PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I: COST ACCOUNTING

QUESTIONS

Material

1. Rounak Ltd. is the manufacturer of monitors for PCs. A monitor requires 4 units of Part-M. The following are the details of its operation during 20X8:

Average monthly market demand	2,000 Monitors
Ordering cost	₹ 1,000 per order
Inventory carrying cost	20% per annum
Cost of Part	₹ 350 per part
Normal usage	425 parts per week
Minimum usage	140 parts per week
Maximum usage	710 parts per week
Lead time to supply	3 - 5 weeks

Compute from the above:

(i) Economic Order Quantity (EOQ). If the supplier is willing to supply quarterly 30,000 units of Part-M at a discount of 5%, is it worth accepting?

(ii) Reorder level

(iii) Maximum level of stock

(iv) Minimum level of stock.

Labour

2. A job can be executed either through workman A or B. A takes 32 hours to complete the job while B finishes it in 30 hours. The standard time to finish the job is 40 hours.

The hourly wage rate is same for both the workers. In addition workman A is entitled to receive bonus according to Halsey plan (50%) sharing while B is paid bonus as per Rowan plan. The works overheads are absorbed on the job at ₹ 7.50 per labour hour worked. The factory cost of the job comes to ₹ 2,600 irrespective of the workman engaged.

Interpret the hourly wage rate and cost of raw materials input. Also show cost against each element of cost included in factory cost.

Overheads

3. Sree Ajeet Ltd. having fifteen different types of automatic machines furnishes information as under for 20X8-20X9

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(i) Overhead expenses: Factory rent ₹ 1,80,000 (Floor area 1,00,000 sq.ft.), Heat and gas ₹ 60,000 and supervision ₹ 1,50,000.

(ii) Wages of the operator are ₹ 200 per day of 8 hours . Operator attends to one machine when it is under set up and two machines while they are under operation.

In respect of machine B (one of the above machines) the following particulars are furnished:

(i) Cost of machine ₹1,80,000, Life of machine- 10 years and scrap value at the end of its life ₹ 10,000

(ii) Annual expenses on special equipment attached to the machine are estimated as ₹ 12,000

(iii) Estimated operation time of the machine is 3,600 hours while set up time is 400 hours per annum

(iv) The machine occupies 5,000 sq.ft. of floor area.

(v) Power costs ₹ 5 per hour while machine is in operation.

Estimate the comprehensive machine hour rate of machine B. Also find out machine costs to be absorbed in respect of use of machine B on the following two work orders

	Work order- 1	Work order-2
Machine set up time (Hours)	15	30
Machine operation time (Hours)	100	190

Non-Integrated Accounting

4. The financial books of a company reveal the following data for the year ended 31st March, 20X8:

Opening Stock:	(₹)
Finished goods 625 units	53,125
Work-in-process	46,000
01.04.20X7 to 31.03.20X8	
Raw materials consumed	8,40,000
Direct Labour	6,10,000
Factory overheads	4,22,000
Administration overheads (Production related)	1,98,000
Dividend paid	1,22,000
Bad Debts	18,000
Selling and Distribution Overheads	72,000

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Interest received	38,000
Rent received	46,000
Sales 12,615 units	22,80,000
Closing Stock: Finished goods 415 units	45,650
Work-in-process	41,200

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹ 3 per unit sold.
- Opening Stock of finished goods is valued at ₹ 120 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(i) Prepare a statements for the year ended 31st March, 20X8. Show
   - the profit as per financial records
   - the profit as per costing records.

(ii) Prepare a statement reconciling the profit as per costing records with the profit as per Financial Records.

Contract Costing

5. A construction company undertook a contract at an estimated price of ₹ 108 lakhs, which includes a budgeted profit of ₹ 18 lakhs. The relevant data for the year ended 31.03.20X8 are as under:

	(₹ '000)
Materials issued to site	5,000
Direct wages paid	3,800
Plant hired	700
Site office costs	270
Materials returned from site	100
Direct expenses	500
Work certified	10,000
Work not certified	230
Progress payment received	7,200

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A special plant was purchased specifically for this contract at ₹ 8,00,000 and after use on this contract till the end of 31.02.20X8, it was valued at ₹ 5,00,000. This cost of materials at site at the end of the year was estimated at ₹ 18,00,000 Direct wages accrued as on 31.03.20X8 was ₹ 1,10,000.

Required

Prepare the Contract Account for the year ended 31st March, 20X8.

Job Costing

6. A company has been asked to quote for a job. The company aims to make a net profit of 30% on sales. The estimated cost for the job is as follows:

Direct materials 10 kg @₹10 per kg

Direct labour 20 hours @ ₹5 per hour

Variable production overheads are recovered at the rate of ₹2 per labour hour.

Fixed production overheads for the company are budgeted to be ₹1,00,000 each year and are recovered on the basis of labour hours.

There are 10,000 budgeted labour hours each year. Other costs in relation to selling, distribution and administration are recovered at the rate of ₹50 per job.

Determine quote for the job by the Company.

Process Costing

7. From the following information for the month of January, 20X9, prepare Process-III cost accounts.

Opening WIP in Process-III	1,600 units at ₹ 24,000
Transfer from Process-II	55,400 units at ₹ 6,23,250
Transferred to warehouse	52,200 units
Closing WIP of Process-III	4,200 units
Units Scrapped	600 units
Direct material added in Process-III	₹ 2,12,400
Direct wages	₹ 96,420
Production overheads	₹ 56,400

Degree of completion:

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

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

(Students may treat material transferred from Process – II as Material – A and fresh material used in Process – III as Material B)

Joint Products & By Products

8. In an Oil Mill four products emerge from a refining process. The total cost of input during the quarter ending March 20X8 is ₹1,48,000. The output, sales and additional processing costs are as under:

Products	Output in Litres	Additional processing cost after split off (₹)	Sales value (₹)
ACH	8,000	43,000	1,72,500
BCH	4,000	9,000	15,000
CSH	2,000	–	6,000
DSH	4,000	1,500	45,000

In case these products were disposed-off at the split off point that is before further processing, the selling price per litre would have been:

ACH(₹)	BCH(₹)	CSH(₹)	DSH(₹)
15.00	6.00	3.00	7.50

Produce a statement of profitability based on:

(i) If the products are sold after further processing is carried out in the mill.

(ii) If they are sold at the split off point.

