

= ₹ 66,273

9. SR – Standard labour Rate per Hour

AR – Actual labour rate per hour

SH – Standard Hours

AH – Actual hours

(i) Actual labour rate per hour:

Labour rate Variance = AH (SR – AR)

= 17,094 (₹8 – AR) = 68,376 (A) = - 68,376

= ₹ 8 – AR = - 4

Or, AR = ₹ 12

(ii) Standard hour required for 6,000 units:

$$\text{Labour Efficiency} = \frac{SH}{AH} \times 100 = 105.3$$

$$= SH = \frac{AH \times 105.3}{100} = \frac{17,094\ \text{hours} \times 105.3}{100}$$

= 17,999.982 or, SH = 18,000 hours

(iii) Labour Efficiency Variance = SR (SH – AH)

= ₹ 8(18,000 – 17,094)

= 8 × 906 = ₹ 7,248 (F)

$$\text{(iv) Standard Labour Cost per Unit} = \frac{18,000\ \text{hours} \times ₹\ 8}{6,000\ \text{units}} = ₹\ 24$$

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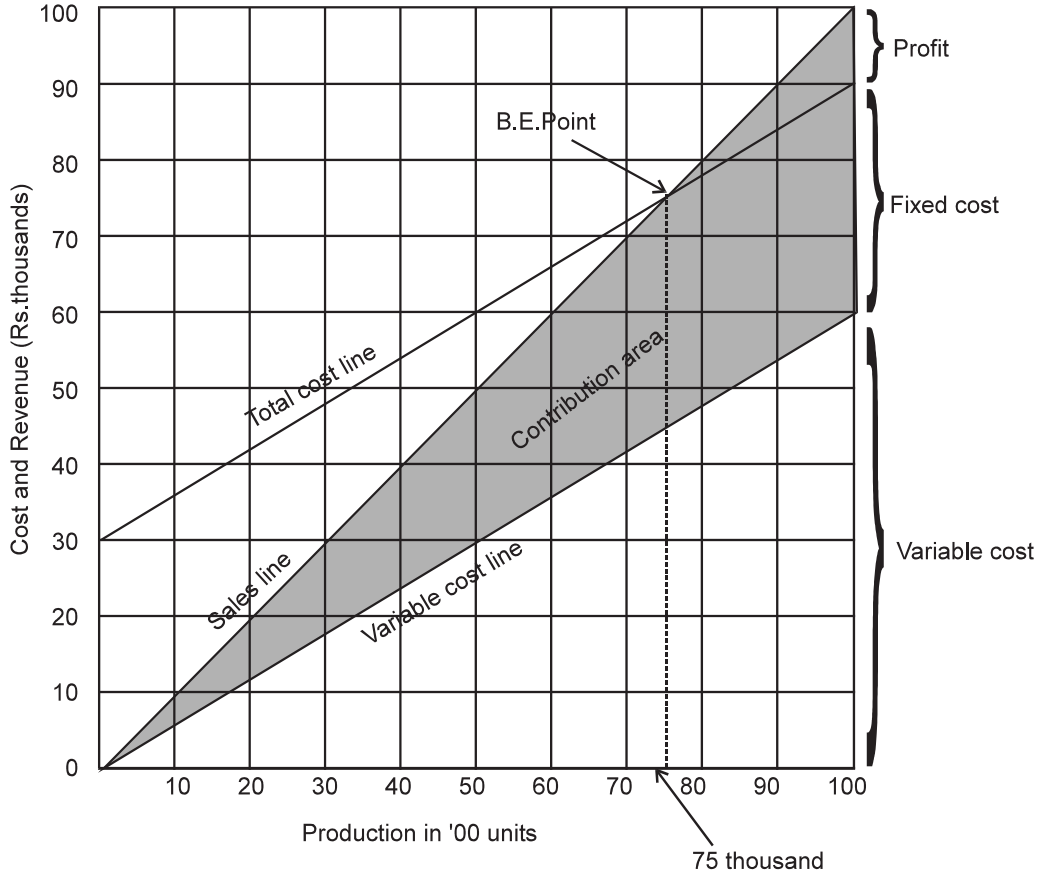
(v) Actual Labour Cost per Unit $= \frac{17{,}094 \text{ hours} \times ₹ 12}{6{,}000 \text{ units}} = ₹ 34.19$

10. P/V Ratio $= \frac{S - V}{S} = \frac{₹1{,}00{,}000 - ₹ 60{,}000}{₹1{,}00{,}000} \times 100 = 40\%$

BE point $= \frac{F}{P/V \text{ ratio}} = \frac{30{,}000}{40\%} = ₹ 75{,}000$

Margin of safety = Actual Sales – BE point= 1,00,000 – 75,000 = ₹ 25,000

Break even chart showing contribution is shown below:



Break-even chart

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PART II: FINANCIAL MANAGEMENT

QUESTIONS

Time Value of Money

1. Calculate if ₹10,000 is invested at interest rate of 12% per annum, what is the amount after 3 years if the compounding of interest is done?

