

PAPER – 4 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I : COST ACCOUNTING

QUESTIONS

Short Answer Type Questions from Misc Chapters

1. Give brief answers to the following:
 - (i) If margin of safety is ₹ 2, 40,000 (40% of sales) and P/V ratio is 30% of Gupta Ltd, calculate its (1) Break even sales, and (2) Amount of profit on sales of ₹ 9,00,000.
 - (ii) In a period, 5640 kg of material were used at a total standard cost of ₹ 23,124. The material usage variance was ₹ 246 (Adverse). What was the standard weight of material allowed for the period?
 - (iii) What is the difference between a Cost centre and Cost unit.
 - (iv) Differentiate between Period cost and Product cost.
 - (v) How is Absorption Costing different from Marginal Costing?

Material

2. (a) The purchase department of a company has received an offer of quantity discounts on its orders of materials as under:

<i>Price per ton</i>	<i>Tons ordered</i>
₹	
1,200	less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above

The annual requirement for the material is 5,000 tons. The ordering cost per order is ₹ 1,200 and the stock holding cost is estimated at 20% of material cost per annum.

You are required to compute the most economical purchase level.

- (b) What will be your answer to the above question, if there are no discount offered and the price per ton is ₹ 1,500?

Labour

3. Three workers Sachin, Sourav, Rahul produced 80, 100 and 120 pieces respectively of a product 'X' on a particular day in May in a factory. The time allowed for 10 units of Product X is 1 hour and their hourly rate is ₹ 4. Calculate followings for each of these three workers :

- (1) Earnings for the day, and
- (2) Effective Rate of Earnings per hour under: (a) Straight piece-rate, (b) Halsey Premium Bonus and (c) Rowan Premium Bonus methods of labour remuneration.
4. (A) Calculate the monthly remuneration of three workers X, Y and Z from the following data:
- (a) Standard production per month per worker – 4,000 units
- (b) Actual production during the month: X – 3,400 units
Y – 3,000 units
Z – 3,800 units
- (c) Piece work rate is 25 paise per unit.
- (d) Additional production bonus is Rs. 10 for each percentage of actual production exceeding 80% standard production (e.g., 79% nil, 80% nil, 81% ₹ 10, 82% ₹ 20 and so on).
- (e) Fixed dearness allowance, ₹ 150 per month
- (B). The Cost Accountant of Rounak Ltd. has computed labour turnover rates for the quarter ended 31st March, 2011 as 10%, 5% and 3% respectively under 'Flux method', 'Replacement method' and 'Separation method'.

If the number of workers replaced during that quarter is 30, find out the number of (i) workers left and discharged and (ii) workers recruited and joined.

Non Integrated Accounts

5. Cost Ledger of Beta Ltd. shows the following balances as on 31st March.

	Dr. ₹	Cr. ₹
Stores ledger control A/c	6,02,870	-
Work-in-progress ledger control A/c	2,44,730	-
Finished stock ledger control A/c	5,03,890	-
Manufacturing overhead control A/c		21,050
Cost ledger control A/c	-	<u>13,30,440</u>
	<u>13,51,490</u>	<u>13,51,490</u>

During the next three months, the transactions that took place is as follows:

	₹
Finished product (at cost)	4,21,670
Manufacturing overhead incurred	1,83,020
Raw materials purchased	2,46,000

Factory wages	1,01,060
Indirect labour	43,330
Cost of sales	3,71,780
Materials issued to production	2,54,630
Sales returned at cost	10,760
Materials returned to suppliers	5,800
Manufacturing overhead charged to production	1,54,400

You are required to write up the accounts and schedule the balances stating what each balance represents.

Process Costing

6. A factory has two production processes. Normal loss in each process is 10% and scrapped units sell for ₹ 0.50 each from process 1 and ₹ 3 each from process 2. Relevant information for costing purposes relating to period 5 is as follows:

	Process 1		Process 2
Direct materials Units	2,000		1,250
Direct materials Cost	₹ 8,100		₹ 1,900
Direct labour	₹ 4,000		₹ 10,000
Production overhead	150% of direct labour cost		120% of direct labour cost
Output to process 2/finished goods	1,750 units		2,800 units
Actual production overhead		₹ 17,800	

Required:

Prepare the accounts for Process 1, Process 2, Scrap, Abnormal loss or Abnormal gain and Production overhead.

Standard Costing

7. The following standards have been set to manufacture a product:

Direct materials:	₹
2 units of P at ₹ 4 per unit	8.00
3 units of Q at ₹ 3 per unit	9.00
15 units of R at ₹ 1 per unit	<u>15.00</u>
	32.00
Direct labour 3 hours @ ₹ 8 per hour	<u>24.00</u>
Total standard prime cost	<u>56.00</u>

The company manufactured and sold 6,000 units of the product during the year.

Direct material costs were as follows:

12,500 units of P at ₹ 4.40 per unit

18,000 units of Q at ₹ 2.80 per unit

88,500 units of R at ₹ 1.20 per unit

The company worked 17,500 direct labour hours during the year. For 2,500 of these hours the company paid at ₹ 12 per hour while for the remaining the wages were paid at the standard rate.

Calculate material price, usage variances, labour rate, and efficiency variances.

Budgetary Control

8. Cambridge School has a total of 150 students consisting of 5 sections with 30 students per section. The school plans for a picnic around the city during the week-end to places such as Alipur zoo, the Niko Park, Birla planetarium etc. A private transport operator has come forward to lease out the buses for taking the students. Each bus will have a maximum capacity of 50 (excluding 2 seats reserved for the teachers accompanying the students). The school will employ two teachers for each bus, paying them an allowance of ₹ 50 per teacher. It will also lease out the required number of buses. The following are the other cost estimates:

	Cost per student
Breakfast	₹ 5
Lunch	10
Tea	3
Entrance fee at zoo	2

Rent ₹ 650 per bus.

Special permit fee ₹ 50 per bus.

Block entrance fee at the planetarium ₹ 250.

Prizes to students for games ₹ 250.

No cost are incurred in respect of the accompanying teachers (except the allowance of ₹ 50 per teacher).

You are required to prepare:

- A flexible budget estimating the total cost for the levels of 30, 60, 90, 120 and 150 students. Each item of cost is to be indicated separately.
- Compare the average cost per student at these levels.
- What will be your conclusions regarding the break-even level of student if the school proposes to collect ₹ 45 per student?

Marginal Costing

9. An Automobile manufacturing company produces different models of cars. The budget in respect of model 1000 for the month of September, 2011 is as under:

Budgeted output		40,000 units
Variable Costs:		(₹ Lakhs)
Materials	264	
Labour	52	
Direct expenses	<u>124</u>	440
Fixed costs:		
Specific fixed costs	90.00	
Allocated fixed costs	<u>112.50</u>	<u>202.50</u>
Total costs		642.50
Add: Profit		<u>57.50</u>
Sales		<u>700.00</u>

Calculate:

- Profit with 10% increase in selling price with a 10% reduction in sales volume.
- Volume to be achieved to maintain the original profit after a 10% rise in material costs, at the originally budgeted selling price per unit.

Overheads

10. A company has two production departments and two service departments. The data relating to a period are as under:

	<u>Production Departments</u>		<u>Service Departments</u>	
	PD ₁	PD ₂	SD ₁	SD ₂
Direct materials(₹)	80,000	40,000	10,000	20,000
Direct wages(₹)	95,000	50,000	20,000	10,000
Overheads(₹)	80,000	50,000	30,000	20,000
Power requirement at normal capacity operations(Kwh.)	20,000	35,000	12,500	17,500
Actual power consumption during the period(Kwh.)	13,000	23,000	10,250	10,000

The power requirements of these departments are met by a power generation plant. The said plant incurred an expenditure, which is not included above, of ₹ 1,21,875 out of

	PD ₁	PD ₂	SD ₁	SD ₂
SD ₁	50%	40%	-----	10%
SD ₂	60%	20%	20%	---

- (i) Apportion the power generation plant costs to the four departments.
- (ii) Re-apportion service department costs to production departments.
- (iii) Calculate the overhead rates per direct labour hour of production departments, given that the direct wage rates of PD₁ and PD₂ are ₹ 5 and ₹ 4 per hour respectively.

11. From the records of a manufacturing company, the following budgeted details are available:

	₹	₹
Direct Materials		1,99,000
Direct Wages:		
Machine Shop (12,000 hours)	63,000	
Assembly Shop (10,000 hours)	48,000	1,11,000
Works Overhead:		
Machine Shop	88,200	
Assembly Shop	51,800	1,40,000
Administrative Overhead		90,000
Selling Overhead		81,000
Distribution Overhead		62,100

- Prepare a Schedule of Overhead Rates from the figures available stating the basis of overhead recovery rates used under the given circumstances.
- Work out a Cost Estimate for the following job based on overhead calculated on above basis.