Operating Costing

9. In order to develop tourism, Nepal Airline has been given permit to operate three flights in a week between X and Y cities (both side). The airline operates a single aircraft of 160 seats capacity. The normal occupancy is estimated at 60% throughout the year of 52 weeks. The one-way fare is ₹ 7,200. The cost of operation of flights is:

Fuel cost (variable)	₹ 96,000 per flight
Food served on board on non-chargeable basis	₹ 125 per passenger
Commission	5% of fare applicable for all booking
Fixed cost:	
Aircraft lease	₹ 3,50,000 per flight
Landing Charges	₹ 72,000 per flight

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Required:

(i) Calculate the net operating income per flight.

(ii) The airline expects that its occupancy will increase to 108 passengers per flight if the fare is reduced to ₹ 6,720. Advise whether this proposal should be implemented or not.

Standard Costing

10. Aaradhya Ltd.manufactures a commercial product for which the standard cost per unit is as follows:

	(₹)
Material:	
5 kg. @ ₹ 4 per kg.	20.00
Labour:	
3 hours @ ₹10 per hour	30.00
Overhead	
Variable: 3 hours @ ₹1	3.00
Fixed: 3 hours @ ₹0.50	1.50
Total	54.50

During Jan. 20X8, 600 units of the product were manufactured at the cost shown below:

	(₹)
Materials purchased:	
5,000 kg. @ ₹4.10 per kg.	20,500
Materials used:	
3,500 kg.	
Direct Labour:	
1,700 hours @ ₹ 9	15,300
Variable overhead	1,900
Fixed overhead	900
Total	38,600

The flexible budget required 1,800 direct labour hours for operation at the monthly activity level used to set the fixed overhead rate.

Compute:

(a) Material price variance, (b) Material Usage variance; (c) Labour rate variance; (d) Labour efficiency variance; (e) Variable overhead expenditure variance; (f) Variable overhead efficiency variance; (g) Fixed overhead expenditure variance; (h) Fixed overhead

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volume variance; (i) Fixed overhead capacity variance; and (j) Fixed overhead efficiency variance.

Also reconcile the standard and actual cost of production.

Marginal Costing

11. A company sells its product at ₹ 15 per unit. In a period, if it produces and sells 8,000 units, it incurs a loss of ₹ 5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹ 4 per unit. Calculate break-even point both in terms of rupees as well as in units.

Budget and Budgetary Control

12. Gaurav Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 20X8-X9. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

	Minimax (MM)	Heavyhigh (HH)
Budgeted Production units	1,80,000	1,20,000
	(₹)	(₹)
Direct material cost per unit	220	280
Direct labour cost per unit	130	120
Manufacturing overhead	4,00,000	5,00,000

The estimated units to be sold in the first four months of the year 20X8-X9 are as under

	April	May	June	July
Minimax	8,000	10,000	12,000	16,000
Heavyhigh	6,000	8,000	9,000	14,000

Prepare production budget for the first quarter in monthwise

Miscellaneous

13. (a) Discuss the essential features of a good cost accounting system.

(b) Explain the difference between Cost Control and Control Reduction.

(c) Define Controllable Cost and Uncontrollable Cost.

(d) Distinguish between job and batch costing.

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SUGGESTED HINTS/ANSWERS

Cost Accounting

1. (1) A = Annual usage of parts = Monthly demand for monitors × 4 parts × 12 months

= 2,000 monitors × 4 parts × 12 months = 96,000 units

O = Ordering cost per order = ₹ 1,000/- per order

C_1 = Cost per part = ₹ 350/-

${}_iC_1$ = Inventory carrying cost per unit per annum

=20% × ₹ 350 = ₹ 70/- per unit, per annum

Economic order quantity (EOQ):

$$E.O.Q = \sqrt{\frac{2AO}{{}_iC_1}} = \sqrt{\frac{2 \times 96,000 \text{ units} \times ₹1,000}{₹70}}$$

= 1,656 parts (approx.)

The supplier is willing to supply 30,000 units at a discount of 5%, therefore cost of each part shall be ₹350 – 5% of 350 = ₹332.5

Total cost (when order size is 30,000 units):

= Cost of 96,000 units + Ordering cost + Carrying cost.

$$= (96,000 \text{ units} \times ₹ 332.50) + \left(\frac{96,000 \text{ units}}{30,000 \text{ units}} \times ₹1,000\right) + \frac{1}{2}(30,000 \text{ units} \times 20\% \times ₹ 332.50)$$

= ₹ 3,19,20,000 + ₹ 3,200* + ₹ 9,97,500 = ₹ 3,29,20,700

Total cost (when order size is 1,656 units):

$$= (96,000 \text{ units} \times ₹350) + \left(\frac{96,000 \text{ units}}{1,656 \text{ units}} \times ₹1,000\right) + \frac{1}{2}(1,656 \text{ units} \times 20\% \times ₹350)$$

= ₹3,36,00,000 + ₹57,970* + ₹57,960 = ₹3,37,15,930

Since, the total cost under the supply of 30,000 units with 5% discount is lower than that when order size is 1,656 units, therefore the offer should be accepted.

Note: While accepting this offer consideration of capital blocked on order size of 30,000 units has been ignored.

**Order size can also be taken in absolute figure.*

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(2) Reorder level

= Maximum consumption × Maximum re-order period

= 710 units × 5 weeks = 3,550 units

(3) Maximum level of stock

= Re-order level + Reorder quantity – (Min. usage × Min. reorder period)

= 3,550 units + 1,656 units – (140 units × 3 weeks) = 4,786 units.

(4) Minimum level of stock

= Re-order level – Normal usage × Average reorder period

= 3,550 units – (425 units × 4 weeks) = 1,850 units.

2. Calculation of :

1. Time saved and wages:

Workmen	**A**	**B**
Standard time (hrs.)	40	40
Actual time taken (hrs.)	32	30
Time saved (hrs.)	8	10
Wages paid @ ₹ x per hr. (₹)	32x	30x

2. Bonus Plan:

	Halsey	**Rowan**
Time saved (hrs.)	8	10
Bonus (₹)	4x $\left[\frac{8 \text{ hrs} \times ₹ \text{ x}}{2}\right]$	7.5x $\left[\frac{10 \text{ hrs}}{40 \text{ hrs}} \times 30\text{hrs} \times ₹ \text{ x}\right]$

3. Total wages:

Workman A: 32x + 4x = ₹ 36x

Workman B: 30x + 7.5x = ₹ 37.5x

Statement of factory cost of the job

Workmen	**A (₹)**	**B (₹)**
Material cost (assumed)	y	y
Wages (shown above)	36x	37.5x
Works overhead	240	225
Factory cost (given)	2,600	2,600

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The above relations can be written as follows:

36x + y + 240 = 2,600 (i)

37.5x+ y+ 225 = 2,600 (ii)

Subtracting (i) from (ii) we get

1.5x – 15 = 0

Or, 1.5 x = 15

Or, x = ₹ 10 per hour

On substituting the value of x in (i) we get y = ₹ 2,000

Hence the wage rate per hour is ₹ 10 and the cost of raw material is ₹ 2,000 on the job.

