

PAPER – 3 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I : COST ACCOUNTING

QUESTIONS

Material

1. M/s Fujitech Ltd. is the manufacturer of monitors for PCs. The following are the details of its operation during 2011:

Ordering cost	₹ 1,000 per order
Inventory carrying cost	20% per annum
Cost of monitors	₹ 3,500 per monitor
Normal usage	425 monitors per week
Minimum usage	49 monitors per week
Maximum usage	710 monitors per week
Lead time to supply	3-5 weeks

Compute from the above:

- (1) Economic Order Quantity. If the supplier is willing to supply quarterly 5500 units at a discount of 5%, is it worth accepting?
- (2) Reorder level
- (3) Maximum level of stock
- (4) 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.

Find out 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 Gopal Ltd. having fifteen different types of automatic machines furnishes information as under for 2011-2012

- (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.

Find out 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 Accounts

4. MML Ltd. operates on historic job cost accounting system, which is not integrated with financial accounts. At the beginning of a month, the opening balances in cost ledger were.

	₹ (in lakhs)
Stores Ledger Control Account	120
Work-in-Progress Control Account	35
Finished Goods Control Account	465
Building Construction Account	22
Cost Ledger Control Account	642

During the month, the following transactions took place:

Material	Purchased	90
	Issued to production	130
	Issued to general maintenance	8
	Issued to building construction	4

Wages	Gross wages paid:	190
	- Indirect wages	75
	- For building construction	13
Works Overheads	Actual amount incurred (excluding items shown above)	215
	Absorbed in building construction	20
	Under absorbed	8
Royalty paid		5
Selling, distribution and administration overheads		25
Sales		570

At the end of the month, the stock of raw material and work-in-progress was ₹ 60 lakhs ₹ 37 lakhs respectively. The loss arising in the raw material account is treated as factory overhead. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

Prepare the relevant control accounts to record the above transactions in the cost ledger of company.

Method of Costing (I)

5. S Travels has been promised a contract to run a tourist car on a 20 km. long route for a multinational firm. He buys a car costing ₹ 4,50,000. The annual cost of insurance and taxes are ₹ 7,500 and ₹ 1800 respectively. He has to pay ₹ 2500 per month for a garage where he keeps the car when it is not in use. The annual repair costs are estimated at ₹ 12,000. The car is estimated to have a life of 10 years at the end of which the scrap value is likely to be ₹ 50,000.

He hires a driver who is to be paid ₹ 3,000 per month plus 10% of the takings as commission. Other incidental expenses are estimated at ₹ 2,000 per month.

Petrol and oil will cost ₹ 220 per 100 kms. The car will make 4 round trips each day. Assuming that a profit of 15% on takings is desired and that the car will be on the road for 25 days on an average per month, what should he charge per round-trip?

Method of Costing (II)

6. A product passes through three processes – A, B and C. The details of expenses incurred on the three processes during the year 2011 were as under:

Process	A	B	C
Units issued / introduced cost per unit ₹ 100	10,000		

	₹	₹	₹
Sundry Materials	10,000	15,000	5,000
Labour	30,000	80,000	65,000
Direct Expenses	6,000	18,150	27,200
Selling price per unit of output	120	165	250

Management expenses during the year were ₹ 80,000 and selling expenses were ₹ 50,000 these are not allocable to the processes.

Actual output of the three processes was:

A – 9,300 units, B-5,400 units and C-2,100 units. Two third of the output of Process A and one half of the output of Process B was passed on to the next process and the balance was sold. The entire output of process C was sold.

The normal loss of the three processes, calculated on the input of every process was:

Process A-5%; B-15% and C-20%

The Loss of Process A was sold at ₹ 2 per unit, that of B at ₹ 5 per unit and of Process C at ₹ 10 per unit.

Prepare the Three Process Accounts and the Profit and Loss Account.

Standard Costing

7. Nandana 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 @ ₹1.50	1.50
Total	54.50

During Jan. 2012, 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.

Calculate:

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

Also reconcile the standard and actual cost of production.

Marginal Costing

8. 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.

Budgets and Budgetary Control

9. The expenses budgeted for production of 15,000 units in a factory are furnished below :

	₹ Per unit
Material	50
Labour	21
Variable overheads	18
Fixed overheads (₹1,50,000)	10
Variable expenses (direct)	6
Selling expenses (20% fixed)	15
Distribution expenses (10% fixed)	7
Administration expenses (₹ 75,000)	5
Total	<u>132</u>

Prepare a budget for the production of (a) 10,000 units, and (b) 8,000 units.

Assume that administration expenses are rigid for all levels of production.

Misc.

10. (i) Discuss the implications of cost-plus contracts from the view points of:
 (a) the manufacturer
 (b) the customer.
- (ii) What is the relevance of escalation clause provided in the contracts?
- (iii) Outline the steps involved in installing a costing system in a manufacturing unit.