   (i) Annually

   (ii) Semi-annually

   (iii) Quarterly

Fund Flow Statement

2. ABC Ltd. has supplied the following information at the beginning and at the end of the year 2015-16:

	1.4.2015 (₹)	31.3.2016 (₹)
Plant less depreciation	95,000	2,13,000
Investment (long term)	1,98,000	4,35,000
Debentures	3,75,000	1,05,000
Equity share capital	6,00,000	6,00,000
Reserves & Surplus	3,57,000	6,15,000

Although ABC Ltd. could not provide complete Balance Sheet and Profit & Loss Account, it supplied the following further information:

(1) An interim dividend of ₹ 54,000 has been paid during the year 2015-16.

(2) The net income includes ₹ 20,000 on account of profit on sale of plant. There has been an increase of ₹ 1,40,000 in the gross value of plant after a plant having gross value of ₹ 43,500, whose written down value was ₹ 28,500, was disposed off during the year.

From the information given above, you are required to prepare a Funds Flow Statement.

Ratio Analysis

3. The following are the accounting information and financial ratios of PQR Ltd. related to the year ended 31st December, 2015:

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		2015
I	Accounting Information:	
	Gross Profit	15% of Sales
	Net profit	8% of sales
	Raw materials consumed	20% of works cost
	Direct wages	10% of works cost
	Stock of raw materials	3 months' usage
	Stock of finished goods	6% of works cost
	Debt collection period	60 days
	All sales are on credit	
II	Financial Ratios:	
	Fixed assets to sales	1 : 3
	Fixed assets to Current assets	13 : 11
	Current ratio	2 : 1
	Long-term loans to Current liabilities	2 : 1
	Capital to Reserves and Surplus	1 : 4

If value of fixed assets as on 31st December, 2014 amounted to ₹ 26 lakh, prepare a summarised Profit and Loss Account of the company for the year ended 31st December, 2015 and also the Balance Sheet as on 31st December, 2015.

Cost of Capital

4. As a financial analyst of a large electronics company, you are required to determine the weighted average cost of capital of the company using (a) book value weights and (b) market value weights. The following information is available for your perusal.

The Company's present book value capital structure is:

	(₹)
Debentures (₹ 100 per debenture)	8,00,000
Preference shares (₹ 100 per share)	2,00,000
Equity shares (₹ 10 per share)	10,00,000
	20,00,000

All these securities are traded in the capital markets. Recent prices are:

Debentures, ₹110 per debenture, Preference shares, ₹120 per share, and Equity shares, ₹ 22 per share

Anticipated external financing opportunities are:

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(i) ₹ 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, ₹ 100

(ii) ₹ 100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, ₹100.

(iii) Equity shares: ₹ 2 per share flotation costs, sale price = ₹ 22.

In addition, the dividend expected on the equity share at the end of the year is ₹ 2 per share, the anticipated growth rate in dividends is 7 per cent and the firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35 per cent.

Capital Structure

5. Akash Limited provides you the following information:

	(₹)
Profit (EBIT)	2,80,000
Less: Interest on Debenture @ 10%	40,000
EBT	2,40,000
Less Income Tax @ 50%	1,20,000
	1,20,000
No. of Equity Shares (₹ 10 each)	30,000
Earnings per share (EPS)	4
Price /EPS (PE) Ratio	10

The company has reserves and surplus of ₹ 7,00,000 and required ₹ 4,00,000 further for modernisation. Return on Capital Employed (ROCE) is constant. Debt (Debt/ Debt + Equity) Ratio higher than 40% will bring the P/E Ratio down to 8 and increase the interest rate on additional debts to 12%. You are required to ascertain the probable price of the share.

(i) If the additional capital are raised as debt; and

(ii) If the amount is raised by issuing equity shares at ruling market price.