3. Sree Ajeet Ltd.

Statement showing comprehensive machine hour rate of Machine B

	(₹)
Standing Charges:	
Factory rent {(₹ 1,80,000/1,00,000 sq.ft) × 5,000 Sq.ft.}	9,000
Heat and Gas (₹ 60,000/15 machines)	4,000
Supervision (₹ 1,50,000/ 15 machines)	10,000
Depreciation [(₹ 1,80,000 – ₹ 10,000)/ 10 years]	17,000
Annual expenses on special equipment	12,000
	52,000
Fixed cost per hour (₹ 52,000/ 4,000 hrs.)	13/-

	Set up rate Per hour (₹)	Operational rate Per hour (₹)
Fixed cost	13.00	13.00
Power	--	5.00
Wages	25.00	12.50
Comprehensive machine hour rate per hour	38.00	30.50

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Statement of 'B' machine costs

to be absorbed on the two work orders

	Work order-1			Work order-2		
	Hours	Rate	Amount	Hours	Rate	Amount
		₹	₹	₹	₹	₹
Set up time cost	15	38	570	30	38	1,140
Operation time cost	100	30.5	3,050	190	30.5	5,795
Total cost			3,620			6,935

4. (i) Statement of Profit as per Financial records

(for the year ended March 31, 20X8)

	(₹)		(₹)
To Opening stock of Finished Goods	53,125	By Sales	22,80,000
To Work-in-process	46,000	By Closing stock of finished Goods	45,650
To Raw materials consumed	8,40,000	By Work-in-Process	41,200
To Direct labour	6,10,000	By Rent received	46,000
To Factory overheads	4,22,000	By Interest received	38,000
To Administration overheads	1,98,000		
To Selling & distribution overheads	72,000		
To Dividend paid	1,22,000		
To Bad debts	18,000		
To Profit	69,725		
	24,50,850		24,50,850

Statement of Profit as per Costing records

(for the year ended March 31,20X8)

	(₹)
Sales revenue (A) (12,615 units)	22,80,000

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Cost of sales:	
Opening stock (625 units × ₹ 120)	75,000
Add: Cost of production of 12,405 units (Refer to working note 2)	21,63,350
Less: Closing stock (₹174.39 × 415 units)	(72,372)
Cost of goods sold (12,615 units)	21,65,978
Selling & distribution overheads (12,615 units × ₹ 3)	37,845
Cost of sales: (B)	22,03,823
Profit: {(A) – (B)}	76,177

(ii) Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		76,177
Add: Administration overheads over absorbed (₹2,81,550 – ₹1,98,000)	83,550	
Opening stock overvalued (₹75,000 – ₹53,125)	21,875	
Interest received	38,000	
Rent received	46,000	
Factory overheads over recovered (₹4,27,000 – ₹4,22,000)	5,000	1,94,425
		2,70,602
Less: Selling & distribution overheads under recovery (₹72,000 – ₹37,845)	34,155	
Closing stock overvalued (₹72,372 – ₹45,650)	26,722	
Dividend	1,22,000	
Bad debts	18,000	(2,00,877)
Profit as per financial accounts		69,725

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Working notes:

1. Number of units produced

	Units
Sales	12,615
Add: Closing stock	415
Total	13,030
Less: Opening stock	(625)
Number of units produced	12,405

2. Cost Sheet

		(₹)
Raw materials consumed		8,40,000
Direct labour		6,10,000
Prime cost		14,50,000
Factory overheads (70% of direct wages)		4,27,000
Factory cost		18,77,000
Add: Opening work-in-process		46,000
Less: Closing work-in-process		41,200
Factory cost of goods produced		18,81,800
Administration overheads (15% of factory cost)		2,81,550
Cost of production of 12,405 units (Refer to working note 1) Cost of production per unit:		21,63,350
$= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹\ 21,63,350}{12,405 \text{ units}} = ₹174.39$		

5. Contract Account for the year ended 31st March, 20X8

	(₹'000)		(₹' 000)
To Material issued to site	5,000	By Material at site	1,800
To Direct wages 3,800		By Material returned	100
Add: Outstanding wages 110	3,910	By Work-in-progress:	

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To Plant hire	700	- Value of work certified	10,000
To Site office cost	270	- Work uncertified	230
To Direct expenses	500		
To Depreciation (special plant)	300		
To Notional profit c/d	1,450		
	12,130		12,130

6. Determination of quotation price for the job

Cost	**(₹)**
Direct Material (10kg × ₹10)	100
Direct Labour (20hrs × ₹ 5)	100
Variable production overhead (20hrs × ₹ 2)	40
Fixed Overhead $\left(\frac{₹1,00,000}{10,000\,\text{budgeted hours}} \times 20\,\text{hours}\right)$	200
Other costs	50
Total costs	490

Net profit is 30% of sales, therefore total costs represent 70% (₹490 × 100) ÷ 70 = ₹700 price to quote for job.

(To check answer is correct; profit achieved will be ₹ 210 (₹700 - ₹ 490)

= ₹210 ÷₹700 = 30%)

7. Statement of Equivalent Production

Process III

Input Details	**Units**	**Output Particulars**	**Units**	**Equivalent Production**					
				Material-A		**Material-B**		**Labour & Overhead**	
				%	**Units**	**%**	**Units**	**%**	**Units**
Opening WIP	1,600	Work on Op. WIP	1,600	-	-	20	320	40	640
Process - II Transfer	55,400	Introduced & completed during the month	50,600	100	50,600	100	50,600	100	50,600

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		Normal loss (5% of 52,800 units)	2,640	-	-	-	-	-	-
		Closing WIP	4,200	100	4,200	70	2,940	50	2,100
		Abnormal Gain	(2,040)	100	(2,040)	100	(2,040)	100	(2,040)
	57,000		57,000		52,760		51,820		51,300

Working note:

Production units = Opening units + Units transferred from Process-II – Closing Units