SUGGESTED ANSWERS/HINTS**Cost Accounting**

1. (1) S = Annual usage of monitors = Normal usage per week × 52 weeks

$$= 425 \text{ tubes} \times 52 \text{ weeks} = 22,100 \text{ monitors}$$

$$C_0 = \text{Ordering cost per order} = ₹ 1000/- \text{ per order}$$

$$C_1 = \text{Cost per monitor} = ₹ 3500/-$$

$$iC_1 = \text{Inventory carrying cost per unit per annum}$$

$$= 20\% \times ₹ 3500 = ₹ 700/- \text{ per unit, per annum}$$

Economic order quantity:

$$E.O.Q = \sqrt{\frac{2SC_0}{iC_1}} = \sqrt{\frac{2 \times 22,100 \text{ units} \times ₹ 1000}{₹ 700}} = 251 \text{ monitors (approx.)}$$

The supplier is willing to supply 5500 units at a discount of 5%, therefore cost of each monitor shall be ₹ 3500 – 5% of 3500 = ₹ 3325

Total cost (when order size is 5500 units) = Cost of 22,100 units + Ordering cost + Carrying cost.

$$= (22,100 \text{ units} \times ₹ 3325) + \frac{22,100 \text{ units}}{5,500 \text{ units}} \times ₹ 1000 + \frac{1}{2} (5,500 \text{ units} \times 20\% \times ₹ 3325)$$

$$= ₹ 7,34,82,500 + ₹ 4018.18 + ₹ 18,28,750 = ₹ 7,53,15,268.18$$

Total cost (when order size is 251 units)

$$= (22,100 \text{ units} \times ₹ 3500) + \frac{22,100 \text{ units}}{251 \text{ units}} \times ₹ 1000 + \frac{1}{2} (251 \text{ units} \times 20\% \times ₹ 3500)$$

$$= ₹ 7,73,50,00 + ₹ 88,047.81 + ₹ 87,850 = ₹ 7,75,25,897.81$$

Since, the total cost under quarterly supply of 5,500 unit with 5% discount is lower than that when order size is 251 units, therefore the offer should be accepted.

Note: While accepting this offer consideration of capital blocked on order size of 5,500 units per quarter has been ignored.

(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 + 251 units – (49 units × 3 weeks) = 3,654 units.

(4) Minimum level of stock

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

= 3,550 units – (425 units × 4 weeks) = 1850 units.

2. Calculation of :

1. Time saved and wages:

Workmen	A	B
Standard time (hrs.)	40	40
Actual time taken (hrs.)	<u>32</u>	<u>30</u>
Time saved (hrs.)	<u>08</u>	<u>10</u>
Wages paid @ ₹ x per hr. (₹)	32x	30x

2. Bonus Plan:

	Halsey	Rowan
Time saved (hrs.)	8	10
Bonus (₹)	4x	7.5x
	$\frac{8 \text{ hrs} \times ₹ x}{40 \text{ hrs}} = \frac{8x}{40}$	$\frac{10 \text{ hrs} \times ₹ x}{30 \text{ hrs}} = \frac{10x}{30}$

3. Total wages:

Workman A: 32x + 4x = ₹ 36x

Workman B: 30x + 7.5x = ₹ 37.5x

Statement of factory cost of the job

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

The above relations can be written as follows:

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

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

Subtracting (i) from (ii) we get

$$1.5x - 15 = 0$$

$$\text{or } 1.5x = 15$$

$$\text{or } x = ₹ 10 \text{ per hour}$$

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 Gopal 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	<u>12,000</u>
	<u>52,000</u>
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	<u>25.00</u>	<u>12.50</u>
Comprehensive machine hour rate per hr.	<u>38.00</u>	<u>30.50</u>

**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	1140
Operation time cost	100	30.5	<u>3050</u>	190	30.5	<u>5,795</u>
Total cost			<u>3,620</u>			<u>6,935</u>

4. Cost Ledger Control A/c

(₹ In lakhs)

Dr.			Cr.
	₹		₹
To Costing P & L A/c (Sales)	570	By Balance b/d	642
To Stores Ledger Control A/c	60	By Stores Ledger Control A/c	90
To WIP Control A/c	37	By Wages Control A/c	190
To Building A/c	59	By Works Overhead Control A/c	215
To Finished Goods Control A/c	522	By Royalty A/c	5
		By Selling Distribution and Administration Overheads A/c	25
		By Costing Profit & Loss A/c	<u>81</u>
	<u>1248</u>		<u>1248</u>

Stores Ledger Control A/c

Dr.			Cr.
	₹		₹
To Balance b/d	120	By WIP Control A/c	130
To Cost Ledger Control A/c	90	By Works Overhead Control A/c	8
		By Building Const. A/c	4
		By Closing Balance	60
		By Work Overhead Control A/c (Loss)	<u>8</u>
	<u>210</u>		<u>210</u>

Work-in-Progress Control A/c

Dr.			Cr.
	₹		₹
To Balance b/d	35	By Finished Goods Control A/c	513
To Stores Ledger Control A/c	130	By Closing Balance	37
To Wage Control A/c	102		
To Works Overhead Control A/c	278		
To Royalty A/c	<u>5</u>		
	<u>550</u>		<u>550</u>

Finished Goods Control A/c

Dr.			Cr.
	₹		₹
To Balance b/d	465	By Cost of Goods Sold A/c (Refer Working Note)	456
To WIP Control A/c	<u>513</u>	By Balance c/d	<u>522</u>
	<u>978</u>		<u>978</u>

Cost of Sales A/c

Dr.			Cr.
	₹		₹
To Cost of Goods Sold A/c	456	By Costing P & L A/c	481
To Selling, Distribution and Administration Overheads A/c	<u>25</u>		
	<u>481</u>		<u>481</u>

Costing P & L A/c

Dr.			Cr.
	₹		₹
To Cost of Sales A/c	481	By Cost Ledger Control A/c (sales)	570
To Works Overhead Control A/c	8		
To Cost Ledger Control A/c (Profit)	<u>81</u>		
	<u>570</u>		<u>570</u>

Building Construction A/c

Dr.			Cr.
	₹		
To Balance b/d	22	By Building A/c	59
To Stores Ledger Control A/c	4	(construction completed and transferred to Building A/c)	
To Wage Control A/c	13		
To Works Overhead Control A/c	<u>20</u>		
	<u>59</u>		<u>59</u>