Leverage

6. A Company had the following Balance Sheet as on March 31, 2015:

Equity and Liabilities	(₹ in crore)	Assets	(₹ in crore)
Equity Share Capital (10 crore shares of ₹ 10 each)	100	Fixed Assets (Net)	250
Reserves and Surplus	20	Current Assets	150
15% Debentures	200		

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Current Liabilities	80		
	400		400

The additional information given is as under:

Fixed Costs per annum (excluding interest)	₹ 80 crores
Variable operating costs ratio	65%
Total Assets turnover ratio	2.5
Income-tax rate	40%

Required:

Calculate the following and comment:

(i) Earnings per share

(ii) Operating Leverage

(iii) Financial Leverage

(iv) Combined Leverage.

Capital Budgeting

7. Navya Limited is thinking of replacing its existing machine by a new machine which would cost ₹ 60 lakhs. The company's current production is 80,000 units, and is expected to increase to 1,00,000 units, if the new machine is bought. The selling price of the product would remain unchanged at ₹ 200 per unit. The following is the cost of producing one unit of product using both the existing and new machine:

(Unit Cost in ₹)

	Existing Machine (80,000 units)	New Machine (1,00,000 units)	Difference
Materials	75.00	63.75	(11.25)
Wages & Salaries	51.25	37.50	(13.75)
Supervision	20.00	25.00	5.00
Repairs and Maintenance	11.25	7.50	(3.75)
Power and Fuel	15.50	14.25	(1.25)
Depreciation	0.25	5.00	4.75
Allocated Corporate Overheads	10.00	12.50	2.50
	183.25	165.50	(17.75)

The existing machine has an accounting book value of ₹ 1,00,000, and it has been fully depreciated for tax purpose. It is estimated that machine will be useful for 5 years. The supplier of the new machine has offered to accept the old machine for ₹ 2,50,000. However, the market price of old machine today is ₹ 1,50,000 and it is expected to be ₹

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35,000 after 5 years. The new machine has a life of 5 years and a salvage value of ₹ 2,50,000 at the end of its economic life. Assume corporate Income tax rate at 40%, and depreciation is charged on straight line basis for Income-tax purposes. Further assume that book profit is treated as ordinary income for tax purpose. The opportunity cost of capital of the Company is 15%.

Required:

(i) Estimate net present value of the replacement decision.

(ii) Estimate the internal rate of return of the replacement decision.

(iii) Should Company go ahead with the replacement decision? Suggest.

Year (t)	1	2	3	4	5
$PVIF_{0.15,t}$	0.8696	0.7561	0.6575	0.5718	0.4972
$PVIF_{0.20,t}$	0.8333	0.6944	0.5787	0.4823	0.4019
$PVIF_{0.25,t}$	0.8000	0.6400	0.5120	0.4096	0.3277
$PVIF_{0.30,t}$	0.7692	0.5917	0.4552	0.3501	0.2693
$PVIF_{0.35,t}$	0.7407	0.5487	0.4064	0.3011	0.2230

Working Capital Management

8. A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are ₹ 2.60 crores and ₹ 2.34 crores respectively. Estimated Sales and EBIT depend on current assets investment, particularly inventories and book-debts. The Financial Controller of the company is examining the following alternative Working Capital Policies:

(₹ in crore)

Working Capital Policy	Investment in Current Assets	Estimated Sales	EBIT
Conservative	4.50	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use ₹ 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives.

(₹ in crore)

Financing Policy	Short-term Debt	Long-term Debt
Conservative	0.54	1.12

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Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest rate-Average	12%	16%

You are required to calculate the following:

(i) Working Capital Investment for each policy:

(a) Net Working Capital position

(b) Rate of Return

(c) Current ratio

(ii) Financing for each policy:

(a) Net Working Capital position.

(b) Rate of Return on Shareholders' equity.

(c) Current ratio.

Introduction and type of financing

9. Write short notes on the following:

(a) Functions of Finance Manager.

(b) Inter relationship between investment, financing and dividend decisions.

(c) Debt securitisation

SUGGESTED HINTS/ANSWERS

1. Computation of future value

Principal (P) = ₹ 10,000

Rate of interest (i) = 12% p.a.