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Direct labour: (On the basis of hourly rate
For machine shop and assembly shop)

Machine shop 30 hours
Assembly shop 42 hours

Contract Costing

12. Deluxe Limited undertook a contract for ₹ 5, 00,000 on 1st April 2010. On 31st March 2011 when the accounts were closed, the following details about the contract were gathered:

	₹
Materials purchased	1,00,000
Wages paid	45,000
General expenses	10,000
Plant purchased	50,000
Material in hand 31.3.2011	25,000
Wages accrued 31.3.2011	5,000
Work certified	2,00,000
Cash received	1,50,000
Work uncertified	15,000
Depreciation of plant	5,000

The contract contained an escalation clause, which read as follows:

“In the event of increase(s) of prices of materials and rates of wages by more than 5%, the contract price would be increased accordingly by 25% of the rise of the cost of materials and wages beyond 5% in each case.”

It was found that since the date of signing the agreement, the prices of materials and wage rates increased by 25%. The value of the work certified does not take into account the effect of the above clause.

Prepare the contract account. The workings should form part of your answer.

Basic Concepts of Cost Accounting

13. (a) ‘Cost Accounting has become an essential tool of Management of a business concern’. Explain the statement.
- (b) Discuss the factors which should be considered before installing a Costing system in a manufacturing firm.

SUGGESTED ANSWERS/HINTS

1. (i) Total Sales = $2,40,000 \times \frac{100}{40} = ₹ 6,00,000$
 Contribution = $6,00,000 \times 30\% = ₹ 1,80,000$
 Profit = $M/S \times P/V \text{ ratio} = 2,40,000 \times 30\% = ₹ 72,000$
 Fixed cost = Contribution – Profit
 $= 1,80,000 - 72,000 = ₹ 1,08,000$
- (1) Break-even Sales = $\frac{F}{P/V \text{ ratio}} = \frac{1,08,000}{30\%} = ₹ 3,60,000$
- (2) Profit = (Sales $\times$ P/V ratio) – Fixed cost
 $= (9,00,000 \times 30\%) - 1,08,000 = ₹ 1,62,000$
- (ii) Usage must have been higher than standard because the usage variance is adverse.
- Standard price per kilogram of material: $\frac{₹ 23,124}{₹ 5640} = ₹ 4.10$
- Usage variance is equal to the excess usage multiplied by the standard price per kg of material
- Excess usage: $\frac{₹ 246}{₹ 4.1} = 60 \text{ kg.}$
- So, Standard usage: $5640 \text{ kg} - 60 \text{ kg} = 5580 \text{ kg.}$
- (iii) Cost Centre may be defined as a location, person, or an item of equipment for which cost may be ascertained and used for the purpose of cost control. In such a responsibility centre, the manager is responsible for costs only. Cost Unit is a unit of product, service or time (or combination of these) in relation to whom the costs may be ascertained or expressed.
- (iv) Period costs are costs which are not assigned to products but are charged as expenses against revenue of the period in which they are incurred. All non manufacturing costs such as selling and distribution expenses, administration expenses etc are recognised as period costs. Product costs are those costs which are associated with the purchase and sale of goods (in the case of merchandise inventory). In a manufacturing scenario, inventoriable costs are known as Product Costs.
- (v) Absorption costing is a method of inventory costing in which the variable manufacturing costs and all fixed manufacturing costs are included as inventoriable costs. Marginal costing can be defined as "the ascertainment of marginal costs and

of the effect on profit of changes in volume or type of output by differentiating between fixed and variable costs" In a Marginal costing system, fixed costs are not included as inventoriable cost.

2. (a)

Order size (tons)	400	500	1,000	2,000	3,000
No. of order $\frac{\text{Annual requirement}}{\text{Order size}}$ [see Note]	13	10	5	3	2
Average stock $\frac{\text{Order size}}{2}$	200	250	500	1,000	1,500
Price per ton	1,200	1,180	1,160	1,140	1,120
Average stock value (average stock $\times$ price per ton)	<u>2,40,000</u>	<u>2,95,000</u>	<u>5,80,000</u>	<u>11,40,000</u>	<u>16,80,000</u>
	₹	₹	₹	₹	₹
Cost of material (5,000 $\times$ price per ton)	60,00,000	59,00,000	58,00,000	57,00,000	56,00,000
Ordering cost (No. of orders $\times$ ₹1,200)	15,600	12,000	6,000	3,600	2,400
Stock carrying cost (20% of average stock value)	<u>48,000</u>	<u>59,000</u>	<u>1,16,000</u>	<u>2,28,000</u>	<u>3,36,000</u>
Total cost	<u>60,63,600</u>	<u>59,71,000</u>	<u>59,22,000</u>	<u>59,31,600</u>	<u>59,38,400</u>

The above table shows that the lowest total cost is ₹ 59, 22,000, i.e., when the quantity ordered is 1,000 tons. This is, therefore, the most economical purchase level.

Note: When calculating the number of orders if a fraction comes, the next whole number has to be considered.

$$(b) \text{ EOQ} = \sqrt{\frac{2AS}{C_c}}$$

Where A = consumption per annum in units

S = ordering cost per order

C_c = carrying cost of one unit of stock for one year

$$= \sqrt{\frac{2 \times 5,000 \times ₹1,200}{20\% \text{ of } ₹1,500}} = 200 \text{ tons.}$$

3. Statement of Earnings

	Sachin	Sourav	Rahul
(i) Production (units)	80	100	120
(ii) Time allowed (Hours @ 10 pieces per hour)	8	10	12
(iii) Piece rate (₹4 ÷ 10)	0.40	0.40	0.40
(iv) Time taken (Assumed 1 day = 8 hours)	8	8	8
(v) Time saved (Time allowed-Time Taken)	0	2	4
Earnings per day (₹)			
(a) Straight Piece Rate	80 × 0.4	100 × 0.4	120 × 0.4
	= 32.00	= 40.00	= 48.00
(b) Halsey Premium Bonus (See Note)	32.00	36.00	40.00
(c) Rowan Premium Bonus (See Note)	32.00	38.40	42.60
Effective Rate of Earning per hour (Earning ÷ Hours)			
	₹	₹	₹
(a) Straight Piece Rate	4.00	5.00	6.00
(b) Halsey Premium Bonus	4.00	4.50	5.00
(c) Rowan Premium Bonus	4.00	4.80	5.33

Notes:

1. Halsey Premium Bonus

Wages = (Time taken + 50% of time saved) × Time rate

$$\text{Sachin} = (8 + 0) \times ₹ 4 = ₹ 32$$

$$\text{Sourav} = (8 + 1) \times ₹ 4 = ₹ 36$$

$$\text{Rahul} = (8 + 2) \times ₹ 4 = ₹ 40$$

2. Rowan Premium Bonus

$$\text{Wages} = \text{Time taken} \times \text{Rate} + \frac{\text{Time saved}}{\text{Time allowed}} \times \text{Time taken} \times \text{Rate}$$

$$\text{Sachin} = 8 \times 4 + \frac{0}{8} \times 8 \times 4 = ₹ 32$$

$$\text{Sourav} = 8 \times 4 + \frac{2}{10} \times 8 \times 4 = ₹ 38.40$$

$$\text{Rahul} = 8 \times 4 + \frac{4}{12} \times 8 \times 4 = ₹ 42.67$$

4. (A) Statement of Monthly Remuneration

Worker	Standard production (units)	Actual production (units)	% of actual to standard production	Piece wages @ ₹ 0.25	Bonus	D.A.	Total earnings
X	4,000	3,400	85%	850	₹ 50*	₹ 150	₹ 1,050
Y	4,000	3,000	75%	750	-	₹ 150	₹ 900
Z	4,000	3,800	95%	950	₹ 150**	₹ 150	₹ 1,250

*Additional 5% (85% - 80%), So Bonus is ₹ 10 × 5 = ₹ 50.

**Additional 15% (95% - 80%), So Bonus is ₹ 10 × 15 = ₹ 150.

(B) Average number of workers on payroll:

$$\text{Labour turnover rate (Replacement method)} = \frac{\text{Number of workers replaced}}{\text{Average number on payroll}} \times 100$$

$$\text{or, } \frac{5}{100} = \frac{30}{\text{Average number on payroll}}$$

$$\text{or, Average number of workers on payroll} = \frac{30 \times 100}{5} = 600.$$

(i) Number of workers left and discharged:

$$\text{Labour turnover rate (Separation method)} = \frac{\text{Number of workers separated}}{\text{Average number on payroll}} \times 100$$

$$\text{or, } \frac{3}{100} = \frac{\text{Number of workers separated}}{600}$$

$$\text{or, Number of workers separated (i.e., left and discharged)} = \frac{3 \times 600}{100} = 18.$$

(ii) Number of workers recruited and joined:

$$\text{Labour turnover rate (Flux method)} = \frac{\text{Number separated} + \text{Number recruited and joined}}{\text{Average number on payroll}} \times 100$$

$$\text{or, } \frac{10}{100} = \frac{18 + \text{Number of workers recruited and joined}}{600}$$

$$\text{or, Number of workers recruited and joined} = \frac{600 \times 10}{100} - 18 = 42.$$