Building A/c

Dr.			Cr.
	₹		₹
To Building Construction A/c	<u>59</u>	By Balance C/d	<u>59</u>
	<u>59</u>		<u>59</u>

Works Overhead Control A/c

Dr.			Cr.
	₹		₹
To Stores Ledger Control A/c	8	By Building Construction A/c	20
To Wage Control A/c	75	By WIP Control A/c	278
To Cost Ledger Control A/c	215	By Balance (Costing P & L A/c)	8
To Stores Ledger Control A/c (Loss)	<u>8</u>		
	<u>306</u>		<u>306</u>

Wages Control A/c

Dr.			Cr.
	₹		₹
To Cost Ledger Control A/c	190	By Works Overhead Control A/c	75
		By Building Const. A/c	13
	—	By WIP Control A/c	<u>102</u>
	<u>190</u>		<u>190</u>

Royalty A/c

Dr.			Cr.
	₹		₹
To Cost Ledger Control A/c	<u>5</u>	By WIP Control A/c	<u>5</u>
	<u>5</u>		<u>5</u>

Cost of Goods Sold A/c

Dr.			Cr.
	₹		₹
To Finished Goods Control A/c	<u>456</u>	By Cost of Sales A/c	<u>456</u>
	<u>456</u>		<u>456</u>

Selling, Distribution and Administration Overheads A/c

Dr.			Cr.
	₹		₹
To Cost Ledger Control A/c	<u>25</u>	By Cost of Sales A/c	<u>25</u>
	<u>25</u>		<u>25</u>

Trial Balance

		₹ In (laks)
	Dr.	Cr.
To Stores Ledger Control A/c	60	
To WIP Control A/c	37	
To Finished Goods Control A/c	522	
To Cost Ledger Adjustment A/c	—	<u>619</u>
	<u>619</u>	<u>619</u>

Working Note

If S.P. is ₹ 100 then C.P. = ₹ 80

If S.P. is ₹ 570 then C.P. = ₹ $\frac{80}{100} \times ₹ 570 = 456$ lakhs.

5. Statement of Operating cost.

<i>Standing charges</i>	<i>Per Annum</i>	<i>Per Month</i>
	₹	₹
Depreciation [(4,50,000- 50,000)/10]	40,000	
Insurance	7,500	
Taxes	1,800	
Garage (₹ 2500 × 12)	30,000	
Annual repairs	12,000	
Driver's Salary (₹ 3,000 × 12)	36,000	
Incidental expenses (₹ 2000 × 12)	24,000	
	1,51,300	12608.33

Variable expenses

Petrol and Oil : 8,800.00

$\frac{₹ 4,000 \times \text{kms} \times \frac{1}{100} \text{ kms.} \times ₹ 220}{100}$

Total Cost (without commission) 21,408.33

Let X be the total takings per month

Driver's Commission = 10% of X = $\frac{X}{10}$

Profit = 15% of X = $\frac{15}{100} \times X = \frac{3X}{20}$

Total takings per month = Total cost + Driver's Commission + Profit

or $X = ₹ 21,408.33 + \frac{X}{10} + \frac{3X}{20}$

or $X - \frac{3X}{20} - \frac{X}{10} = ₹ 21,408.33$

or $\frac{20X - 3X - 2X}{20} = ₹ 21,408.33$

$$\text{or } \frac{15X}{20} = ₹ 21,408.33$$

$$\text{or } X = \frac{₹ 21,408.33 \times 4}{3}$$

$$X = ₹ 28,544.44$$

Total number of round trips per month : 25 days × 4 round trips per day = 100

$$\begin{aligned} \text{Hence the charge per round trip} &= \frac{₹ 28,544.44}{100} \\ &= ₹ 285.44 \end{aligned}$$

* 20 kms. × 2 × 4 × round trips × 25 days = 4,000 kms.

6. Process A Account

Dr.					Cr.
Particulars	Units	₹	Particulars	Units	₹
To Units brought in (₹100×10,000)	10,000	10,00,000	By Normal Loss (5% of 10,000 units @ ₹2/- p.u.)	500	1,000
To Sundry Materials		10,000	By Abnormal loss (Working note 1)	200	22,000
To Labour		30,000	Process B A/c (Output to be transferred ₹ 110 × 6,200) (W. Note 1)	6,200	6,82,000
To Direct expenses		6,000	By Profit & Loss A/c (₹ 110 × 3,100 units) (W. Note 1)	3,100	3,41,000
	<u>10,000</u>	<u>10,46,000</u>		<u>10,000</u>	<u>10,46,000</u>

Process B Account

Dr.					Cr.
Particulars	Units	₹	Particulars	Units	₹
To Process A A/c	6,200	6,82,000	By Normal Loss (15% of 6,200 Units = 930 units @ ₹5/- p.u.)	930	4,650
To Sundry Materials		15,000			
To Labour		80,000			

To Direct expenses		18,150			
To Abnormal gain (Working Note 2)	130	19,500	By Process C A/c (Output to be transferred) ₹ 150 × 2,700 (Working Note 2)	2,700	4,05,000
			By Profit & Loss A/c (₹ 150 × 2,700)	2,700	4,05,000
	<u>6,330</u>	<u>8,14,650</u>		<u>6,330</u>	<u>8,14,650</u>