= 1,600 units + 55,400 units – 4,200 units

= 52,800 units

Statement of Cost

	Cost (₹)	Equivalent units	Cost per equivalent units (₹)
Material A (Transferred from previous process)	6,23,250		
Less: Scrap value of normal loss (2,640 units × ₹ 5)	(13,200)		
	6,10,050	52,760	11.5627
Material B	2,12,400	51,820	4.0988
Labour	96,420	51,300	1.8795
Overheads	56,400	51,300	1.0994
	9,75,270		18.6404

Statement of apportionment of Process Cost

		Amount (₹)	Amount (₹)
Opening WIP	Material A		24,000
Completed opening WIP units -1600	Material B (320 units × ₹ 4.0988)	1311.62	
	Wages (640 units × ₹ 1.8795)	1202.88	
	Overheads (640 units × ₹ 1.0994)	703.62	3,218.12
Introduced & Completed - 50,600 units	50,600 units × ₹ 18.6404		9,43,204.24

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Total cost of 52,200 finished goods units			9,70,422.36
Closing WIP units - 4,200	Material A (4,200 units × ₹ 11.5627)		48,563.34
	Material B (2,940 units × ₹ 4.0988)		12,050.47
	Wages (2,100 units × ₹ 1.8795)		3,946.95
	Overheads (2,100 units × ₹ 1.0994)		2,308.74
			66,869.50
Abnormal gain units - 2,040	(2,040 units × ₹ 18.6404)		38026.42

Process III A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Balance b/d	1,600	24,000	By Normal loss	2,640	13,200
To Process II A/c	55,400	6,23,250	By Finished goods	52,200	9,70,422.36
To Direct material		2,12,400	By Closing WIP	4,200	66,874.06*
To Direct wages		96,420			
To Production overheads		56,400			
To Abnormal gain	2,040	38,026.42			
	59,040	10,50,496.42		59,040	10,50,496.42

* Difference in figure due to rounding off has been adjusted with closing WIP

8. (i) Statement of profitability of the Oil Mill (after carrying out further processing) for the quarter ending 31st March 20X8.

Products	Sales Value after further processing	Share of Joint cost	Additional processing cost	Total cost after processing	Profit (loss)
ACH	1,72,500	98,667	43,000	1,41,667	30,833
BCH	15,000	19,733	9,000	28,733	(13,733)
CSH	6,000	4,933	--	4,933	1,067
DSH	45,000	24,667	1,500	26,167	18,833
	2,38,500	1,48,000	53,500	2,01,500	37,000

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(ii) Statement of profitability at the split off point

Products	Selling price of split off	Output in units	Sales value at split off point	share of joint cost	profit at split off point
ACH	15.00	8,000	1,20,000	98,667	21,333
BCH	6.00	4,000	24,000	19,733	4,267
CSH	3.00	2,000	6,000	4,933	1,067
DSH	7.50	4,000	30,000	24,667	5,333
			1,80,000	1,48,000	32,000

Note: Share of Joint Cost has been arrived at by considering the sales value at split off point.

9. (i) No. of passengers 160 seats × 60% = 96

	(₹)	(₹)
Fare collection (96 passengers ×₹7,200)		6,91,200
Variable costs:		
Fuel	96,000	
Food (96 passengers ×₹125)	12,000	
Commission (5% of ₹6,91,200)	34,560	1,42,560
Contribution per flight		5,48,640
Fixed costs:		
Aircraft Lease	3,50,000	
Landing charges	72,000	4,22,000
Net operating income per flight		1,26,640

(ii)

Fare collection (108 passengers ×₹ 6,720)		7,25,760
Variable costs:		
Fuel	96,000	
Food (108 passengers ×₹125)	13,500	
Commission (5% of ₹ 7,25,760)	36,288	1,45,788
Contribution		5,79,972

There is an increase in contribution by ₹ 31,332. Hence the proposal is acceptable.

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10. (a) Material price variance:

= (Standard price – Actual Price) × Actual quantity

= (₹ 4 – ₹ 4.10) × 5,000 = ₹ 500 Adv.

(b) Material usage variance:

= (Std. quantity for actual output – Actual qtty.) × Std. price

= (600 × 5 – 3,500) × 4 = ₹ 2,000 Adv.

(c) Labour Rate Variance:

= (Standard rate – Actual rate) × Actual hours

= (₹10 – ₹9) × 1,700 = ₹ 1,700 Fav.

(d) Labour Efficiency Variance:

= (Standard hours for actual output – Actual hours) × Standard rate

= (600 × 3 – 1,700) × ₹10

= ₹ 1,000 Fav.

(e) Variable Overhead Expenditure Variance

= (Actual Hours × Standard Rate) – Actual Overhead

= (1,700 × ₹ 1) – ₹ 1,900

= ₹ 200 Adv.

(f) Variable Overhead Efficiency Variance:

= Std. hours for actual output – Actual hours) × Std. rate

= (600 × 3 – 1,700) × ₹1 = ₹100 Fav.

(g) Fixed Overhead Expenditure Variance:

= (Budgeted overhead – Actual overhead)

= (1,800 × 0.50 – 900) = Nil

(h) Fixed Overhead Volume Variance:

= (Std. hours for actual output – Budgeted hours) × Std. rate

= (600 × 3 – 1,800) × ₹ 0.50 = Nil

(i) Fixed Overhead Capacity Variance:

= (Budgeted hours – Actual Hours) × Standard rate

= (1,800 – 1,700) × ₹ 0.50 = ₹ 50 Adv.

(j) Fixed Overhead Efficiency Variance:

= (Std. hours for actual output – Actual hours) × Standard rate

= (600 × 3 – 1,700) × ₹ 0.50 = ₹ 50 Fav.

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Verification:	**(₹)**	**(₹)**
Overhead recovered: 600 units @ ₹4.50		2,700
Actual Overhead:		
Variable	1,900	
Fixed	900	2,800
		100 Adv.
Variable expenditure variance		200 Adv
Variable Efficiency variance		100 Fav.
Fixed expenditure variance		Nil
Fixed overhead volume variance		Nil
		100 Adv.

Reconciliation Statement

Standard Cost: 600 units @ ₹54.50		32,700	
Actual Cost:	38,600		
Less: Material Stock at standard cost: (1,500 × ₹ 4)	6,000	(32,600)	100 Fav.
Variances:	Adv. **(₹)**	Fav. **(₹)**	
Material price	500		
Material usage	2,000		
Labour rate		1,700	
Labour efficiency		1,000	
Variable expenditure	200		
Variable efficiency		100	
Total	2,700	2,800	100 Fav.