Time period (n) = 3 years

Amount if compounding is done:

(i) Annually

Future Value $= P(1+i)^n$

$= ₹ 10,000 (1 + 0.12)^{3\times1}$

$= ₹ 10,000 \times 1.404928$

$= ₹ 14,049.28$

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(ii) Semi Annually

$$\text{Future Value} = ₹10,000\left(1+\frac{12}{100\times 2}\right)^{3\times 2}$$

$$= ₹10,000\ (1 + 0.06)^{6}$$

$$= ₹10,000 \times 1.418519$$

$$= ₹\ 14,185.19$$

(iii) Quarterly

$$\text{Future Value} = ₹10,000\left(1+\frac{12}{100\times 4}\right)^{3\times 4}$$

$$= ₹10,000\ (1 + 0.03)^{12}$$

$$= ₹10,000 \times 1.425761$$

$$= ₹\ 14,257.61$$

2. Fund from Operation

Particulars	**(₹)**
Closing value of reserves & surplus	6,15,000
Less: Opening value of reserves & surplus	(3,57,000)
Profit after depreciation	2,58,000
Add: Depreciation (refer the working note)	37,000
Profit before depreciation	2,95,000
Less: Profit on sale of plant	(20,000)
	2,75,000
Add: Interim dividend	54,000
Fund from Operation	3,29,000

Fund flow statement for the year ended 31st March 2016

Particulars	**(₹)**
Sources of Fund	
Fund from Operation	3,29,000
Decrease in working capital (Balancing Figure)	3,67,000
Sale of plant	48,500
	7,44,500

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Application of Fund	
Long-term Investment (₹4,35,000 – ₹1,98,000)	2,37,000
Purchase of Plant (refer the working note)	1,83,500
Repayment of Debentures (₹3,75,000 – ₹1,05,000)	2,70,000
Payment of interim dividend	54,000
	7,44,500

Working Note:

Plant A/c

Particulars	**(₹)**	**Particulars**	**(₹)**
To Balance b/d	95,000	By Bank A/c (Sale)	48,500
To P&L A/c (Profit on sale)	20,000	By Prov. for Depreciation (Balancing figure)	37,000
To Bank A/c (new purchase) (₹1,40,000 + ₹43,500)	1,83,500	By Balance c/d	2,13,000
	2,98,500		2,98,500

3. (a) Working Notes:

(i) Calculation of Sales:

$$\frac{\text{Fixed Assets}}{\text{Sales}} = \frac{1}{3} \quad \text{or,} \quad \frac{₹26,00,000}{\text{Sales}} = \frac{1}{3}$$

Or, Sales = ₹ 78,00,000

(ii) Calculation of Current Assets:

$$\frac{\text{Fixed Assets}}{\text{Current Assets}} = \frac{13}{11} \text{ or, } \frac{₹26,00,000}{\text{Current Assets}} = \frac{13}{11}$$

Or, Current Assets = ₹ 22,00,000

(iii) Calculation of Raw Material Consumption and Direct Wages:

	(₹)
Sales	78,00,000
Less: Gross Profit (15% of ₹78,00,000)	11,70,000
Works Cost	66,30,000

Raw Material Consumption (20% of ₹66,30,000) = ₹ 13,26,000

Direct Wages (10% of ₹66,30,000) = ₹ 6,63,000

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(iv) Calculation of Stock of Raw Materials (3 months usage):

$$= ₹13,26,000 \times \frac{3\text{months}}{12\text{months}} = ₹\ 3,31,500$$

(v) Calculation of Stock of Finished Goods (6% of Works Cost):

= 6% of ₹ 66,30,000 = ₹ 3,97,800

(vi) Calculation of Current Liabilities:

$$\frac{\text{Current Assets}}{\text{Current Liablities}} = \frac{2}{1} \text{ or, } \frac{₹22,00,000}{\text{Current Liablities}} = \frac{2}{1}$$

Or, Current Liabilities = ₹ 11,00,000

(vii) Calculation of Debtors:

$$\text{Average collection period} = \frac{\text{Debtors}}{\text{Credit Sales}} \times 365^*$$

$$\frac{\text{Debtors}}{₹78,00,000} \times 365 \text{ days} = 60 \text{ days} \quad \text{or, Debtors} = ₹12,82,192$$

(viii) Calculation of Long term Loan:

$$\frac{\text{Long term Loan}}{\text{Current Liabilitie s}} = \frac{2}{1} \quad \text{or, } \frac{\text{Long} - \text{term loan}}{₹11,00,000} = \frac{2}{1}$$

Or, Long-term loan = ₹ 22,00,000

(ix) Calculation of Cash Balance:

		(₹)
Current assets		22,00,000
Less: Debtors	12,82,192	
Raw materials stock	3,31,500	
Finished goods stock	3,97,800	(20,11,492)
Cash balance		1,88,508

(x) Calculation of Net worth:

Fixed Assets	26,00,000
Current Assets	22,00,000
Total Assets	48,00,000

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Less: Long term Loan	22,00,000	
Current Liabilities	11,00,000	(33,00,000)
Net worth		15,00,000