Process C Account

Dr.					Cr.
Particulars	Units	₹	Particulars	Units	₹
To Process B A/c	2,700	4,05,000	By Normal Loss (20% of 2,700 units = 540 units @ ₹ 10/- p.u.)	540	5,400
To Sundry Materials		5,000			
To Labour		65,000	By Abnormal Loss (Working Note 3)	60	13,800
To Direct expenses		27,200	By Profit & Loss A/c (₹ 230 × 2,100 units) (Working Note 3)	2,100	4,83,000
	<u>2,700</u>	<u>5,02,200</u>		<u>2,700</u>	<u>5,02,200</u>

Profit & Loss Account

Dr.					Cr.
Particulars	Units	₹	Particulars	Units	₹
To Process A A/c	3,100	3,41,000	By Sale (Process A's Output @ ₹ 120/- p.m.)	3,100	3,72,000
To Process B A/c	2,700	4,05,000			
To Process C A/c	2,100	4,83,000	By Sale (Process B's Output @ ₹ 165/- p.u.)	2,700	4,45,500
To Management Expenses		80,000			
To Selling Expenses		50,000			

To Abnormal Loss A/c (Working Note 4)		34,800	By Sale (Process C's Output @ ₹ 250/- p.u.)	2,100	5,25,000
			By Abnormal gain A/c (Working Note 5)		18,850
			By Net Loss		<u>32,450</u>
	<u>7,900</u>	<u>13,93,800</u>		<u>7,900</u>	<u>13,93,800</u>

Working Notes

1. (i) Per unit cost of normal production under process A:

$$= \frac{\text{Normal cost of normal output}}{\text{Normal production output}}$$

$$= \frac{\text{₹ } 10,46,000 - \text{₹ } 1,000}{9,500 \text{ units}} = \text{₹ } 110$$

- (ii) Value of Abnormal loss under process A:

$$\begin{aligned} \text{Abnormal loss units} &= \text{Normal production} - \text{Actual production} \\ &= 9,500 - 9,300 = 200 \text{ units} \\ \text{Value of Abnormal Loss} \\ &= \text{Per unit cost of normal production} \times \text{Abnormal loss units} \\ &= \text{₹ } 110 \times 200 = \text{₹ } 22,000. \end{aligned}$$

2. (i) Per unit cost of normal production under process B:

$$= \frac{(\text{₹ } 7,95,150 - \text{₹ } 4,659)}{5,270} = \frac{\text{₹ } 7,90,500}{5,270} = \text{₹ } 150$$

- (ii) Value of Abnormal gain under process B:

$$\begin{aligned} \text{Abnormal gain units} &= \text{Normal loss} - \text{Actual loss} \\ &= 930 - 800 = 130 \text{ units} \\ &= \text{Per unit cost of normal production} \times \text{Abnormal gain units} \\ &= \text{₹ } 150 \times 130 \text{ units} = \text{₹ } 19,500. \end{aligned}$$

3. (i) Per unit cost of normal production under process C:

$$= \frac{(\text{₹ } 5,02,200 - \text{₹ } 5,400)}{2,160 \text{ units}} = \frac{\text{₹ } 4,96,800}{2,160 \text{ units}} = \text{₹ } 230$$

(ii) Value of Abnormal loss under process C:

Abnormal loss units

= Normal production – Actual production

= 2,160 units – 2,100 units = 60 units

= ₹ 230 × 60 units = ₹ 13,800

4. **Abnormal Loss Account**

Dr.					Cr.		
	Units	Cost p.u. ₹	Amount ₹	Particulars	Units	Cost p.u. ₹	Amount ₹
To Process A A/c	200	110	22,000	By Sale proceeds of Process A	200	2	400
To Process C A/c	60	230	13,800	By Sale proceeds of Process C loss	60	10	600
				By Profit & Loss A/c			<u>34,800</u>
	<u>260</u>	<u>35,800</u>			<u>260</u>		<u>35,800</u>

5. **Abnormal Gain Account**

Dr.					Cr.		
	Units	Cost p.u. ₹	Amount ₹	Particulars	Units	Cost p.u. ₹	Amount ₹
To Normal loss shortfall	130	5	650	By Process B	130	150	19,500
To Profit & Loss A/c			<u>18,850</u>				
			<u>19,500</u>				<u>19,500</u>

7. (a) **Material price variance:**

= (Standard price – Actual Price) × Actual quantity

= (₹ 4 – ₹ 4.10) × 5,000 = ₹ 500 Adv.

(b) Material usage variance:

$$\begin{aligned} &= (\text{Std. quantity for actual output} - \text{Actual qty.}) \times \text{Std. price} \\ &= (600 \times 5 - 3,500) \times 4 = ₹ 2,000 \text{ Adv.} \end{aligned}$$

(c) Labour Rate Variance:

$$\begin{aligned} &= (\text{Standard rate} - \text{Actual rate}) \times \text{Actual hours} \\ &= (₹ 10 - ₹ 9) \times 1,700 = ₹ 1,700 \text{ Fav.} \end{aligned}$$

(d) Labour Efficiency Variance:

$$\begin{aligned} &= (\text{Standard hours for actual output} - \text{Actual hours}) \times \text{Standard rate} \\ &= (600 \times 3 - 1,700) \times ₹ 10 \\ &= ₹ 1,000 \text{ Fav.} \end{aligned}$$

(e) Variable Overhead Expenditure Variance

$$\begin{aligned} &= (\text{Actual Hours} \times \text{Standard Rate}) - \text{Actual Overhead} \\ &= (1700 \times ₹ 1) - ₹ 1900 \\ &= ₹ 200 \text{ Adv.} \end{aligned}$$