5. **COST LEDGER**

<i>Dr.</i>		Cost Ledger Account		<i>Cr.</i>
<i>Particulars</i>	₹	<i>Particulars</i>	₹	
To Stores ledger control A/c	5,800	By Balance b/d	13,30,440	
To Finished stock ledger control A/c	3,71,780	By Stores ledger control A/c	2,46,000	
To Balance c/d	15,37,030	By Wages control A/c	1,01,060	
		By Works overhead control A/c	43,330	
		By Works overhead control A/c	1,83,020	
		By Finished stock ledger control A/c	10,760	
	<u>19,14,610</u>		<u>19,14,610</u>	
		By Balance b/d	15,37,030	

<i>Dr.</i>		Stores Ledger Control Account		<i>Cr.</i>
<i>Particulars</i>	₹	<i>Particulars</i>	₹	
To Balance b/d	6,02,870	By Cost ledger control A/c	5,800	
To Cost ledger control A/c	2,46,000	By Work-in-progress control A/c	2,54,630	
		By Balance c/d	5,88,440	
	<u>8,48,870</u>		<u>8,48,870</u>	
To Balance b/d	5,88,440			

<i>Dr.</i>		Manufacturing Overhead Control Account		<i>Cr.</i>
<i>Particulars</i>	₹	<i>Particulars</i>	₹	
To Cost ledger control A/c	1,83,020	By Balance b/d	21,050	
To Cost ledger control A/c	43,330	By Work-in-progress control A/c	1,54,400	
		By Balance c/d	50,900	
	<u>2,26,350</u>		<u>2,26,350</u>	
To Balance b/d	50,900			

Dr.		Work-in-progress Control Account		Cr.	
Particulars	₹	Particulars	₹		
To Balance b/d	2,44,730	By Finished stock ledger control A/c	4,21,670		
To Wages control A/c	1,01,060	By Balance c/d	3,33,150		
To Stores ledger control A/c	2,54,630				
To Works overhead control A/c	<u>1,54,400</u>				
	<u>7,54,820</u>				<u>7,54,820</u>
To Balance b/d	<u>3,33,150</u>				

Dr.		Finished Stock Ledger Control Account		Cr.	
Particulars	₹	Particulars	₹		
To Balance b/d	5,03,890	By Cost ledger control A/c	3,71,780		
To Work-in-progress	4,21,670	By Balance c/d	5,64,540		
To Cost ledger control A/c	<u>10,760</u>				
	<u>9,36,320</u>				<u>9,36,320</u>
To Balance b/d	5,64,540				

Trial Balance

	Dr. Rs.	Cr. Rs.
Cost ledger control account	-	15,37,030
Stores ledger control account	5,88,440	-
Mfg. overhead control account	50,900	-
W.I.P. control account	3,33,150	-
Finished stock ledger control account	<u>5,64,540</u>	
	<u>15,37,030</u>	<u>15,37,030</u>

6. Output and losses

	Process 1 Units	Process 2 Units
Output	1,750	2,800
Normal loss (10% of input)	200	300

Abnormal loss	50	-
Abnormal gain	<u>-</u>	<u>(100)</u>
	<u>2,000</u>	<u>3,000*</u>

* 1,750 units from Process 1 + 1,250 units input to process.

Cost per unit of output and losses

	Process 1 ₹		Process 2 ₹
Cost of input			
- Material	8,100		1,900
- from process 1	-	(1,750 ´ ₹10)	17,500
- Labour	4,000		10,000
- Overhead (150% ´ ₹ 4,000)	<u>6,000</u>	(120% ´ ₹ 10,000)	<u>12,000</u>
	18,100		41,400
Less scrap value (200 ´ ₹ 0.50) of normal loss	<u>(100)</u>	(300 ´ ₹ 3)	<u>(900)</u>
	18,000		40,500
Expected output			
90% of 2,000	1,800		
90% of 3,000			2,700
Cost per unit			
₹ 18,000 ÷ 1,800	₹ 10		
₹ 40,500 ÷ 2,700			₹ 15

Total cost of output and losses

	Process 1 ₹		Process 2 ₹
Output (1,750 ´ ₹ 10)	17,500	(2,800 ´ ₹15)	42,000
Normal loss (200 ´ ₹ 0.50)*	100	(300 ´ ₹ 3)*	900
Abnormal loss (50 ´ ₹ 10)	<u>500</u>		<u>-</u>
	<u>18,100</u>		<u>42,900</u>
Abnormal gain	<u>-</u>	(100 ´ ₹ 15)	<u>(1,500)</u>
	<u>18,100</u>		<u>41,400</u>

* Normal loss is valued at scrap value only.

Complete accounts

PROCESS 1 ACCOUNT

	Units	₹		Units	₹
Direct material	2,000	8,100	Scrap a/c (normal loss)	200	100
Direct labour		4,000	Process 2 a/c	1,750	17,500
Production overhead a/c		<u>6,000</u>	Abnormal loss a/c	<u>50</u>	<u>500</u>
	<u>2,000</u>	<u>18,100</u>		<u>2,000</u>	<u>18,100</u>

PROCESS 2 ACCOUNT

	Units	₹		Units	₹
Direct materials					
From process 1	1,750	17,500	Scrap a/c (normal loss)	300	900
Added materials	1,250	1,900	Finished goods a/c	2,800	42,000
Direct labour		10,000			
Production overhead		12,000			
	3,000	41,400			
Abnormal gain	<u>100</u>	<u>1,500</u>			
	<u>3,100</u>	<u>42,900</u>		<u>3,100</u>	<u>42,900</u>

ABNORMAL LOSS ACCOUNT

	₹		₹
Process 1 (50 units)	500	Scrap a/c: sale of scrap of extra loss (50 units)	25
		Profit and loss a/c	<u>475</u>
	<u>500</u>		<u>500</u>

ABNORMAL GAIN ACCOUNT

	₹		₹
Scrap a/c (loss of scrap revenue due to abnormal gain, 100 units @ ₹ 3)	300	Process 2 abnormal gain (100 units)	1,500
Profit and loss a/c	<u>1,200</u>		
	<u>1,500</u>		<u>1,500</u>

SCRAP ACCOUNT

	₹		₹
Scrap value of normal loss		Cash a/c – cash received	
Process 1 (200 units)	100	Loss in process 1(250 units)	125
Process 2 (300 units)	900	Loss in process 2 (200 units)	600
Abnormal loss a/c (process 1)	<u>25</u>	Abnormal gain a/c (process 2)	<u>300</u>
	<u>1,025</u>		<u>1,025</u>

PRODUCTION OVERHEAD ACCOUNT

	₹		₹
Overhead incurred	17,800	Process 1 a/c	6,000
Over-absorbed overhead a/c (or P & L a/c)	<u>200</u>	Process 2 a/c	12,000
	<u>18,000</u>		<u>18,000</u>

7. Standard Quantity of Materials for Actual Output:

P	6,000 ´ 2	12,000 units
Q	6,000 ´ 3	18,000 units
R	6,000 ´ 15	90,000 units

Standard hours for Actual Output:

6,000 ´ 3	18,000 hours
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Material price Variance:

(Standard Price for actual output - Actual Price) ´ Actual Quantity		₹
P	(₹ 4.00 - ₹ 4.40) ´ 12,500	5,000 (A)
Q	(₹ 3.00 - ₹ 2.80) ´ 18,000	3,600 (F)
R	(₹ 1.00 - ₹ 1.20) ´ 88,500	<u>17,700(A)</u>
		<u>19,100(A)</u>

Material Usage Variance:

(Standard Usage - Actual Usage) ´ Standard Price

P	(12,000 - 12,500) ´ ₹ 4.00	2,000 (A)
Q	(18,000 - 18,000) ´ ₹ 3.00	Nil
R	(90,000 - 88,500) ´ ₹ 1.00	<u>1,500 (F)</u>
		<u>500 (A)</u>

Labour Rate Variance:

(Standard Rate - Actual Rate) ´ Actual hours

(₹ 8.00 - ₹ 12.00) ´ 2,500 10,000 (A)

(₹ 8.00 - ₹ 8.00) ´ 15,000 Nil

10,000 (A)

Labour Efficiency Variance:

(Standard hours - Actual hours) ´ Standard Rate

(18,000 - 17,500) ´ ₹ 8.00 4,000 (F)

8. (a) Flexible Budget for different levels

	₹	₹	₹	₹	₹
No. of Students	<u>30</u>	<u>60</u>	<u>90</u>	<u>120</u>	<u>150</u>
<u>VARIABLE COST</u>					
Breakfast	150	300	450	600	750
Lunch	300	600	900	1,200	1,500
Tea	90	180	270	360	450
Entrance fee	<u>60</u>	<u>120</u>	<u>180</u>	<u>240</u>	<u>300</u>
Sub-total (A)	<u>600</u>	<u>1,200</u>	<u>1,800</u>	<u>2,400</u>	<u>3,000</u>
Variable cost/unit	20	20	20	20	20
<u>SEMI-VARIABLE COST</u>					
Bus rent	650	1,300	1,300	1,950	1,950
Special permit fee	50	100	100	150	150
Allowance for teachers	<u>100</u>	<u>200</u>	<u>200</u>	<u>300</u>	<u>300</u>
Sub-total (B)	<u>800</u>	<u>1,600</u>	<u>1,600</u>	<u>2,400</u>	<u>2,400</u>
<u>FIXED COST</u>					
Block entrance fee	250	250	250	250	250
Prize to students	<u>250</u>	<u>250</u>	<u>250</u>	<u>250</u>	<u>250</u>
Sub total(C)	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>
Total cost (A + B + C)	<u>1,900</u>	<u>3,300</u>	<u>3,900</u>	<u>5,300</u>	<u>5,900</u>

(b) Cost per student 63.33 55.00 43.33 44.17 39.33

(c) Break-even level

Collection per students = ₹ 45

Less Variable Cost 20

Contribution 25

Since semi-fixed costs relate to a block of 50 students, the fixed and semi-variable cost for three level will be:

Level of Student	Upto 50	51–100	101–150
Fixed + Semi-variable cost	₹1,300	2,100	2,900
Contribution per unit	25	25	25
Break Even level of students	52	84	116

9.