Net worth = Share capital + Reserves and Surplus = ₹ 15, 00,000

$\frac{\text{Share Capital}}{\text{Reserve and Surplus}} = \frac{1}{4}$ or, Share Capital = 15,00,000 × $\frac{1}{5}$ = ₹ 3,00,000

Reserves and Surplus = 15,00,000 × $\frac{4}{5}$ = ₹ 12,00,000

Profit and Loss Account of PQR Ltd. for the year ended 31st December, 2015

Particulars	(₹)	Particulars	(₹)
To Direct Materials	13,26,000	By Sales	78,00,000
To Direct Wages	6,63,000		
To Works (Overhead) Balancing figure	46,41,000		
To Gross Profit c/d (15% of Sales)	11,70,000		
	78,00,000		78,00,000
To Operating and Selling & Distribution Expenses (Balancing figure)	5,46,000	By Gross Profit b/d	11,70,000
To Net Profit (8% of Sales)	6,24,000		
	11,70,000		11,70,000

Balance Sheet of PQR Ltd. as at 31st December, 2015

Liabilities	(₹)	Assets	(₹)
Share Capital	3,00,000	Fixed Assets	26,00,000
Reserves and Surplus	12,00,000	Current Assets:	
Long term loans	22,00,000	Stock of Raw Material	3,31,500
Current liabilities	11,00,000	Stock of Finished Goods	3,97,800
		Debtors	12,82,192

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		Cash	1,88,508
	48,00,000		48,00,000

Note: No. of days in a year has been taken as 365. If 360 days in a year is considered then debtors will be $₹78,00,000 \times \frac{60\,days}{360\,days}$ = ₹13,00,000 and accordingly cash balance will be: [₹22,00,000 – (₹13,00,000 + ₹3,31,500 + ₹3,97,800)] = ₹1,70,700

4. Determination of specific costs:

(i) Cost Debt (K_d) = $\frac{\text{Interest}\,(1-t)+\frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{₹11(1-0.35)+\frac{(₹100-₹96)}{10\,years}}{\frac{(₹100+₹96)}{2}}$

$= \frac{₹7.15+₹0.4}{₹98} = 0.077$ or 7.70%

(ii) Cost of Preference Shares (K_p) $= \frac{PD+\frac{(RV-NP)}{N}}{\frac{(RV+NP)}{2}} = \frac{₹12+\frac{(₹100-₹95)}{10\,years}}{\frac{(₹100+₹95)}{2}}$

$= \frac{₹12+₹0.5}{₹97.5} = 0.1282$ or 12.82%

(iii) Cost of Equity shares (K_e) $= \frac{D_1}{P_0}+G = \frac{₹2}{₹22-₹2}+0.07 = 0.17$ or 17%

I – Interest, t – Tax, RV- Redeemable value, NP- Net proceeds, N- No. of years, PD- Preference dividend, D_1- Dividend at the end of the year, P_0- Price of share (net)

Using these specific costs we can calculate WACC on the basis of book value and market value weights as follows:

(a) Weighted Average Cost of Capital (K_0) based on Book value weights

Source of capital	Book value (₹)	Weights	Specific cost (%)	WACC (%)
Debentures	8,00,000	0.40	7.70	3.08
Preference shares	2,00,000	0.10	12.82	1.28

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Equity shares	10,00,000	0.50	17.00	8.50
	20,00,000	1.00		12.86

(b) Weighted Average Cost of Capital (K_0) based on market value weights:

Source of capital	Market value (₹)	Weights	Specific cost (%)	WACC (%)
Debentures $\left(\frac{₹8,00,000}{₹100}\times₹110\right)$	8,80,000	0.265	7.70	2.04
Preferences shares $\left(\frac{₹2,00,000}{₹100}\times₹120\right)$	2,40,000	0.072	12.82	0.92
Equity shares $\left(\frac{₹10,00,000}{₹10}\times₹22\right)$	22,00,000	0.663	17.00	11.27
	33,20,000	1.000		14.23

5. Ascertainment of probable price of shares of Akash limited

Particulars	Plan-I	Plan-II
	If ₹ 4,00,000 is raised as debt (₹)	If ₹ 4,00,000 is raised by issuing equity shares (₹)
Earnings Before Interest and Tax (EBIT) {20% of new capital i.e. 20% of (₹14,00,000 + ₹4,00,000)} (Refer working note1)	3,60,000	3,60,000
Less: Interest on old debentures (10% of ₹4,00,000)	(40,000)	(40,000)
Less: Interest on new debt (12% of ₹4,00,000)	(48,000)	--
Earnings Before Tax (EBT)	2,72,000	3,20,000
Less: Tax @ 50%	(1,36,000)	1,60,000
Earnings for equity shareholders (EAT)	1,36,000	1,60,000
No. of Equity Shares (refer working note 2)	30,000	40,000