(f) Variable Overhead Efficiency Variance:

$$\begin{aligned} &= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Std. rate} \\ &= (600 \times 3 - 1,700) \times ₹ 1 = ₹ 100 \text{ Fav.} \end{aligned}$$

(g) Fixed Overhead Expenditure Variance:

$$\begin{aligned} &= (\text{Budgeted overhead} - \text{Actual overhead}) \\ &= (1,800 \times 0.50 - 900) = \text{Nil} \end{aligned}$$

(h) Fixed Overhead Volume Variance:

$$\begin{aligned} &= (\text{Std. hours for actual output} - \text{Budgeted hours}) \times \text{Std. rate} \\ &= (600 \times 3 - 1,800) \times ₹ 0.50 = \text{Nil} \end{aligned}$$

(i) Fixed Overhead Capacity Variance:

$$\begin{aligned} &= (\text{Budgeted hours} - \text{Actual Hours}) \times \text{Standard rate} \\ &= (1,800 - 1,700) \times ₹ 0.50 = ₹ 50 \text{ Adv.} \end{aligned}$$

(j) Fixed Overhead Efficiency Variance:

$$\begin{aligned} &= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Standard rate} \\ &= (600 \times 3 - 1,700) \times ₹ 0.50 = ₹ 50 \text{ Fav.} \end{aligned}$$

Verification:	₹	₹	
Overhead recovered: 600 units @ ₹4.50		2,700	
Actual Overhead:			
Variable	1,900		
Fixed	900	2,800	
		100 Adv.	
Variable expenditure variance		200	
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.

8. 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

$$15 \times 8,000 - 8,000x = y - 40,000 \quad (1)$$

When sales volume raised to 20,000 units, then

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

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

$$3,00,000 - 20,000x = y + 80,000 \quad (4)$$

From (3) & (4) we get $x = ₹ 5$.

Variable cost per unit = ₹ 5

Putting this value in 3rd equation:

$$1,20,000 - (8,000 \times 5) = y - 40,000$$

$$\text{or } y = ₹ 1,20,000$$

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

$$15x - 5x = 1,20,000 \quad (\text{at BEP, contribution will be equal to fixed cost})$$

$$x = 12,000 \text{ units.}$$

Or Break-even sales in units = 12,000

Break-even sales in rupees = $12,000 \times ₹ 15 = ₹ 1,80,000$.

9.

Flexible Budget for the period.....

	8,000 units		10,000 units		15,000 units	
	Per unit ₹	Total ₹	Per Unit ₹	Total ₹	Per unit ₹	Total ₹
Materials	50.00	4,00,000	50.00	5,00,000	50.00	7,50,000
Labour	21.00	1,68,000	21.00	2,10,000	21.00	3,15,000
Direct exp.(variable)	6.00	48,000	6.00	60,000	6.00	90,000
Variable overhead	18.00	1,44,000	18.00	1,80,000	18.00	2,70,000
Fixed overhead	18.75	1,50,000	15.00	1,50,000	10.00	1,50,000
Selling exp. : Fixed	5.63	45,000	4.50	45,000	3.00	45,000
Variable	12.00	96,000	12.00	1,20,000	12.00	1,80,000
Distribution exp.: Fixed	1.31	10,500	1.05	10,500	0.70	10,500
Variable	6.30	50,400	6.30	63,000	6.30	94,500
Adm. Exp.: Fixed	9.38	75,000	7.50	75,000	5.00	75,000
Total Cost	148.37	11,86,900	141.35	14,13,500	132.00	19,80,000

Working Notes :

1. Material, labour, direct expenses and variable overheads are variable costs and do not change per unit. Total amount changes in proportion to the number of units produced.
 2. Fixed overhead total amount remains at ₹1,50,000 at all levels of output. Per unit fixed overhead is ₹1,50,000 divided by the number of units produced.
 3. Adm. Expenses are also fixed. It is calculated in the same manner as fixed overhead.
 4. Selling expenses are 20% fixed when output is 15,000 units i.e., ₹ 45,000 (₹3.00 × 15,000 units). Variable selling expenses per unit are 80% of ₹ 15 i.e. ₹ 12.00. Total fixed cost of ₹ 45,000 remains the same at each level and per unit is calculated by dividing ₹ 45,000 by the number of units at each level. Variable selling expenses per unit is ₹ 12.00 which remains the same at each level. Total variable selling expenses are calculated by multiplying ₹ 12.00 by the number of units at each activity level.
 5. Distribution expenses are calculated in the same way as selling expenses.
10. (i) (a) **'Cost Plus Contract' and Manufacturer:** 'Cost Plus Contract' is a contract in which the value of the contract is ascertained by adding a fixed margin of profit to the total cost of the contract. The favourable implications of cost-plus-contracts from the view point of the manufacturer are the following:
- (1) The manufacturer is assured of a certain percentage of profit in advance.
 - (2) The manufacturer is protected against any fluctuations in the market prices of the various cost elements involved in the production.
 - (3) It is of considerable benefit when the cost estimates are not firm or reliable for some reason or the other e.g., figures for the previous years may not be available.
 - (4) The possibility of incurring any loss is completely eliminated.
- In spite of these advantages there is a fundamental drawback. If the contractor effects any economy, it will lead to a lower profit to him. Thus he cannot make profit as much as he would have from a fixed price contract.
- (b) **'Cost Plus Contract' and the Customer:** The favourable implications of 'Cost Plus Contract' from the view point of customer are given below:
- (1) The customer feels satisfied because he believes that the contract price has not been fixed up arbitrarily.
 - (2) The price paid by the customer depends upon the actual cost.