		₹
Present selling price	(₹ 700 lakhs /40,000 units)	1,750
Add: 10% increase	(1,750 x 10/100)	<u>175</u>
Revised selling price		<u>1,925</u>

		Units
Present sales volume		40,000
Less: 10% decrease	(40,000 x 10/100)	<u>4,000</u>
Revised sales volume		36,000

Revised sales revenue = 36,000 unit x ₹ 1,925 = ₹ 693 lakhs

		(₹)
Materials		660
Labour		130
Direct expenses		<u>310</u>
Total variable cost		<u>1,100</u>

Profitability Statement		(₹ Lakhs)
Sales		693.00
Less: Variable cost	(36,000 units ´ ₹1,100)	<u>396.00</u>
Contribution		297.00
Less: Fixed cost		202.50
Profit		94.50
Materials	(₹ 660 + 10% of ₹ 660)	726
Labour		130
Direct expenses		<u>310</u>
Total variable cost p.u.		<u>1,166</u>

Calculation of sales Volume to be achieved to maintain the original profit of ₹ 57.50 lakhs.

	(₹ p.u.)
Selling price	1,750
Less: Variable cost	<u>1,166</u>
Contribution p.u.	<u>584</u>

$$\text{Desired Sales} = \frac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution p.u.}} = \frac{\text{₹ } 202.50 + \text{₹ } 57.50}{\text{₹ } 584} = 44,521 \text{ Units.}$$

10. (i) Apportionment of Power Generation Plant Costs

Items of Expenses	Basis of Apportionment	Total	Production Departments		Service Departments	
			PD ₁	PD ₂	SD ₁	SD ₂
		₹	₹	₹	₹	₹
Fixed Expenses	Power requirements (kwh.) at normal capacity (8 : 14 : 5 : 7)	37,500	8,824	15,441	5,515	7,720
Variable Expenses	Actual power consumption (kwh.) (13 : 23 : 10.25 : 10)	84,375	19,500	34,500	15,375	15,000
		1,21,875	28,324	49,941	20,890	22,720

(ii) Overhead Distribution Summary and Re-apportionment of Service Department Costs

	Total	Production Departments		Service Departments	
		PD ₁	PD ₂	SD ₁	SD ₂
	₹	₹	₹	₹	₹
Power Generation Cost	1,21,875	28,324	49,941	20,890	22,720
Direct Materials	30,000	---	----	10,000	20,000
Direct Wages	30,000	---	----	20,000	10,000
Other Overheads	1,80,000	80,000	50,000	30,000	20,000
	3,61,875	1,08,324	99,941	80,890	72,720
Reapportionment:					
SD ₁ (5 : 4 : 1)		40,445	32,356	(-)80,890	8,089
SD ₂ (6 : 2 : 2)		48,485	16,162	16,162	(-)80,809
SD ₁ (5 : 4 : 1)		8,081	6,465	(-) 16,162	1,616
SD ₂ (6 : 2 : 2)		970	323	323	(-)1,616
SD ₁ (5 : 4 : 1)		162	129	(-) 323	32
SD ₂ (6 : 2)		24	8	----	(-) 32
Total	3,61,875	2,06,491	1,55,384	----	-----

(iii) **Calculation of Overhead Rates**

		PD ₁	PD ₂
Direct Wages	(₹)	95,000	50,000
Wages Rate per Hour	(₹)	5	4
Direct Labour Hours (Direct wages , Wage rate)	(Hours)	19,000	12,500
Overheads	(₹)	2,06,431	1,55,384
Overhead Rate per Hour (Overheads , Labour hours)	(₹)	10.87	12.43

11. (a) **Job Cost Sheet for the period.....**

			₹
Direct materials			1,99,000
Direct wages:			
Machine shop		63,000	
Assembly shop		<u>48,000</u>	<u>1,11,000</u>
	Prime Cost		3,10,000
Works overhead:			
Machine shop		88,200	
Assembly shop		<u>51,800</u>	<u>1,40,000</u>
	Work Cost		4,50,000
Administration overhead			<u>90,000</u>
	Cost of Production		5,40,000
Selling overhead			81,000
Distribution overhead			<u>62,100</u>
	Total Cost		<u>6,83,100</u>

Schedule of Overhead Rate

- (i) Works Overhead : Hourly rate = (Overhead amount. ÷ Hours)
Machine shop = $(88,200 \div 12,000) = ₹ 7.35$ per hour
Assembly shop = $(51,800 \div 10,000) = ₹ 5.18$ per hour
- (ii) Administrative Overhead as a % of works cost

$$= \frac{90,000}{4,50,000} \times 100 = 20\%$$
- (iii) Selling and distribution overhead as % of works cost

$$= \frac{81,000 + 62,100}{4,50,000} \times 100 = 31.80\%$$

Labour hour rates are calculated as under:

Machine shop = ₹ 63,000 ÷ 12,000 hrs. = ₹ 5.25

Assembly shop = ₹ 48,000 ÷ 10,000 hrs. = ₹ 4.80

(b) Cost Estimate for Job

Direct Materials	₹	₹
(i) 25 kg @ ₹ 16.80 per kg	420	
(ii) 15 kg @ ₹ 20 per kg	<u>300</u>	720.00
Direct Labour		
Machine shop (30 hrs. @ ₹ 5.25)	157.50	
Assembly shop (42 hrs. @ 4.80)	<u>201.60</u>	<u>359.10</u>
Prime Cost		1079.10
Works Overhead		
Machine shop (30 hours @ ₹ 7.35)	220.50	
Assembly shop (42 hours @ 5.18)	<u>317.56</u>	<u>438.06</u>
Works Cost		1517.16
Administration overhead (20% of works cost)		<u>303.43</u>
Cost of Production		1820.59
Selling and distribution cost (31.8% of works cost)		<u>482.46</u>
Total Estimated Cost		<u>2303.05</u>

12.

Deluxe Limited
Contract account for the year ended 31st March 2011

Dr.		₹			Cr. ₹
To Materials purchased		1,00,000	By Work-in-progress c/d		
To Wages paid	45,000		Work certified	2,00,000	
Add: Wages accrued	<u>5,000</u>	50,000	Work uncertified	15,000	
To General expenses		10,000	Effect of escalation clause	<u>5,000</u>	2,20,000
To Depreciation of plant		5,000	By Materials in hand c/d		25,000
To Notional profit c/d		<u>80,000</u>			
		<u>2,45,000</u>			<u>2,45,000</u>
To Profit and loss A/c		20,000	By Notional profit b/d		80,000
To Work-in-progress c/d (Profit in reserve)		<u>60,000</u>			
		<u>80,000</u>			<u>80,000</u>

1.4.2011			1.4.2011		
To Work-in-progress b/d			By Work-in-progress b/d		60,000
Work certified	2,00,000		(profit in reserve)		
Work uncertified	15,000				
Effect of escalation clause	<u>5,000</u>	2,20,000			
To materials in hand b/d		25,000			

Working notes**(i) Ascertainment of effect of escalation clause:**

	Total increase 25% ₹	Increase up to 5% ₹	Increase beyond 5% ₹
Materials:			
Effect of increased price			
$(₹ 1,00,000 - ₹ 25,000) \times \frac{25}{125}$	15,000	3,000	12,000
Wages:			
Effect of increased wage rates:			
$₹ 50,000 \times \frac{25}{125}$	10,000	2,000	8,000
Total increase	25,000	5,000	20,000

Increase in value of work done (certified & uncertified)

to date: 25% of ₹ 20,000 = ₹ 5,000

(ii) Profit to be transferred to the profit and loss account:

Since the contract is between 1/4 and 1/2 complete, one-third of the notional profit, reduced by the proportion of cash received to work certified, is to be transferred as below:

$$= \frac{1}{3} \times \text{Notional profit} \times \frac{\text{Cash received}}{\text{Work certified}}$$

$$= \frac{1}{3} \times ₹ 80,000 \times \frac{₹ 1,50,000}{₹ 2,00,000} = ₹ 20,000.$$