11. We know that S – V = F + P (S- Sales, V- Variable cost, F- Fixed cost and P- Profit/loss)

∴ Suppose variable cost = x per unit

Fixed Cost = y

When sales is 8,000 units, then

$15 \times 8{,}000 - 8{,}000\ x = y - 40{,}000$..... (1)

When sales volume raised to 20,000 units, then

$15 \times 20{,}000 - 20{,}000\ x = y + 80{,}000$..... (2)

Or, $1{,}20{,}000 - 8{,}000\ x = y - 40{,}000$..... (3)

And $3{,}00{,}000 - 20{,}000\ x = y + 80{,}000$..... (4)

From (3) & (4) we get x = ₹ 5.

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Variable cost per unit = ₹ 5

Putting this value in 3rd equation:

1,20,000 – (8,000 × 5) = y – 40,000

or y = ₹ 1,20,000

Fixed Cost = ₹ 1,20,000

$$\text{P/V ratio} = \frac{S - V}{S} = \frac{15 - 5}{15} \times 100 = \frac{200}{3} = 66\frac{2}{3}\%.$$

Suppose break-even sales = x

15x – 5x = 1,20,000 (at BEP, contribution will be equal to fixed cost)

x = 12,000 units.

Or Break-even sales in units = 12,000

Break-even sales in rupees = 12,000 ×₹ 15 = ₹ 1,80,000

12. Production budget of Product Minimax and Heavyhigh (in units)

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

* Opening stock of April is the closing stock of March, which is as per company's policy 25% of next months sale.

Production Cost Budget

Element of cost	Rate (₹)		Amount (₹)	
	MM (32,000 units)	HH (25,000 units)	MM	HH
Direct Material	220	280	70,40,000	70,00,000

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Direct Labour	130	120	41,60,000	30,00,000
Manufacturing Overhead				
(4,00,000/ 1,80,000 × 32,000)			71,111	
(5,00,000/ 1,20,000 × 25,000)				1,04,167
			1,12,71,111	1,01,04,167

13. (a) The essential features, which a good cost and management accounting system should possess, are as follows:

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

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

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

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

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

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

(b)

Cost Control	Cost Reduction
1. Cost control aims at maintaining the costs in accordance with the established standards.	1. Cost reduction is concerned with reducing costs. It challenges all standards and endeavours to better them continuously
2. Cost control seeks to attain lowest possible cost under existing conditions.	2. Cost reduction recognises no condition as permanent, since a change will result in lower cost.

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3.	In case of cost control, emphasis is on past and present	3.	In case of cost reduction, it is on present and future.
4.	Cost control is a preventive function	4.	Cost reduction is a corrective function. It operates even when an efficient cost control system exists.
5.	Cost control ends when targets are achieved.	5.	Cost reduction has no visible end.

(c) (i) Controllable 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. For example, direct costs comprising direct labour, direct material, direct expenses and some of the overheads are generally controllable by the shop level management.

(ii) Uncontrollable Costs - Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs. For example, expenditure incurred by, say, the tool room is controllable by the foreman in-charge of that section but the share of the tool-room expenditure which is apportioned to a machine shop is not to be controlled by the machine shop foreman.

(d) Distinction between Job and Batch Costing:

Sr. No	Job Costing	Batch Costing
1	Method of costing used for non-standard and non- repetitive products produced as per customer specifications and against specific orders.	Homogeneous products produced in a continuous production flow in lots.
2	Cost determined for each Job	Cost determined in aggregate for the entire Batch and then arrived at on per unit basis.
3	Jobs are different from each other and independent of each other. Each Job is unique.	Products produced in a batch are homogeneous and lack of individuality

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PART-II: FINANCIAL MANAGEMENT

QUESTIONS

Time Value of Money

1. Mr. X took a loan of ₹30,00,000 lakh to purchase an asset from a financial institution at 14% interest per year. The amount has to be repaid in 10 equal annual instalments. Calculate the instalment amount.

Fund Flow Statement

2. Following are the financial statements of Zed Ltd.:

Balance Sheet as on

	March 31, 20X7(₹)	March 31, 20X6 (₹)
Capital and Liabilities:		
Share capital, ₹10 par value	1,67,500	1,50,000
Share premium	3,35,000	2,37,500
Reserves and Surplus	1,74,300	1,23,250
Debentures	2,40,000	--
Long-term loans	40,000	50,000
Creditors	28,800	27,100
Bank Overdraft	7,500	6,250
Accrued expenses	4,350	4,600
Income-tax payable	48,250	16,850
	10,45,700	6,15,550
Assets:		
Land	3,600	3,600
Building, net of depreciation	6,01,800	1,78,400
Machinery, net of depreciation	1,10,850	1,07,050
Investment in 'A' Ltd.	75,000	--
Stock	58,800	46,150
Prepaid expenses	1,900	2,300
Debtors	76,350	77,150
Trade Investments	40,000	1,05,000

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Cash	77,400	95,900
	10,45,700	6,15,550

Income Statement

for the year ended March 31, 20X7

	(₹)
Net Sales	13,50,000
Less: Cost of goods sold and operating expenses (including depreciation on buildings of ₹ 6,600 and depreciation on machinery of ₹ 11,400)	(12,58,950)
Net operating profit	91,050
Gain on sale of trade investments	6,400
Gain on sale of machinery	1,850
Profits before tax	99,300
Income-tax	(48,250)
Profit after tax	51,050

Additional information:

(i) Machinery with a net book value of ₹9,150 was sold during the year.

(ii) The shares of 'A' Ltd. were acquired by issue of debentures.

Required:

Prepare a Funds Flow Statement (Statement of changes in financial position on Working capital basis) for the year ended March 31, 20X7.

Ratio Analysis

3. Assuming the current ratio of a Company is 2, State in each of the following cases whether the ratio will improve or decline or will have no change:

(i) Payment of current liability

(ii) Purchase of fixed assets by cash

(iii) Cash collected from Customers

(iv) Bills receivable dishonoured

(v) Issue of new shares

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Cost of Capital

4. M/s. Navya Corporation has a capital structure of 40% debt and 60% equity. The company is presently considering several alternative investment proposals costing less than ₹ 20 lakhs. The corporation always raises the required funds without disturbing its present debt equity ratio.