- (3) The customer is completely fortified in the situation of an uncertain market.

The main drawbacks from the customer's point of view are as follows:

- (1) The price which the customer has to pay under the contract depends upon the cost of the contract and the same cannot be ascertained until the work is complete. He may feel that the price he has to pay would not be arbitrary, yet the amount he has to pay is bound to be uncertain.
 - (2) Due to complete security about profit margin there may not be any incentive for the manufacturer to reduce costs; in fact he will tend to increase the costs.
- (ii) When a contract is likely to take long to complete or even to commence and the price is fixed, the contractor would like to protect his interest against a high rise in the prices of materials, wage rates etc. This he does through what is called an "escalation clause" which states the increase in the contract price for a given increase in the prices of inputs. For example, it may state that if the price of steel goes up by 10%, the contract price will increase by 1.5%. This implies that the base prices of inputs should be agreed upon and also that the date after which increase in prices will be taken into account will be fixed. The contractor is not compensated for price changes which could be avoided, for example, by completing the contract on time.
- It is not necessary that the contractee must agree to the escalation clause; it is a matter of negotiation between the two parties.
- (iii) The main steps involved in installing a costing system in a manufacturing unit may be outlined as below:
- (a) The objectives of installing a costing system in a manufacturing concern and the expectations of the management from such a system should be identified first. The system will be a simple one in the case of a single objective but will be an elaborate one in the case of multiple objectives.
 - (b) It is important to ascertain the significant variables of the manufacturing unit which are amenable to control and affect the concern. For example, quite often the production costs control may be more important than control of its marketing cost. Under such a situation, the costing system should devote greater attention to control production costs.
 - (c) A thorough study to know about the nature of business, its technical aspects; products, methods and stages of production should also be made. Such a study will facilitate in selecting a proper method of costing for manufacturing unit.

- (d) A study of the organisation structure, its size and layout etc., is also necessary. This is useful to management to determine the scope of responsibilities of various managers.
- (e) The costing system should be evolved in consultation with the staff and should be introduced only after meeting their objections and doubts, if any. The co-operation of staff is essential for the successful operation of the system.
- (f) Details of records to be maintained by the costing system should be carefully worked out. The degree of accuracy of the data to be supplied by the system should be determined.
- (g) The forms to be used by foreman, workers, etc., should be standardised. These forms be suitably designed and must ensure minimum clerical work at all stages.
- (h) Necessary arrangements should be made for the flow of information/data to all concerned managers, at different levels, regularly and promptly.
- (i) Reconciliation of costs and financial accounts be carried out regularly, if they are maintained separately.
- (j) The costing system to be installed should be easy to understand and simple to operate.

PART II : FINANCIAL MANAGEMENT**QUESTIONS**

1. Answer the following, supporting the same with reasoning/working notes:
 - (a) Mr. Shanker has bought a new car and has taken a 20 month car loan of ₹ 6,00,000. The rate of interest is 12 per cent per annum. You are required to compute the amount of monthly loan amortization for Mr. Shanker?
 - (b) If a company finds that its cost of capital has changed does this affect the profitability of the company?
 - (c) Do you think it is worth offering discounts to debtors to encourage prompt payment? Comment.
 - (d) Explain as to how the wealth maximisation objective is superior to the profit maximisation objective.
 - (e) Discuss the role of Chief Financial Officer (CFO) in an organisation.

Working Capital Management

2. Zeta Limited has a current sales of ₹ 7,20,000. It is considering revising its credit policy. The proposed terms of credit will be “2, 10, net 30” against the present policy of “net 30”. As a result, Zeta Limited's sales are expected to increase by ₹ 20,000 and the average collection period will reduce from 30 days to 20 days. It is also expected that 50 percent of the customers will take the discounts and pay on the 10th day and rest of the customers will pay on the 30th day. Bad debt losses will remain at 2 percent of sales. The variable cost ratio is 70 percent. Its corporate tax rate is 50 percent and opportunity cost of investment in receivables is 10 percent. Advise whether Zeta Limited should change its credit period?

Investment Decisions

3. You are the financial advisor for Gamma Limited. The management has requested 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 expected net cash flows for the two projects are as follows:

<i>Expected Net Cash Flows</i>		
<i>Year</i>	<i>Project X</i>	<i>Project Y</i>
	₹	₹
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

You are required to:

- 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?

Financing Decisions

- Mahalaxmi Engineering Limited has the following capital structure, which it considers to be optimal:

<i>Capital Structure</i>	<i>Weightage (in percentage)</i>
Debt	25
Preference Shares	15
Equity Shares	<u>60</u>
	<u>100</u>

The Company's expected net income this year is ₹ 34,285.72, its established dividend payout ratio is 30 per cent, its tax rate is 40 per cent, and investors expect earnings and dividends to grow at a constant rate of 9 per cent in the future. The Company paid a dividend of ₹ 3.60 per share last year and its shares currently sell at a price of ₹ 54 per share.

Mahalaxmi Limited requires additional funds which it can obtain in the following ways:

- Preference Shares:* New preference shares with a dividend of ₹ 11 can be sold to the public at a price of ₹ 95 per share.
- Debt:* Debt can be sold at an interest rate of 12 per cent.

You are required to:

- Determine the cost of each capital structure component; and
- Compute the weighted average cost of capital (WACC) of Mahalaxmi Engineering Limited.

Financing Decisions

- You are required to compute the operating leverage for each of the four firms A, B, C and D from the following price and cost data. What inferences can you draw with respect to levels of fixed cost and the degree of operating leverage result? Assume number of units sold is 5,000.