13. (a) Importance of Cost Accounting to the management of a business concerns

Management of business concerns expects from Cost Accounting a detailed cost information in respect of its operations to equip their executives with relevant information required for planning, scheduling, controlling and decision making. To

be more specific, management expects from cost accounting - information and reports to help them in the discharge of the following functions :

- (a) *Control of material cost:* Cost of material usually constitute a substantial portion of the total cost of a product. Therefore, it is necessary to control it as far as possible. Such a control may be exercised by (i) Ensuring un-interrupted supply of material and spares for production. (ii) By avoiding excessive locking up of funds/capital in stocks of materials and stores. (iii) Also by the use of techniques like value analysis, standardisation etc. to control material cost.
 - (b) *Control of labour cost :* It can be controlled if workers complete their work within the standard time limit. Reduction of labour turnover and idle time too help us, to control labour cost.
 - (c) *Control of overheads :* Overheads consists of indirect expenses which are incurred in the factory, office and sales department ; they are part of production and sales cost. Such expenses may be controlled by keeping a strict check over them.
 - (d) *Measuring efficiency :* For measuring efficiency, Cost Accounting department should provide information about standards and actual performance of the concerned activity.
 - (e) *Budgeting :* Now-a-days detailed estimates in terms of quantities and amounts are drawn up before the start of each activity. This is done to ensure that a practicable course of action can be chalked out and the actual performance corresponds with the estimated or budgeted performance. The preparation of the budget is the function of Costing Department.
 - (f) *Price determination:* Cost accounts should provide information, which enables the management to fix remunerative selling prices for various items of products and services in different circumstances.
 - (g) *Curtailment of loss during the off-season:* Cost Accounting can also provide information, which may enable reduction of overhead, by utilising idle capacity during the off-season or by lengthening the season.
 - (h) *Expansion:* Cost Accounts may provide estimates of production of various levels on the basis of which the management may be able to formulate its approach to expansion.
 - (i) *Arriving at decisions:* Most of the decisions in a business undertaking involve correct statements of the likely effect on profits. Cost Accounts are of vital help in this respect. In fact, without proper cost accounting, decision would be like taking a jump in the dark, such as when production of a product is stopped.
- (b) Essential factors for installing a cost accounting system
- As in the case of every other form of activity, it should be considered whether it would be profitable to have a cost accounting system. The benefits from such a system must

exceed the amount to be spent on it. This would depend upon many factors including the nature of the business and the quality of the management. Management, which is prone to making decisions on the basis of pre-conceived notions without taking into account the information and data placed before it, cannot derive much benefit from a costing system. On the other hand management, which is in the habit of studying information thoroughly before making decisions, would require cost accounting system. Before setting up a system of cost accounting the under mentioned factors should be studied:

- (i) The objective of costing system, for example whether it is being introduced for fixing prices or for insisting a system of cost control.
- (ii) The areas of operation of business wherein the managements' action will be most beneficial. For instance, in a concern, which is anxious to expand its operations, increase in production would require maximum attention. On the other hand for a concern, which is not able, to sell the whole of its production the selling effort would require greater attention. The system of costing in each case should be designed to highlight, in significant areas, factors considered important for improving the efficiency of operations in that area.
- (iii) The general organisation of the business, with a view of finding out the manner in which the system of cost control could be introduced without altering or extending the organisation appreciably.
- (iv) The technical aspects of the concern and the attitude and behaviour that will be successful in winning sympathetic assistance or support of the supervisory staff and workmen.
- (v) The manner in which different variable expenses would be affected with expansion or cessation of different operations.
- (vi) The manner in which Cost and Financial accounts could be inter-locked into a single integral accounting system and in which results of separate sets of accounts, cost and financial, could be reconciled by means of control accounts.
- (vii) The maximum amount of information that would be sufficient and how the same should be secured without too much clerical labour, especially the possibility of collection of data on a separate printed form designed for each process; also the possibility of instruction as regards filling up of the forms in writing to ensure that these would be faithfully carried out.
- (viii) How the accuracy of the data collected can be verified? Who should be made responsible for making such verification in regard to each operation and the form of certificate that he should give to indicate the verification that he has carried out?
- (ix) The manner in which the benefits of introducing Cost Accounting could be explained to various persons in the concern, especially those in charge of production department and awareness created for the necessity of promptitude, frequency and regularity in collection of costing data.

PAPER – 4 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART II : FINANCIAL MANAGEMENT

QUESTIONS

1. Answer the following, supporting the same with reasoning/working notes:
 - (a) Mr. Khanna, a retired army officer, has opened an account with a reputed bank. He is required to pay four equal annual payments of ₹ 15,000 each in his deposit account that pays 8% interest per year. Find out the future value of annuity at the end of 4 years.
 - (b) Discuss briefly the concept of bridge finance.
 - (c) Explain briefly about commercial paper. Also discuss its advantages.
 - (d) Discuss in brief Gross Profit Margin ratio and its importance.
 - (e) Suppose Rama deposited ₹ 1,000 in an account that pays 12 percent interest, compounded quarterly. How much will be in the account after eight years if she makes no withdrawals?

Working Capital Management

2. Sunshine Company is attempting to establish a current assets policy. Fixed assets are ₹ 6,00,000 and the company plans to maintain a 50 per cent debt-to-assets ratio. The interest rate is 10 per cent on all debt. Three alternative current asset policies are under consideration: 40, 50, and 60 per cent of projected sales. The company expects to earn 15 per cent before interest and taxes on sales of ₹ 30 lakhs. The Company's effective tax rate is 40 per cent. You are required to determine the expected return on equity under each alternative?

Investment Decisions

3. Mahalaxmi Limited is considering to spend ₹ 4,00,000 on a project to manufacture and sell a new product.

The unit variable cost of the product is ₹ 6. It is expected that the new product can be sold at ₹ 10 per unit. The annual fixed cost (only cash) will be ₹ 20,000. The cost of capital of the company is 15%. The only uncertain factor is the volume of sales. To start with, the company expects to sell at least 40,000 units during the first year. Ignore taxation. You are required to calculate:

- (i) Net Present value of the project based on the sales expected during the first year and on the assumption that it will continue at the same level during the remaining years.
- (ii) The minimum volume of sales required to justify the project.

Financing Decisions

4. Alpha Limited has the following capital structure:

Equity Share Capital (₹ 10 each)	₹ 150 lakhs
10% Debentures	₹ 100 lakhs
Retained Earnings	₹ 50 lakhs

Other Information:

Market Price per Equity Share	₹ 49
Price-Earnings Ratio	7
Income Tax Rate	30%

Alpha Limited is considering an expansion plan and needs ₹ 100 lakhs. If expansion programme is undertaken, company feels that there will be 25 percent increase in present earnings before interest and tax. The company has the following alternatives available for raising funds required for expansion:

- I. Issue equity shares at ₹ 50 each.
- II. Issue 12 percent debentures for ₹ 50 lakhs and for the balance, equity shares of ₹ 50 each.
- III. Issue 9 percent preference shares for ₹ 60 lakhs and for the balance, equity shares of ₹ 50 each.

You are required to advise Alpha Limited regarding the best alternative assuming price-earnings ratio 7.50, 7.00 and 7.25 respectively for these alternatives.

Financing Decisions

5. The following information is given for Gamma Limited. You are required to compute the weighted average cost of capital of the company.

(i) Total capital employed	₹ 20,00,000
(ii) Debt-Equity Mix	40% /60%
(iii) Cost of Debt:	
Upto ₹ 4,80,000	10% (Before Tax)
Beyond ₹ 4,80,000	16% (Before Tax)
(iv) Earning Per Share	₹ 6
(v) Dividend Payout	50% of earnings
(vi) Expected Growth Rate in dividend	10%
(vii) Current Market Price Per Share	₹ 66
(viii) Tax Rate	50%

Financial Analysis and Planning

6. You are required to arrange and redraft the following Cash Flow Statement of Beta Limited in proper order keeping in mind the requirements of AS 3:

	₹ (in lakhs)	₹ (in lakhs)
Net Profit		60,000
Add: Sale of Investments		70,000
Depreciation on Assets		11,000
Issue of Preference Shares		9,000
Loan raised		4,500
Decrease in Stock		12,000
		1,66,500
Less : Purchase of Fixed Assets	65,000	
Decrease in Creditors	6,000	
Increase in Debtors	8,000	
Exchange gain	8,000	
Profit on sale of investments	12,000	
Redemption of Debenture	5,700	
Dividend paid	1,400	
Interest paid	<u>945</u>	<u>1,07,045</u>
		59,455
Add: Opening cash and cash equivalent		12,341
Closing cash and cash equivalent		71,796

Financing Decisions

7. The net operating income of Ganesha Limited is ₹18,00,000. The capital structure of the company has 10 percent debentures of ₹ 32,00,000 in addition to equity share capital. Overall cost of capital of the company is 16 percent. You are required to compute:
- Value of Ganesha Limited by using Net Operating Income (NOI) Approach, and
 - Cost of Equity Share Capital.