   The cost of raising the debt and equity are as under:

Project cost	Cost of debt	Cost of equity
Upto ₹ 2 lakhs	10%	12%
Above ₹ 2 lakhs & upto to ₹ 5 lakhs	11%	13%
Above ₹ 5 lakhs & upto ₹10 lakhs	12%	14%
Above ₹10 lakhs & upto ₹ 20 lakhs	13%	14.5%

   Assuming the tax rate at 50%, calculate:-

   (i) Cost of capital of two projects X and Y whose fund requirements are ₹ 6.5 lakhs and ₹ 14 lakhs respectively.

   (ii) If a project is expected to give after tax return of 10%, determine under what conditions it would be acceptable?

Capital Structure Decisions

5. Rounak Ltd. is an all equity financed company with a market value of ₹ 25,00,000 and cost of equity (K_e) 21%. The company wants to buyback equity shares worth ₹5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to compute:

   (i) Market value of J Ltd.

   (ii) Cost of Equity (K_e)

   (iii) Weighted average cost of capital (using market weights) and comment on it.

Leverage

6. A firm has sales of ₹ 75,00,000 variable cost is 56% and fixed cost is₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000. You are required to interpret:

   (i) The firm's ROI?

   (ii) Does it have favourable financial leverage?

   (iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?

   (iv) The operating, financial and combined leverages of the firm?

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(v) If the sales is increased by 10% by what percentage EBIT will increase?

(vi) At what level of sales the EBT of the firm will be equal to zero?

(vii) If EBIT increases by 20%, by what percentage EBT will increase?

Capital Budgeting

7. Shiv 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 (₹)
	Existing Machine (80,000 units)	**New Machine (1,00,000 units)**	**Difference**
Materials	75.0	63.75	(11.25)
Wages & Salaries	51.25	37.50	(13.75)
Supervision	20.0	25.0	5.0
Repairs and Maintenance	11.25	7.50	(3.75)
Power and Fuel	15.50	14.25	(1.25)
Depreciation	0.25	5.0	4.75
Allocated Corporate Overheads	10.0	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 ₹ 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) Calculate the internal rate of return of the replacement decision.

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

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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
$PVIF_{0.25,t}$	0.80	0.64	0.512	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

Management of Receivables (Debtors)

8. Tony Limited, manufacturer of Colour TV sets is considering the liberalization of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be sold to the customers in addition to other sales are as follows:

Quantity sold (No. of TV Sets)

Credit Period (Days)	A	B	C
0	1,000	1,000	-
30	1,000	1,500	-
60	1,000	2,000	1,000
90	1,000	2,500	1,500

The selling price per TV set is ₹ 9,000. The expected contribution is 20% of the selling price. The cost of carrying receivable averages 20% per annum.

You are required:-

(a) Compute the credit period to be allowed to each customer.

(Assume 360 days in a year for calculation purposes).

(b) Demonstrate the other problems the company might face in allowing the credit period as determined in (a) above?

Financing of Working Capital

9. 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:

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(₹ Crores)

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.

(₹ Crores)

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

Miscellaneous

10. (i) "The profit maximization is not an operationally feasible criterion." Identify.

  (ii) Explain the principles of "Trading on equity".

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SUGGESTED HINTS/ANSWERS

1. $A = P\left(\frac{I(1+I)^n}{(1+I)^n - 1}\right)$

Where,

A = Amount of Instalment

P = Principal amount of loan

I = Interest rate

n = Loan repayment period.

$A = 30,00,000\left(\frac{0.14(1+0.14)^{10}}{(1+0.14)^{10} - 1}\right)$

$A = 30,00,000 \times \frac{0.14 \times 3.707}{2.707}$

A = 5,75,153

Or

$A = \frac{P}{PVIFA_{n,I}}$

$A = \frac{30,00,000}{PVIFA_{10,0.14}} = \frac{30,00,000}{5.216} = 5,75,153$

2. Fund Flow Statement as at 31st March 20X7

		(₹)
A.	**Sources of Funds:**	
	(i) Fund from Business Operations	67,200
	(ii) Sale of Machinery (₹ 9,150 + ₹ 1,850)	11,000
	(iii) Proceeds from issue of Debentures (₹ 2,40,000 – ₹ 75,000*)	1,65,000
	(iv) Proceeds from issue of Shares (including share premium)	1,15,000
	Total sources	3,58,200
B.	**Application of Funds:**	
	(i) Purchase of Building (₹ 6,01,800 + ₹ 6,600 – ₹ 1,78,400)	4,30,000
	(ii) Purchase of Machinery	24,350

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(iii) Payment of long-term loan(₹50,000 – ₹40,000)	10,000
Total uses	4,64,350
Net Decrease in Working Capital (A–B)	(1,06,150)

*Investment worth ₹75,000 in A Ltd. has been acquired without incurring any cash outflow hence, it will not affect the working capital.

Workings:

1. Schedule of Changes in Working Capital

	March 31, 20X7	March 31, 20X6	Change in Working Capital	
			Increase	Decrease
Current Assets				
Stock	58,800	46,150	12,650	--
Prepaid expenses	1,900	2,300	--	400
Debtors	76,350	77,150	--	800
Trade Investments	40,000	1,05,000	--	65,000
Cash	77,400	95,900	--	18,500
	2,54,450	3,26,500	--	--
Current Liabilities			--	--
Creditors	28,800	27,100	--	1,700
Bank overdraft	7,500	6,250	--	1,250
Accrued expenses	4,350	4,600	250	--
Income tax payable	48,250	16,850	--	31,400
	88,900	54,800	--	--
Net Working Capital	1,65,550	2,71,700	--	--
Decrease in net working capital	1,06,150	--	1,06,150	--
	2,71,700	2,71,700	1,19,050	1,19,050

2. Machinery Account

	(₹)		(₹)
To Balance b/d	1,07,050	By Bank A/c (Sale)	11,000
To Bank A/c (Purchase of machinery) (Bal. figure)	24,350	By Depreciation (given)	11,400
To P & L A/c (Profit)	1,850	By Balance c/d	1,10,850
	1,33,250		1,33,250

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3. Trade Investments Account

	(₹)		(₹)
To Balance b/d	1,05,000	By Bank (Sale of trade investments)	65,000
		By Balance c/d	40,000
	1,05,000		1,05,000

4. Estimation of Funds flow from Operations

	(₹)	(₹)
Profits after tax		51,050
Add: Depreciation on Buildings	6,600	
Depreciation on Machinery	11,400	18,000
		69,050
Less: Gain on sale of machinery		1,850
Funds from Operations		67,200

Gain on sale of trade investments has been considered as an operating income. Trade investments have been considered as part of current assets.