	<i>Firms</i>			
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
	₹	₹	₹	₹
Sale Price per unit	20	32	50	70
Variable Cost per unit	6	16	20	50
Fixed Operating Cost	80,000	40,000	2,00,000	Nil

Financial Analysis and Planning

6. You are given the following information for Ganpati Forgings Limited (₹ in crores):

	₹
Cash and Marketable Securities	10.00
Fixed Assets	28.35
Sales	100.00
Net Income	5.00
Current Liabilities	10.55
Current Ratio	3.0
DSO*	40.55 days
ROE	12%

*Calculation is based on a 365 days year.

The company has no preference shares – only equity shares, current liabilities, and long-term debt.

(a) You are required to calculate Ganpati Forgings Limited's:

- (i) Accounts Receivable (A/R)
- (ii) Current Assets
- (iii) Total Assets
- (iv) ROA
- (v) Equity Shares
- (vi) Long-term Debt.

(b) In part (a), Ganpati Forgings Limited's accounts receivable (A/R) = ₹ 11.10 crores. If the company could reduce its days sales outstanding (DSO) from 40.55 days to 30.4 days while holding other things constant, how much cash would it generate? If

this cash were used to buy back equity shares (at book value), thus reducing the amount of common equity, how would this affect the:

- (i) ROE
- (ii) ROA
- (iii) Total Debt/Total Assets Ratio?

Investment Decisions

7. Dryash Limited is considering buying a new machine which would have a useful economic life of five years, a cost of ₹ 1,25,000 and a scrap value of ₹ 30,000, with 80 per cent of the cost being payable at the start of the project and 20 per cent at the end of the first year. The machine would produce 50,000 units per annum of a new project with an estimated selling price of ₹ 3 per unit. Direct costs would be ₹ 1.75 per unit and annual fixed costs, including depreciation calculated on a straight- line basis, would be ₹ 40,000 per annum.

In the first year and the second year, special sales promotion expenditure, not included in the above costs, would be incurred, amounting to ₹ 10,000 and ₹ 15,000 respectively.

Evaluate the project using the NPV method of investment appraisal, assuming the company's cost of capital to be 10 percent.

Financial Analysis and Planning

8. The Balance Sheet of Rockwood Limited as on 31st March, 2012 is as follows:

Liabilities	₹ ('000)	Assets		₹ ('000)
Equity share capital	6,000	Fixed Assets (at cost)	16,250	
8% Preference share capital	3,250	Less: Depreciation written off	<u>5,200</u>	11,050
Reserves and Surplus	1,400	Stock		1,950
10% Debentures	1,950	Sundry debtors		2,600
Sundry Creditors	<u>3,250</u>	Cash		<u>250</u>
Total	<u>15,850</u>			<u>15,850</u>

The following additional information is available:

- (i) The stock turnover ratio based on cost of goods sold would be 6 times.
- (ii) The cost of fixed assets to sales ratio would be 1.4.
- (iii) Fixed assets costing ₹ 30,00,000 to be installed on 1st April, 2011, payment would be made on March 31, 2012.
- (iv) In March, 2012, a dividend of 7 per cent on equity capital would be paid.
- (v) ₹ 5,50,000, 11% Debentures would be issued on 1st April, 2011.

- (vi) ₹ 30,00,000, Equity shares would be issued on 31st March, 2012.
- (vii) Creditors would be 25% of materials consumed.
- (viii) Debtors would be 10% of sales.
- (ix) The cost of goods sold would be 90 per cent of sales including material 40 per cent and depreciation 5 per cent of sales.
- (x) The profit is subject to debenture interest and taxation @ 30 per cent.

You are required to:

- (i) Prepare the projected Balance Sheet as on 31st March, 2012.
- (ii) Prepare projected Cash Flow Statement in accordance with AS-3.

Working Capital Management

9. A proforma cost sheet of Fibroplast Limited is given for your consideration. It provides the following particulars:

	<i>Amount per unit</i>
	<i>(₹)</i>
Raw Materials Cost	80
Direct Labour Cost	30
Overheads Cost	60
Total Cost	170
Profit	30
Selling Price	200

The Company keeps raw material in stock, on an average for one month; work-in-progress, on an average for half a month; and finished goods in stock, on an average for one month.

The credit allowed by suppliers is one month and company allows two months credit to its debtors. The lag in payment of wages is one and a half weeks and lag in payment of overhead expenses is one month.

The Company sells one-fourth of the output against cash and maintains cash-in-hand and at bank put together at ₹ 25,000.

You are required to prepare a statement showing estimate of Working Capital needed by Fibroplast Limited to finance an activity level of 1,04,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly.

10. Differentiate between the following:

- (a) Inflation Bonds and Floating Rate Bonds
- (b) Global Depository Receipts and Euro Convertible Bonds
- (c) Debt Securitisation and Bridge Finance.

SUGGESTED ANSWERS/HINTS

1. (a) Computation of Monthly Loan Amortisation Amount

$$= \frac{₹ 6,00,000}{PVIFA_{1, 20}} = \frac{₹ 6,00,000}{18.0456} = ₹ 33,249.1$$

Monthly interest = 12 per cent/12 = 1 per cent.

(b) The answer depends on how the company has been financed.

If the company is financed mainly from short-term sources, it cannot ignore an increase in interest rates and may choose to switch to long-term financing. This will be at a higher rate and profitability will be diminished.

If the company is financed mainly from long-term sources, an increase in interest rates will not affect its profits directly. However, higher interest rates may depress economic activity and its profits may fall accordingly.