Investment Decisions

8. You are a financial analyst for Samtech Electronics Limited. The director of finance has asked you to analyse two proposed capital investments, Projects X and Y. Each project has a cost of ₹ 10,000, and the cost of capital for each project is 12 per cent. The project's expected net cash flows are as follows:

Year	Expected Net Cash flows	
	Project X	Project Y
	₹	₹
0	(10,000)	(10,000)
1	6,500	3,500
2	3,000	3,500
3	3,000	3,500
4	1,000	3,500

- Calculate each project's payback period, net present value (NPV), internal rate of return (IRR), and modified internal rate of return (MIRR).
- Which project or projects should be accepted if they are independent?
- Which project should be accepted if they are mutually exclusive?

Financial Analysis and Planning

- Using the following data of Megatech Limited, you are required to complete the given Balance-Sheet:

Gross Profit	₹ 64,800
Shareholders' fund	₹ 7,20,000
Gross profit margin	20%
Credit sales to Total sales	80%
Total Assets Turnover	0.3 times
Inventory Turnover	4 times
(on the basis of cost of goods sold)	
Average collection period	20 days
(A year may be taken as 360 days)	
Current Ratio	1.8
Long Term Debt to Equity	40%

Balance Sheet

Liabilities	₹	Assets	₹
Shareholders' Fund	-	Cash	-
Long-term Debt	-	Debtors	-
Creditors	-	Inventory	-
		Fixed Assets	-
Total (₹)	-	Total (₹)	-

Time Value of Money

10. Finmin Limited offers a fixed deposit scheme whereby ₹ 20,000 matures to ₹ 25,250 after two years on a half yearly compounding basis. If the company desires to amend the scheme by compounding interest every quarter, you are required to determine the revised maturity value?

Working Capital Management

11. The following annual figures relate to Fibroplast Limited:

	₹
Sales (at 3 months credit)	90,00,000
Materials consumed (Suppliers extend 1½ month's credit)	22,50,000
Wages paid (one month in arrear)	18,00,000
Manufacturing expenses outstanding at the end of year (cash expenses are paid on month in arrear)	2,00,000
Total administration expenses (Cash expenses are paid one month in arrear)	6,00,000
Sales promotion expenses for the year (Paid quarterly in advance)	12,00,000

The company sells its products on gross profit of 25 per cent assuming depreciation as a part of cost of production. It keeps two month's stock of raw materials as inventory. It keeps cash balance of ₹ 2,50,000.

You are required to work out the working capital requirement of the company on cash-cost basis. Ignore work-in-progress.

12. Differentiate between the following:
- Investment, Financing and Dividend Decisions
 - Funds Flow Statement and Cash Flow Statement
 - Leverage Ratios and Coverage Ratios.
13. Write short notes on the following:
- Growth of Venture Capital Financing in India
 - External Commercial Borrowings
 - Forms of Bank Credit.

SUGGESTED ANSWERS/HINTS

1. (a) Computation of Future Value of Annuity

$$\begin{aligned}
 \text{FVA} &= R \times \frac{(1+i)^n - 1}{i} \\
 &= ₹ 15,000 (4.507) \\
 &= ₹ 67,605
 \end{aligned}$$

- (b) **Bridge Finance:** Bridge Finance refers to loans taken by a company normally from commercial banks for a short period because of pending disbursement of loans sanctioned by financial institutions. Normally, it takes time for financial institutions to disburse loans to companies. Once the loans are approved by the lending institutions, then the companies, in order not to lose time in starting their projects, arrange short-term loans from commercial banks.

The bridge loans are repaid/adjusted out of the term loans as and when disbursed by the concerned institutions. They are secured by hypothecating movable assets, personal guarantees and demand promissory notes. The rate of interest on bridge loans is higher as compared to term loans.

- (c) **Commercial Paper (CP):** It is unsecured promissory note issued by a firm to raise funds for a short period. It enables highly rated corporate borrowers for short-term borrowings and provides an additional financial instrument to investors with freely negotiable interest rate.

Advantages of CP

- (i) It is sold on unsecured basis and there are no restrictive conditions.
- (ii) Maturing CP can be repaid by selling new CP and hence it is continuous source of funds.
- (iii) Maturing of CP can be tailored to suit requirement of firm.
- (iv) It can be issued as a source of fund, even when market is tight.
- (v) Cost of CP to the issuing firm is lower than bank loans.

(d) **Gross Profit Margin and its Importance**

This ratio tells us about the business's ability consistently to control its production costs or to manage the margins it makes on products it buys and sells. Whilst sales value and volumes may move up and down significantly, the gross profit margin is usually quite stable (in percentage terms). However, a small increase (or decrease) in profit margin, however caused can produce a substantial change in overall profits.

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

(e) Computation of Future Value

PV = ₹ 1,000 i = 12%/4 = 3% per quarter n = 8 x 4 = 32 quarters

$$\begin{aligned} \text{FV} &= \text{PV} (1 + i)^n \\ &= 1,000(1.03)^{32} \\ &= 2,575.10 \end{aligned}$$

The Amount after 8 years = ₹ 2,575

2. Balance Sheets for Sunshine Company for each Alternative Policy

	<i>Restricted</i> (40%) ₹	<i>Moderate</i> (50%) ₹	<i>Relaxed</i> (60%) ₹
Current assets	12,00,000	15,00,000	18,00,000
Fixed assets	<u>6,00,000</u>	<u>6,00,000</u>	<u>6,00,000</u>
Total assets	<u>18,00,000</u>	<u>21,00,000</u>	<u>24,00,000</u>
Debt	9,00,000	10,50,000	12,00,000
Equity	<u>9,00,000</u>	<u>10,50,000</u>	<u>12,00,000</u>
Total liabilities and equity	<u>18,00,000</u>	<u>21,00,000</u>	<u>24,00,000</u>

Profit & Loss Accounts for Sunshine Company for each Alternative Policy

	<i>Restricted</i> (40%) ₹	<i>Moderate</i> (50%) ₹	<i>Relaxed</i> (60%) ₹
Sales	30,00,000	30,00,000	30,00,000
EBIT	4,50,000	4,50,000	4,50,000
Interest (10%)	<u>90,000</u>	<u>1,05,000</u>	<u>1,20,000</u>
Earnings before taxes	3,60,000	3,45,000	3,30,000
Taxes (40%)	<u>1,44,000</u>	<u>1,38,000</u>	<u>1,32,000</u>
Net income	<u>2,16,000</u>	<u>2,07,000</u>	<u>1,98,000</u>
ROE	<u>24.0%</u>	<u>19.7%</u>	<u>16.5%</u>

3. (i) Computation of Net Present Value of the Project

	₹
Selling price per unit	10
Less: Variable Cost per unit	<u>6</u>
Contribution per unit	<u>4</u>
Total Annual Contribution (40,000 units × 4)	1,60,000
Less: Fixed cost	<u>20,000</u>
Net Annual Cash Inflow	1,40,000
Annuity factor of ₹ 1 for 6 years	3.7845
\ Total present value of net cash inflow	5,29,830
Add: Present value of scrap (₹ 20,000 × 0.4323)	<u>8,646</u>
Present value of total cash inflow	5,38,476
Less: Initial Investment	<u>4,00,000</u>
Net Present Value	<u>1,38,476</u>

(ii) Calculation of Minimum Volume of Sales Required to Justify the Project

Let the number of units to be sold be "x"

At this level, NPV should be zero.

$$\backslash (4x - 20,000) \times 3.7845 + 8,646 - \text{Rs. } 4,00,000 = 0$$

$$\backslash 15.138x - 75,690 + 8,646 - 4,00,000 = 0$$

$$\backslash 15.138x = 4,67,044$$

$$\backslash x = 30,853 \text{ units}$$

Minimum Volume of Sales Required to Justify the Project = 30,853 units

4. Evaluation of Different Alternatives and Advice to the Company

Market price per day	₹ 49
Price Earnings Ratio	7
Earnings Per Share (MPS/ Price Earnings Ratio)	$\frac{49}{7} = ₹ 7$
Total Earnings after tax	= Number of equity shares × EPS 15,00,000 × 7 = Rs.1,05,00,000

Earnings before tax	$\frac{\text{EAT}}{1 - t}$
	$= \frac{1,05,00,000}{(1 - 0.30)}$
Earnings before tax	$= ₹ 1,50,00,000$
EBIT	$\text{EBT} + \text{Interest on Debentures}$
	$= ₹ 1,50,00,000 + ₹ 10,00,000$
Earnings before Interest & Tax	$= ₹ 1,60,00,000$

Evaluation of Different Alternatives

	Equity Shares	12% Debentures & Equity shares	9% of Preference Shares & Equity Shares
	I	II	III
EBIT (Present plus 25% increase)	2,00,00,000	2,00,00,000	2,00,00,000
Less: Interest on Debentures	10,00,000	16,00,000	10,00,000
Earnings before tax	1,90,00,000	1,84,00,000	1,90,00,000
Tax	57,00,000	55,20,000	57,00,000
Earnings after tax	1,33,00,000	1,28,80,000	1,33,00,000
Less: Preference Dividend			5,40,000
Earnings available to equity shareholders	1,33,00,000	1,28,80,000	1,27,60,000
Number of Equity Shares	17,00,000	16,00,000	15,80,000
Earnings per share	7.82	8.05	8.08
Price Earnings Ratio	7.5	7	7.25
Market Price Per Share	58.65	56.35	58.58

Advise: Alpha Limited should choose Alternative-I i.e., Issue of Equity shares because market price per share of this Alternative is highest.