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Earnings per Share (EPS)	₹ 4.53	₹ 4.00
Price/ Earnings (P/E) Ratio (refer working note 3)	8	10
Probable Price Per Share (PE Ratio × EPS)	₹ 36.24	₹ 40

Working Notes:

1. Calculation of existing Return of Capital Employed (ROCE):

	(₹)
Equity Share capital (30,000 shares × ₹10)	3,00,000
10% Debentures $\left(₹40,000 \times \frac{100}{10}\right)$	4,00,000
Reserves and Surplus	7,00,000
Total Capital Employed	14,00,000
Earnings before interest and tax (EBIT) (given)	2,80,000
ROCE = $\frac{₹2,80,000}{₹14,00,000} \times 100$	20%

2. Number of Equity Shares to be issued in Plan-II:

$= \frac{₹4,00,000}{₹40} = 10,000$ shares

Thus, after the issue total number of shares = 30,000+ 10,000 = 40,000 shares

3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:

$= \frac{₹8,00,000}{₹18,00,000} \times 100 = 44.44\%$

As the debt equity ratio is more than 40% the P/E ratio will be brought down to 8 in Plan-I

6. Total Assets = ₹ 400 crores

Asset Turnover Ratio = 2.5

Hence, Total Sales = 400 × 2.5 = ₹ 1,000 crores

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Computation of Profits after Tax (PAT)

	(₹ in crore)
Sales	1,000
Less: Variable operating cost (65% of ₹1,000 crore)	(650)
Contribution	350
Less: Fixed cost (other than Interest)	(80)
EBIT	270
Less: Interest on debentures (15% × ₹200 crore)	(30)
EBT	240
Less: Tax 40%	(96)
EAT (earnings available to equity share holders)	144

(i) Earnings per share (EPS)

$$\therefore \text{EPS} = \frac{₹\ 144 \text{ crores}}{10 \text{ crore equity shares}} = ₹\ 14.40$$

(ii) Operating Leverage

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{350}{270} = 1.296$$

It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{270}{240} = 1.125$$

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

(iv) Combined Leverage

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}$$

Or, Operating Leverage × Financial Leverage $= 1.296 \times 1.125 = 1.458$

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales.

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7. (i) Net Cash Outlay of New Machine

Purchase Price	₹ 60,00,000
Less: Exchange value of old machine	
[₹2,50,000 – 0.4 (₹2,50,000 – 0)]	1,50,000
	₹ 58,50,000

Depreciation base: Old machine has been fully depreciated for tax purpose.

Thus the depreciation base of the new machine will be its original cost i.e. ₹ 60,00,000.

Net Cash Flows: Unit cost includes depreciation and allocated overheads. Allocated overheads are allocations from corporate office therefore they are irrelevant. The depreciation tax shield may be computed separately. Excluding depreciation and allocated overheads, unit costs can be calculated. The company will obtain additional revenue from additional 20,000 units sold.

Thus, after-tax saving, excluding depreciation, tax shield, would be:

= (EBT under new machine – EBT under existing machine) × (1 - tax rate)

= {100,000 units (₹200 – ₹148*) – 80,000 units (₹200 – ₹173*)} × (1 – 0.40)

= {₹ 52,00,000 – ₹ 21,60,000} × 0.60 = ₹18,24,000

(* Excluding depreciation and allocated overheads)

After adjusting depreciation tax shield and salvage value, net cash flows and net present value are estimated.

Calculation of Cash flows and Project Profitability:

						(₹ '000)
	0	**1**	**2**	**3**	**4**	**5**
1. After-tax savings	-	1,824	1,824	1,824	1,824	1,824
2. Depreciation (₹60,00,000 - ₹ 2,50,000)/5	-	1,150	1,150	1,150	1,150	1,150
3. Tax shield on depreciation (Depreciation × Tax rate)	-	460	460	460	460	460
4. Net cash flows from operations (1+3)*	-	2,284	2,284	2,284	2,284	2,284
5. Initial cost	(5,850)					
6. Net Salvage Value (₹2,50,000 – ₹35,000)	-	-	-	-	-	215

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7. Net Cash Flows (4 + 5 + 6)	(5,850)	2,284	2,284	2,284	2,284	2,499
8. PVF at 15%	1.00	0.8696	0.7561	0.6575	0.5718	0.4972
9. PV	(5,850)	1,986.166	1,726.932	1,501.73	1,305.99	1,242.50
10. NPV	1,913.32					