3. Current Ratio = $\frac{\text{Current Assets(CA)}}{\text{Current Liabilities(CL)}}$ = 2 i.e. 2 : 1

S. No.	Situation	Improve/ Decline/ No Change	Reason
(i)	Payment of Current liability	Current Ratio will improve	Let us assume CA is ₹ 2 lakhs & CL is ₹ 1 lakh. If payment of Current Liability = ₹ 10,000 then, CA = 1, 90,000 CL = 90,000. Current Ratio = $\frac{1,90,000}{90,000}$ = 2.11 : 1. When Current Ratio is 2:1 Payment of Current liability will reduce the same amount in the numerator and denominator. Hence, the ratio will improve.
(ii)	Purchase of Fixed Assets by cash	Current Ratio will decline	Since the cash being a current asset converted into fixed asset, current

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			assets reduced, thus current ratio will fall.
(iii)	Cash collected from Customers	Current Ratio will not change	Cash will increase and Debtors will reduce. Hence No Change in Current Asset.
(iv)	Bills Receivable dishonoured	Current Ratio will not change	Bills Receivable will come down and debtors will increase. Hence no change in Current Assets.
(v)	Issue of New Shares	Current Ratio will improve	As Cash will increase, Current Assets will increase and current ratio will increase.

4. (i) Statement of Weighted Average Cost of Capital

Project cost	Financing	Proportion of capital Structure	After tax cost (1–Tax 50%)	Weighted average cost (%)
Upto ₹ 2 Lakhs	Debt	0.4	10% (1 – 0.5) = 5%	0.4 × 5 = 2.0
	Equity	0.6	12%	0.6 × 12 = 7.2
				9.2%
Above ₹ 2 lakhs & upto to ₹ 5 Lakhs	Debt	0.4	11% (1 – 0.5) = 5.5%	0.4 × 5.5 = 2.2
	Equity	0.6	13%	0.6 × 13 = 7.8
				10.0%
Above ₹ 5 lakhs & upto ₹ 10 lakhs	Debt	0.4	12% (1 – 0.5) = 6%	0.4 × 6 = 2.4
	Equity	0.6	14%	0.6 × 14 = 8.4
				10.8%
Above ₹ 10 lakhs & upto ₹ 20 lakhs	Debt	0.4	13% (1 – 0.5) = 6.5%	0.4 × 6.5 = 2.6
	Equity	0.6	14.5%	0.6 × 14.5 = 8.7
				11.3%

Project	Fund requirement	Cost of capital
X	₹6.5 lakhs	10.8% (from the above table)
Y	₹14 lakhs	11.3% (from the above table)

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(ii) If a Project is expected to give after tax return of 10%, it would be acceptable provided its project cost does not exceed ₹5 lakhs or, after tax return should be more than or at least equal to the weighted average cost of capital.

5. Value of a company (V) = Value of equity (S) + Value of debt (D)

$$₹25,00,000 = \frac{\text{Net Income (NI)}}{K_e} + ₹5,00,000$$

Or, Net Income (NI) = 0.21 (₹25,00,000 – ₹5,00,000)

Market Value of Equity = ₹25,00,000

K_e =21%

$$\frac{\text{Net income (NI) for equity holders}}{K_e} = \text{Market Value of Equity}$$

$$\frac{\text{Net income (NI) for equity holders}}{0.21} = 25,00,000$$

Net income for equity holders = 5,25,000

EBIT= 5,25,000/0.7 = 7,50,000

	All Equity	Debt and Equity
EBIT	7,50,000	7,50,000
Interest to debt-holders	-	(75,000)
EBT	7,50,000	6,75,000
Taxes (30%)	(2,25,000)	(2,02,500)
Income available to equity shareholders	5,25,000	4,72,500
Income to debt holders plus income available to shareholders	5,25,000	5,47,500

Present value of tax-shield benefits = ₹ 5,00,000 × 0.30 = ₹ 1,50,000

(i) Value of Restructured firm

= ₹ 25,00,000 + ₹ 1,50,000 = ₹ 26,50,000

(ii) Cost of Equity (K_e)

Total Value = ₹ 26,50,000

Less: Value of Debt = ₹ 5,00,000

Value of Equity = ₹ 21,50,000

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$K_e = \frac{4,72,500}{21,50,000} = 0.219 = 21.98\%$

(iii) WACC (on market value weight)

Cost of Debt (after tax)= 15% (1- 0.3)= 0.15 (0.70) = 0.105= 10.5%

Components of Costs	Amount	Cost of Capital (%)	Weight	WACC (%)
Equity	21,50,000	21.98	0.81	17.80
Debt	5,00,000	10.50	0.19	2.00
	26,50,000			19.80

Comment: At present the company is all equity financed. So, $K_e = K_o$ i.e. 21%. However,after restructuring, the K_o would be reduced to 19.80% and K_e would increase from 21% to 21.98%.

6. Income Statement

Particulars	Amount (₹)
Sales	75,00,000
Less: Variable cost (56% of 75,00,000)	(42,00,000)
Contribution	33,00,000
Less: Fixed costs	(6,00,000)
Earnings before interest and tax (EBIT)	27,00,000
Less: Interest on debt (@ 9% on ₹ 45 lakhs)	(4,05,000)
Earnings before tax (EBT)	22,95,000

(i) $ROI = \frac{EBIT}{Capital\ employed} \times 100 = \frac{EBIT}{Equity + Debt} \times 100$

$= \frac{27,00,000}{55,00,000 + 45,00,000} \times 100 = 27\%$

(ROI is calculated on Capital Employed)

(ii) ROI = 27% and Interest on debt is 9%, hence, it has a favourable financial leverage.

(iii) $Capital\ Turnover = \frac{Net\ Sales}{Capital}$

$Or = \frac{Net\ Sales}{Capital} = \frac{75,00,000}{1,00,00,000} = 0.75$

Which is very low as compared to industry average of 3.