5. Calculation of Weighted Average Cost of Capital (WACC)

Equity : 60% of ₹ 20,00,000	=	₹ 12,00,000
Debt : 40% of ₹ 20,00,000	=	₹ <u>8,00,000</u>
Total Capital	=	₹ <u>20,00,000</u>

(i) Determination of Post-tax Average Cost of Debt

Debt at interest 10% p.a. = ₹ 4,80,000

and debt at interest 16% p.a. = 8,00,000 – 4,80,000 = ₹ 3,20,000

Cost of Debt (kd) = $I(1-T)$

on ₹ 4,80,000, kd = 10% (1- 0.5) = 5% or 0.05

on ₹ 3,20,000, kd = 16% (1- 0.5) = 8% or 0.08

$$\begin{aligned} \backslash \text{ Average Cost of Debt} &= \frac{4,80,000 \times .05 + 3,20,000 \times .08}{8,00,000} \times 100 \\ &= 6.2\% \end{aligned}$$

(ii) Determination of Cost of Equity

$$K_e = \frac{D_1}{P_0} + g$$

D_0 = Dividend payout = 50% of ₹ 6 = ₹ 3

G = Growth rate = 10%

P_0 = Current market price per share = ₹ 66

$$\begin{aligned} K_e &= \frac{₹ 3(1.1)}{66} + 10\% \\ &= 5\% + 10\% = 15\% \end{aligned}$$

(iii) Calculation of Overall Weighted Cost of Capital

	₹	Weights	Cost of Capital
Equity	12,00,000	0.60	15%
Debt	8,00,000	0.40	6.2%

$$\begin{aligned} \backslash \text{ WACC} &= 15\% \times 0.60 + 6.2\% \times 0.40 \\ &= 9\% + 2.48\% \end{aligned}$$

$$\text{WACC} = 11.48\%$$

6.

Beta Limited**Cash Flow Statement**

<i>Cash flows from operating activities</i>		<i>(₹ in lakhs)</i>
Net profit		60,000
Less: Exchange gain		(8,000)
Less: Profit on sale of investments		<u>(12,000)</u>
		40,000
Add: Depreciation on assets		<u>11,000</u>
Change in current assets and current liabilities		51,000
(-) Increase in debtors	(8,000)	
(+) Decrease in stock	12,000	
(-) Decrease in creditors	<u>(6,000)</u>	<u>(2,000)</u>
Net cash from operating activities		49,000
<i>Cash flows from investing activities</i>		
Sale of investments	70,000	
Purchase of fixed assets	<u>(65,000)</u>	
Net cash from Investing activities		5,000
<i>Cash flows from financing activities</i>		
Issue of preference shares	9,000	
Loan raised	4,500	
Redemption of Debentures	(5,700)	
Interest paid	(945)	
Dividend paid	<u>(1,400)</u>	
Net cash from financing activities		<u>5,455</u>
Net increase in cash & cash equivalents		59,455
Add: Opening cash and cash equivalents		<u>12,341</u>
<i>Closing cash and cash equivalents</i>		<u>71,796</u>

7. (i) Computation of Value of the Company by using NOI Approach

EBIT		18,00,000
Less: Interest on Debentures		<u>3,20,000</u>
Earnings available to equity shareholders		<u>14,80,000</u>
Total Cost of Capital		16%
Value of the Firm	<u>18,00,000</u>	
	0.16	
	=	1,12,50,000
Value of Debt	=	<u>32,00,000</u>
Value of Equity	=	<u>80,50,000</u>

(ii) Computation of Cost of Equity Share Capital (Ke)

$$\begin{aligned}
 K_e &= K_o \frac{V}{V+D} - K_d \frac{D}{V+D} \\
 &= 0.16 \frac{1,12,50,000}{1,12,50,000 + 32,00,000} - 0.10 \frac{32,00,000}{1,12,50,000 + 32,00,000} \\
 &= (0.16 \times 1.3975) - (0.10 \times 0.3975) \\
 &= 0.2236 - 0.03975 \\
 &= 0.18385 = 18.39\%.
 \end{aligned}$$

8. (a) Payback Period Method

The cumulative cash flows for each project are as follows:

Year	Cumulative Cash Flows	
	Project X ₹	Project Y ₹
0	(10,000)	(10,000)
1	(3,500)	(6,500)
2	(500)	(3,000)
3	2,500	500
4	3,500	4,000

$$\text{Payback}_x = 2 + \frac{\text{₹ } 500}{\text{₹ } 3,000} = 2.17 \text{ years.}$$

$$\text{Payback}_y = 2 + \frac{\text{₹ } 3,000}{\text{₹ } 3,500} = 2.86 \text{ years.}$$

Net Present Value (NPV)

$$\begin{aligned} \text{NPV}_x &= -\text{₹ } 10,000 + \frac{\text{₹ } 6,500}{(112)^1} + \frac{\text{₹ } 3,000}{(112)^2} + \frac{\text{₹ } 3,000}{(112)^3} + \frac{\text{₹ } 1,000}{(112)^4} \\ &= \text{₹ } 966.01. \end{aligned}$$

$$\begin{aligned} \text{NPV}_y &= -\text{₹ } 10,000 + \frac{\text{₹ } 3,500}{(112)^1} + \frac{\text{₹ } 3,500}{(112)^2} + \frac{\text{₹ } 3,500}{(112)^3} + \frac{\text{₹ } 3,500}{(112)^4} \\ &= \text{₹ } 630.72. \end{aligned}$$

Internal Rate of Return (IRR)

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

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

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

Modified Internal Rate of Return (MIRR)

To obtain each project's MIRR, begin by finding each project's terminal value (TV) of cash inflows:

$$\begin{aligned} \text{TV}_x &= \text{₹ } 6,500(1.12)^3 + \text{₹ } 3,000 (1.12)^2 + \text{₹ } 3,000 (1.12)^1 + \text{₹ } 1,000 \\ &= \text{₹ } 17,255.23. \end{aligned}$$

$$\begin{aligned} \text{TV}_y &= \text{₹ } 3,500(1.12)^3 + \text{₹ } 3,500 (1.12)^2 + \text{₹ } 3,500 (1.12)^1 + \text{₹ } 3,500 \\ &= \text{₹ } 16,727.65. \end{aligned}$$

Now, each project's MIRR is that discount rate that equates the present value of the terminal value to each project's cost, ₹ 10,000:

$$\text{MIRR}_x = 14.61\%.$$

$$\text{MIRR}_y = 13.73\%.$$

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

	<i>Project that ranks higher</i>
Payback	X
NPV	X

IRR	X
MIRR	X

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

- (c) If the projects are mutually exclusive, then the project with the higher NPV at $k = 12\%$, or Project X would be accepted.

9. Working Notes:

- (i) Gross Profit = ₹ 64,800
 Gross Profit Margin = 20%
 $\backslash \text{ Sales} = \frac{\text{Gross Profit}}{\text{Gross Profit Margin}} = \frac{64,800}{0.20} = ₹ 3,24,000$
- (ii) Credit Sales to Total Sales = 80%
 $\backslash \text{ Credit Sales} = 3,24,000 \times 0.80 = ₹ 2,59,200$
- (iii) Cost of Goods Sold (COGS) = Sales – Gross Profit
 $= 3,24,000 - 64,800$
 $= ₹ 2,59,200$
 Inventory turnover = 4 times of COGS
 $\backslash \text{ Inventory} = \frac{\text{COGS}}{4} = \frac{2,59,200}{4} = ₹ 64,800$
- (iv) Average collection period = 20 days
 $\backslash \text{ Debtors turnover} = \frac{360}{\text{Average collection Period i.e. 20}} = 18$
 $\backslash \text{ Debtors} = \frac{\text{Credit sales}}{18} = \frac{2,59,200}{18} = ₹ 14,400$
- (v) Long term debt to Equity = 40%
 Shareholders Fund = ₹ 7,20,000
 $\backslash \text{ Long term debt} = ₹ 7,20,000 \times 0.40 = ₹ 2,88,000$
- (vi) Total Assets Turnover = 0.3 times
 $\backslash \text{ Total Assets} = \frac{\text{Sales}}{0.3} = \frac{3,24,000}{0.3} = ₹ 10,80,000$