* Alternately Net Cash flows from operation can be calculated as follows:

Profit before depreciation and tax:

= 1,00,000 (₹200 - ₹148) - 80,000 (₹200 - ₹173) = ₹ 52,00,000 – ₹ 21,60,000

= ₹ 30,40,000

So, Profit after depreciation and tax is:

(₹30,40,000 - ₹11,50,000) × (1 - 0.40) = ₹ 11,34,000

So, Profit before depreciation and after tax is :

₹ 11,34,000 + ₹11,50,000 (Depreciation added back) = ₹ 22,84,000

(ii)

						(₹ '000)
	0	**1**	**2**	**3**	**4**	**5**
NCF	(5,850)	2,284	2,284	2,284	2,284	2,499
PVF at 20%	1.00	0.8333	0.6944	0.5787	0.4823	0.4019
PV	(5,850)	1,903.257	1,586.01	1,321.751	1,101.57	1,004.35
PV of benefits	6,916.94					
PVF at 30%	1.00	0.7692	0.5917	0.4552	0.3501	0.2693
PV	(5,850)	1,756.85	1,351.44	1,039.22	799.63	672.98
PV of benefits	5,620.12					

$$\text{IRR} = 20\% + 10\% \times \frac{1,066.94}{1,296.82} = 28.23\%$$

(iii) Advise: The Company should go ahead with replacement project, since it is positive NPV decision.

(Note: *Market Value of Old Machine:* The old machine could be sold for ₹ 1,50,000 in the market. Since the exchange value is more than the market value, this option is not attractive. This opportunity will be lost whether the old machine is retained or replaced. Thus, on incremental basis, it has no impact.)

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8. (i) Statement showing Working Capital Investment for each policy

(₹ in crore)

	Working Capital Policy		
	Conservative	Moderate	Aggressive
Current Assets: (i)	4.50	3.90	2.60
Fixed Assets: (ii)	2.60	2.60	2.60
Total Assets: (iii)	7.10	6.50	5.20
Current liabilities: (iv)	2.34	2.34	2.34
Net Worth: (v) = (iii) - (iv)	4.76	4.16	2.86
Total liabilities: (iv) + (v)	7.10	6.50	5.20
Estimated Sales: (vi)	12.30	11.50	10.00
EBIT: (vii)	1.23	1.15	1.00
(a) Net working capital position: (i) - (iv)	2.16	1.56	0.26
(b) Rate of return: (vii) /(iii)	17.32%	17.69%	19.23%
(c) Current ratio: (i)/ (iv)	1.92	1.67	1.11

(ii) Statement Showing Effect of Alternative Financing Policy

(₹ in crore)

Financing Policy	Conservative	Moderate	Aggressive
Current Assets (i)	3.90	3.90	3.90
Fixed Assets (ii)	2.60	2.60	2.60
Total Assets (iii)	6.50	6.50	6.50
Current Liabilities (iv)	2.34	2.34	2.34
Short term Debt (v)	0.54	1.00	1.50
Total current liabilities (vi) = (iv) + (v)	2.88	3.34	3.84
Long term Debt (vii)	1.12	0.66	0.16
Equity Capital (viii)	2.50	2.50	2.50
Total liabilities (ix) = (vi)+(vii)+(viii)	6.50	6.50	6.50
Forecasted Sales	11.50	11.50	11.50
EBIT (x)	1.15	1.15	1.15
Less: Interest on short-term debt	0.06 (12% of ₹0.54)	0.12 (12% of ₹ 1)	0.18 (12% of ₹ 1.5)

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Interest on long term debt	0.18 (16% of ₹1.12)	0.11 (16% of ₹0.66)	0.03 (16% of ₹0.16)
Earnings before tax (EBT) (xi)	0.91	0.92	0.94
Taxes @ 35% (xii)	0.32	0.32	0.33
Earnings after tax: (xiii) = (xi) – (xii)	0.59	0.60	0.61
(a) Net Working Capital Position: (i) - [(iv) + (v)]	1.02	0.56	0.06
(b) Rate of return on shareholders Equity capital : (xiii)/ (viii)	23.6%	24.0%	24.4%
(c) Current Ratio (i) / (vi)	1.35	1.17	1.02

9. (a) Functions of Finance Manager

The Finance Manager's main objective is to manage funds in such a way so as to ensure their optimum utilisation and their procurement in a manner that the risk, cost and control considerations are properly balanced in a given situation. To achieve these objectives the Finance Manager performs the following functions:

(i) *Estimating the requirement of Funds:* Both for long-term purposes i.e. investment in fixed assets and for short-term i.e. for working capital. Forecasting the requirements of funds involves the use of techniques of budgetary control and long-range planning.