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(iv) Calculation of Operating, Financial and Combined leverages

(a) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}} = \frac{33,00,000}{27,00,000} = 1.22$ (approx)

(b) Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}} = \frac{27,00,000}{22,95,000} = 1.18$ (approx)

(c) Combined Leverage $= \frac{\text{Contribution}}{\text{EBT}} = \frac{33,00,000}{22,95,000} = 1.44$ (approx)

Or = Operating Leverage × Financial Leverage = 1.22 × 1.18 = 1.44 (approx)

(v) Operating leverage is 1.22. So if sales is increased by 10%. EBIT will be increased by 1.22 × 10 i.e. 12.20% (approx)

(vi) Since the combined Leverage is 1.44, sales have to drop by 100/1.44 i.e. 69.44% to bring EBT to Zero

Accordingly, New Sales = ₹75,00,000 × (1-0.6944)

=₹75,00,000 × 0.3056

= ₹ 22,92,000 (approx)

Hence at ₹22,92,000 sales level EBT of the firm will be equal to Zero.

(vii) Financial leverage is 1.18. So, if EBIT increases by 20% then EBT will increase by 1.18 × 20 = 23.6% (approx)

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

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.

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 allocated from corporate office therefore they are irrelevant. The depreciation tax shield may be computed separately. Excluding depreciation and

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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

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

= {52,00,000 – 21,60,000}×0.60

= ₹ 18,24,000

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	-	1824	1824	1824	1824	1824
2	Depreciation (₹ 60,00,000 – 2,50,000)/5	-	1150	1150	1150	1150	1150
3	Tax shield on depreciation (Depreciation × Tax rate)	-	460	460	460	460	460
4	Net cash flows from operations (1+3)*	-	2284	2284	2284	2284	2284
5	Initial cost	(5850)					
6	Net Salvage Value (2,50,000 – 35,000)	-	-	-	-	-	215
7	Net Cash Flows (4+5+6)	(5850)	2284	2284	2284	2284	2499
8	PVF at 15%	1.00	0.8696	0.7561	0.6575	0.5718	0.4972
9	PV	(5850)	1986.166	1726.932	1501.73	1305.99	1242.50
10	NPV	₹ 1913.32					

* 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 - .40)

= ₹ 11,34,000

So profit before depreciation and after tax is :

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

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(ii)

						₹ ('000)
	0	**1**	**2**	**3**	**4**	**5**
NCF	(5850)	2284	2284	2284	2284	2499
PVF at 20%	1.00	0.8333	0.6944	0.5787	0.4823	0.4019
PV	(5850)	1903.257	1586.01	1321.751	1101.57	1004.35
PV of benefits	6916.94					
PVF at 30%	1.00	0.7692	0.5917	0.4550	0.3501	0.2693
PV	(5850)	1756.85	1351.44	1039.22	799.63	672.98
PV of benefits	5620.12					

$$\text{IRR} = 20\% + 10\% \times \frac{1066.94}{1296.82} = 28.23\%$$

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

8. (a) In case of customer A, there is no increase in sales even if the credit is given. Hence comparative statement for B & C is given below:

Particulars	**Customer B**				**Customer C**			
1. Credit period (days)	0	30	60	90	0	30	60	90
2. Sales Units	1,000	1,500	2,000	2,500	-	-	1,000	1,500
	₹ in lakhs				**₹in lakhs**			
3. Sales Value	90	135	180	225	-	-	90	135
4. Contribution at 20% (A)	18	27	36	45	-	-	18	27
5. Receivables:- $\frac{\text{Credit Period} \times \text{Sales}}{360}$	-	11.25	30	56.25	-	-	15	33.75
6. Debtors at cost i.e. 80% of 11.25	-	9	24	45	-	-	12	27
7. Cost of carrying debtors at 20% (B)	-	1.8	4.8	9	-	-	2.4	5.4
8. Excess of contributions over cost of carrying debtors (A – B)	18	25.2	31.2	36	-	-	15.6	21.6

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The excess of contribution over cost of carrying Debtors is highest in case of credit period of 90 days in respect of both the customers B and C. Hence, credit period of 90 days should be allowed to B and C.

(b) Problem;-

(i) Customer A is taking 1000 TV sets whether credit is given or not. Customer C is taking 1000 TV sets at credit for 60 days. Hence A also may demand credit for 60 days compulsorily.

(ii) B will take 2500 TV sets at credit for 90 days whereas C would lift 1500 sets only. In such case B will demand further relaxation in credit period i.e. B may ask for 120 days credit.

9. (i) Statement showing Working Capital for each policy

(₹ in crores)

	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)	17.3%	17.7%	19.2%
(c) Current ratio: (i)/(iv)	1.92	1.67	1.11

(ii) Statement Showing Effect of Alternative Financing Policy

(₹ in crores)

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
Long term Debt: (vi)	1.12	0.66	0.16

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Equity Capital (vii)	2.50	2.50	2.50
Total liabilities	6.50	6.50	6.50
Forecasted Sales	11.50	11.50	11.50
EBIT: (viii)	1.15	1.15	1.15
Less: Interest short-term debt: (ix)	0.06 (12% of ₹ 0.54)	0.12 (12% of ₹ 1.00)	0.18 (12% of ₹ 1.50)
Long term debt : (x)	0.18 (16% of ₹ 1.12)	0.11 (16% of ₹ 0.66)	0.03 (16% of ₹ 0.16)
Earning before tax: (xi) - (ix+x)	0.91	0.92	0.94
Tax @ 35%	(0.32)	(0.32)	(0.33)
Earning after tax: (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 Equity shareholders' capital: (xii)/(vii)	23.6%	24%	24.4%
(c) Current Ratio: [(i)/(iv)+(v)]	1.35%	1.17	1.02

10. (i) The profit maximisation is not an operationally feasible criterion." This statement is true because profit maximisation can be a short-term objective for any organisation and cannot be its sole objective. Profit maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:

(i) Vague term: The definition of the term profit is ambiguous. Does it mean short term or long term profit? Does it refer to profit before or after tax? Total profit or profit per share?

(ii) Timing of Return: The profit maximization objective does not make distinction between returns received in different time periods. It gives no consideration to the time value of money, and values benefits received today and benefits received after a period as the same.

(iii) It ignores the risk factor.

(iv) The term maximization is also vague.

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(ii) The term trading on equity means debts are contracted and loans are raised mainly on the basis of equity capital. Those who provide debt have a limited share in the firm's earning and hence want to be protected in terms of earnings and values represented by equity capital. Since fixed charges do not vary with firms earnings before interest and tax, a magnified effect is produced on earning per share. Whether the leverage is favourable, in the sense, increase in earnings per share more proportionately to the increased earnings before interest and tax, depends on the profitability of investment proposal. If the rate of returns on investment exceeds their explicit cost, financial leverage is said to be positive.

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