(vii) Total Assets = Total Liabilities = Shareholder Funds + Long-term Debt + Creditors

$$\backslash \text{ Creditors} = 10,80,000 - 7,20,000 - 2,88,000 = ₹ 72,000$$

(viii) Current Ratio = $\frac{\text{Debtors} + \text{Inventory} + \text{Cash}}{\text{Creditors}}$

$$\backslash 1.8 = \frac{14,400 + 64,800 + \text{Cash}}{72,000}$$

$$\backslash \text{Cash} = 1.8 \times 72,000 - 14,400 - 64,800 \\ = ₹ 50,400$$

Balance Sheet of Megatech Limited

Liabilities	Rs.	Assets	Rs.
Creditors	72,000	Cash	50,400
Long-term debt	2,88,000	Debtors	14,400
Shareholders fund	7,20,000	Inventory	64,800
		Fixed assets (Balancing Figure)	<u>9,50,400</u>
	<u>10,80,000</u>		<u>10,80,000</u>

10. Computation of Revised Maturity Value

$$A = P(1+i)^n$$

Where,

$$\text{Amount (A)} = ₹ 25,250$$

$$\text{Principal (P)} = ₹ 20,000$$

i = rate of interest half yearly

n = 2 years on half yearly basis i.e., $2 \times 2 = 4$

$$\backslash 25,250 = 20,000 (1+i)^4$$

$$\backslash (1+i)^4 = 1.2625$$

$$\backslash 1+i = 1.06$$

$$\backslash i = 0.06 \text{ i.e., } 6\% \text{ rate half yearly and } 12\% \text{ rate yearly.}$$

$$\begin{aligned}
 \text{If compounded quarterly, revised maturity value} &= 20,000 \left(1 + \frac{12}{100} \times \frac{1}{4} \right)^4 \\
 &= 20,000 (1.03)^8 \\
 &= 20,000 \times 1.267 = ₹ 25,340
 \end{aligned}$$

11. Estimation of Working Capital Requirement based on Cash Cost basis

Working Notes:

		₹
(i)	Calculation of Total Manufacturing Expenses	
	Sales	90,00,000
	Less: Gross Profit 25%	<u>22,50,000</u>
	Total manufacturing cost	67,50,000
	Less: Materials 22,50,000	
	Wages <u>18,00,000</u>	<u>40,50,000</u>
	Total manufacturing expenses	27,00,000
(ii)	Calculation of Depreciation	
	Total manufacturing expenses	27,00,000
	Less: Cash manufacturing expenses (₹ 2,00,000 × 12)	<u>24,00,000</u>
	Depreciation	<u>3,00,000</u>
(iii)	Calculation of Total Cash Cost	
	Total manufacturing cost	67,50,000
	Less: Depreciation	<u>3,00,000</u>
		64,50,000
	Add: Adm. expenses	6,00,000
	Add: Sales promotion expenses	<u>12,00,000</u>
	Total Cash Cost	<u>82,50,000</u>

Estimation of Current Assets	
Debtors (3 months of total cash cost) = $82,50,000 \times \frac{3}{12}$	20,62,500
Raw material stock (1 month of material cost) = $22,50,000 \times \frac{1}{12}$	1,87,500
Finished goods stock (2 months of cash cost) = $82,50,000 \times \frac{2}{12}$	13,75,000
Pre-paid sales promotion expenses $12,00,000 \times \frac{1}{4}$	3,00,000
Cash Balance	<u>2,50,000</u>
Total Current Assets =	<u>41,75,000</u>
Estimation of Current Liabilities	
Sundry Creditors (1.5 months material cost) = $22,50,000 \times \frac{1.5}{12}$	2,81,250
Manufacturing expenses outstanding	2,00,000
Wages outstanding = $18,00,000 \times \frac{1}{12}$	1,50,000
Adm. Expenses outstanding = $6,00,000 \times \frac{1}{12}$	<u>50,000</u>
Total Current Liabilities	<u>6,81,250</u>
Working Capital = CA – CL	34,93,750

- 12. (a) Investment, Financing and Dividend Decisions:** The finance functions are divided into three major decisions, viz., investment, financing and dividend decisions. These decisions are inter-related because the underlying objective of these three decisions is the same, i.e. maximisation of shareholders' wealth. The decision to invest in a new project needs 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.

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 has 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.

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.

(b) Funds Flow Statement vs. Cash Flow Statement

Cash Flow Statement	Funds Flow Statement
(i) It ascertains the changes in balance of cash- in-hand and bank	(i) It ascertains the changes in financial position between two accounting periods.
(ii) It analyses the reasons for changes in balance of cash-in-hand and at bank.	(ii) It analyses the reasons for change in financial position between two balance sheets.
(iii) It shows the inflows and outflows of cash.	(iii) It reveals the sources and application of funds.
(iv) It is an important tool for short-term analysis.	(iv) It helps to test whether working capital has been effectively used or not.

(c) Leverage Ratios and Coverage Ratios: The capital structure/leverage ratios may be defined as those financial ratios which measure the long term stability and structure of the firm. These ratios indicate the mix of funds provided by owners and lenders and assure the lenders of the long term funds with regard to:

- (i) Periodic payment of interest during the period of the loan; and
- (ii) Repayment of principal amount on maturity.

Whereas on the other hand, Coverage ratios, measure the firm's ability to service the fixed liabilities. These ratios establish the relationship between fixed claims and what is normally available out of which these claims are to be paid. The fixed claims consist of:

- (i) Interest on loans;
- (ii) Preference dividend; and
- (iii) Amortisation of principal or repayment of the instalment of loans or redemption of preference capital on maturity.

13. (a) Growth of Venture Capital Financing in India: In India, Venture Capital financing was first the responsibility of developmental financial institutions such as the Industrial Development Bank of India (IDBI), the Technical Development and Information Corporation of India (now known as ICICI) and the State Finance Corporations (SFCs). In the year 1988, the Government of India took a policy initiative and announced guidelines for Venture Capital Funds (VCFs). In the same year, a Technology Development Fund (TDF) financed by the levy on all payments for technology imports was established. This fund was meant to facilitate the financing of innovative and high risk technology programmes through the IDBI.

A major development in venture capital financing in India was in the year 1996 when the Securities and Exchange Board of India (SEBI) issued guidelines for venture capital funds to follow. These guidelines described a venture capital fund as a fund established in the form of a company or trust, which raises money through loans, donations, issue of securities or units and makes or proposes to make investments in accordance with the regulations. This move was instrumental in the entry of various foreign venture capital funds to enter India. The guidelines were further amended in April 2000 with the objective of fuelling the growth of Venture Capital activities in India. A few venture capital companies operate as both investment and fund management companies; others set up funds and function as asset management companies.

It is hoped that the changes in the guidelines for the implementation of venture capital schemes in the country would encourage more funds to be set up to give the required momentum for venture capital investment in India.

(b) External Commercial Borrowings (ECBs) : ECBs refer to commercial loans (in the form of bank loans, buyers credit, suppliers credit, securitised instruments (e.g. floating rate notes and fixed rate bonds) availed from non-resident lenders with minimum average maturity of 3 years. Borrowers can raise ECBs through internationally recognised sources like (i) international banks, (ii) international capital markets, (iii) multilateral financial institutions such as the IFC, ADB, etc, (iv) export credit agencies, (v) suppliers of equipment, (vi) foreign collaborators and (vii) foreign equity holders.

External Commercial Borrowings can be accessed under two routes viz (i) Automatic route and (ii) Approval route. Under the Automatic route there is no need to take the RBI/Government approval whereas such approval is necessary under the Approval route. Company's registered under the Companies Act and NGOs

engaged in micro-finance activities are eligible for the Automatic Route whereas Financial Institutions and Banks dealing exclusively in infrastructure or export finance and the ones which had participated in the textile and steel sector restructuring packages as approved by the government are required to take the Approval Route.

(c) **Forms of Bank Credit:** The bank credit will generally be in the following forms:

- Ø **Cash Credit:** This facility will be given by the banker to the customers by giving certain amount of credit facility on continuous basis. The borrower will not be allowed to exceed the limits sanctioned by the bank.
- Ø **Bank Overdraft:** It is a short-term borrowing facility made available to the companies in case of urgent need of funds. The banks will impose limits on the amount they can lend. When the borrowed funds are no longer required they can quickly and easily be repaid. The banks issue overdrafts with a right to call them in at short notice.
- Ø **Bills Discounting:** The company which sells goods on credit, will normally draw a bill on the buyer who will accept it and sends it to the seller of goods. The seller, in turn discounts the bill with his banker. The banker will generally earmark the discounting bill limit.
- Ø **Bills Acceptance:** To obtain finance under this type of arrangement a company draws a bill of exchange on bank. The bank accepts the bill thereby promising to pay out the amount of the bill at some specified future date.
- Ø **Line of Credit:** Line of Credit is a commitment by a bank to lend a certain amount of funds on demand specifying the maximum amount.
- Ø **Letter of Credit:** It is an arrangement by which the issuing bank on the instructions of a customer or on its own behalf undertakes to pay or accept or negotiate or authorizes another bank to do so against stipulated documents subject to compliance with specified terms and conditions.
- Ø **Bank Guarantees:** Bank guarantee is one of the facilities that the commercial banks extend on behalf of their clients in favour of third parties who will be the beneficiaries of the guarantees.