(ii) *Decision regarding Capital Structure:* Once the requirement of funds has been estimated, a decision regarding various sources from which these funds would be raised has to be taken. A proper balance has to be made between the loan funds and own funds. He has to ensure that he raises sufficient long term funds to finance fixed assets and other long term investments and to provide for the needs of working capital.

(iii) *Investment Decision:* The investment of funds, in a project has to be made after careful assessment of various projects through capital budgeting. Assets management policies are to be laid down regarding various items of current assets. For e.g. receivable in coordination with sales manager, inventory in coordination with production manager.

(iv) *Dividend decision:* The finance manager is concerned with the decision as to how much to retain and what portion to pay as dividend depending on the company's policy. Trend of earnings, trend of share market prices, requirement of funds for future growth, cash flow situation etc., are to be considered.

(v) *Evaluating financial performance:* A finance manager has to constantly review the financial performance of the various units of organisation generally in

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terms of ROI Such a review helps the management in seeing how the funds have been utilised in various divisions and what can be done to improve it.

(vi) *Financial negotiation:* The finance manager plays a very important role in carrying out negotiations with the financial institutions, banks and public depositors for raising of funds on favourable terms.

(vii) *Cash management:* The finance manager lays down the cash management and cash disbursement policies with a view to supply adequate funds to all units of organisation and to ensure that there is no excessive cash.

(viii) K*eeping touch with stock exchange:* Finance manager is required to analyse major trends in stock market and their impact on the price of the company share.

(b) Inter-relationship between Investment, Financing and Dividend Decisions

The finance functions are divided into three major decisions, viz., investment, financing and dividend decisions. It is correct to say that these decisions are inter-related because the underlying objective of these three decisions is the same, i.e. maximisation of shareholders' wealth. Since investment, financing and dividend decisions are all interrelated, one has to consider the joint impact of these decisions on the market price of the company's shares and these decisions should also be solved jointly. The decision to invest in a new project needs the finance for the investment. The financing decision, in turn, is influenced by and influences dividend decision because retained earnings used in internal financing deprive shareholders of their dividends. An efficient financial management can ensure optimal joint decisions. This is possible by evaluating each decision in relation to its effect on the shareholders' wealth.

The above three decisions are briefly examined below in the light of their inter-relationship and to see how they can help in maximising the shareholders' wealth i.e. market price of the company's shares.

Investment decision: The investment of long term funds is made after a careful assessment of the various projects through capital budgeting and uncertainty analysis. However, only that investment proposal is to be accepted which is expected to yield at least so much return as is adequate to meet its cost of financing. This have an influence on the profitability of the company and ultimately on its wealth.

Financing decision: Funds can be raised from various sources. Each source of funds involves different issues. The finance manager has to maintain a proper balance between long-term and short-term funds. With the total volume of long-term funds, he has to ensure a proper mix of loan funds and owner's funds. The optimum financing mix will increase return to equity shareholders and thus maximise their wealth.

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Dividend decision: The finance manager is also concerned with the decision to pay or declare dividend. He assists the top management in deciding as to what portion of the profit should be paid to the shareholders by way of dividends and what portion should be retained in the business. An optimal dividend pay-out ratio maximises shareholders' wealth.

The above discussion makes it clear that investment, financing and dividend decisions are interrelated and are to be taken jointly keeping in view their joint effect on the shareholders' wealth.

(c) Debt Securitisation: It is a method of recycling of funds. It is especially beneficial to financial intermediaries to support the lending volumes. Assets generating steady cash flows are packaged together and against this asset pool, market securities can be issued, e.g. housing finance, auto loans, and credit card receivables.

Process of Debt Securitisation

(i) *The origination function* – A borrower seeks a loan from a finance company, bank. The credit worthiness of borrower is evaluated and contract is entered into with repayment schedule structured over the life of the loan.

(ii) *The pooling function* – Similar loans on receivables are clubbed together to create an underlying pool of assets. The pool is transferred in favour of Special purpose Vehicle (SPV), which acts as a trustee for investors.

(iii) *The securitisation function* – SPV will structure and issue securities on the basis of asset pool. The securities carry a coupon and expected maturity which can be asset-based/mortgage based. These are generally sold to investors through merchant bankers. Investors are – pension funds, mutual funds, insurance funds.

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