If the company is financed mainly from retained earnings or equity, an increase in the required return of shareholders will lead to pressure for higher dividends. The company may have insufficient funds to meet such demands.

(c) Proposed changes to credit policy should be evaluated in the light of the additional costs and benefits that will result from their being undertaken. For example, the cost of the introduction of cash discounts can be compared with the benefits of faster settlement of accounts in terms of reduced interest charges, and possibly also the additional business that may result. The change should only be undertaken if the marginal benefits arising from the new policy exceed its marginal costs.

(d) Wealth Maximisation Objective is Superior to the Profit Maximisation Objective

The value maximisation objective of a firm is superior to its profit maximisation objective due to following reasons.

- (i) The value maximisation objective of a firm considers all future cash flows, dividends, earning per share, risk of a decision etc. whereas profit maximisation objective does not consider the effect of EPS, dividend paid or any other returns to shareholders or the wealth of the shareholder.

- (ii) A firm that wishes to maximise the shareholders wealth may pay regular dividends whereas a firm with the objective of profit maximisation may refrain from dividend payment to its shareholders.
- (iii) Shareholders would prefer an increase in the firm's wealth against its generation of increasing flow of profits.
- (iv) The maximisation of a firm's value as reflected in the market price of a share is viewed as a proper goal of a firm as it reflects the shareholders expected return, considering the long-term prospects of the firm, reflects the differences in timings of the returns, considers risk and recognizes the importance of distribution of returns. The profit maximisation can be considered as a part of the wealth maximisation strategy.

(e) Role of Chief Financial Officer (CFO)

The chief financial officer of an organisation plays an important role in the company's goals, policies, and financial success. His responsibilities include:

- (i) *Financial analysis and planning*: Determining the proper amount of funds to employ in the firm, i.e. designating the size of the firm and its rate of growth.
- (ii) *Investment decisions*: The efficient allocation of funds to specific assets.
- (iii) *Financing and capital structure decisions*: Raising funds on favourable terms as possible, i.e., determining the composition of liabilities.
- (iv) Management of financial resources (such as working capital).
- (v) *Risk management*: Protecting assets.

2. Advise to Zeta Limited regarding Change in Credit Policy

	(₹)
Current Sales	7,20,000
Increase in Sales	20,000
New Level of Sales	7,40,000
Current Collection Period (Days)	30
Current Level of Receivables $\frac{7,20,000 \times 30}{360}$	60,000
New Level of Receivables	41,111
$\frac{7,40,000 \times 0.5}{360} + \frac{7,40,000 \times 0.5}{360}$	
Cash Discount	2%
Discount Period (Days)	10

Percentage Customers Taking Discount	50%
Bad Debt Losses	2%
Variable Cost	70%
Corporate Tax Rate	50%
Opportunity Cost of Capital	10%
(A) Increased Sales	20,000
(B) Contribution from Increased Sales, $[A \times (1-0.70)]$	6,000
(C) Bad Debt Loss, $[A \times 2\%]$	400
(D) Cost of Cash Discount: $[740,000 \times 0.02 \times 0.5]$	7400
(E) After-tax Profit, $[(B - C - D) \times (1-0.5)]$	(900)
(F) Decrease Receivable Investment, $[41,111 - 60,000]$	(18,889)
(G) Expected Return, E/F	4.8%
(H) Net Gain %, $[10\% - G]$	5.2%

3. (a) Payback Period Method

To determine the payback, compute the cumulative cash flows for each project:

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) Method

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

$$NPV_Y = -₹ 10,000 + \frac{₹ 3,500}{(112)^1} + \frac{₹ 3,500}{(112)^2} + \frac{₹ 3,500}{(112)^3} + \frac{₹ 3,500}{(112)^4} = ₹ 630.72.$$

Internal Rate of Return (IRR)

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

$$IRR_x = 18.0\%.$$

$$IRR_Y = 15.0\%.$$

Modified Internal Rate of Return (MIRR)

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

$$TV_X = ₹ 6,500(1.12)^3 + ₹ 3,000(1.12)^2 + 3,000(1.12)^1 + ₹ 1,000 = ₹ 17,255.23.$$

$$TV_Y = ₹ 3,500(1.12)^3 + ₹ 3,500(1.12)^2 + ₹ 3,500(1.12)^1 + ₹ 3,500 = ₹ 16,727.65.$$

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

$$MIRR_x = 14.61\%.$$

$$MIRR_Y = 13.73\%.$$

(b) Ranking of Projects

	<i>Project that Ranks Higher</i>
Payback	X
NPV	X
IRR	X
MIRR	X

Advise: 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.

4. (a) Computation of Costs of Different Components of Capital**Equity Shares**

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

$$= \frac{₹ 3.60 (1.09)}{₹ 54} + 0.09$$

$$= 0.0727 + 0.09 = 16.27\%.$$

Preference Shares

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

Debt at $K_d = 12\%$

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

(b) Weighted Average Cost of Capital (WACC)

$$WACC = w_d k_d (1 - T) + w_p k_p + w_e k_e$$

$$\begin{aligned} WACC &= 0.25 (7.2\%) + 0.15 (11.58\%) + 0.60 (16.27\%) \\ &= 1.8 + 1.737 + 9.762 = 13.30\%. \end{aligned}$$

5. Computation of Degree of Operating Leverage (DOL)

		Firms		
	A	B	C	D
Sale (units)	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>
Sales revenue (Units × price) (₹)	1,00,000	1,60,000	2,50,000	3,50,000
Less: Variable cost	30,000	80,000	1,00,000	2,50,000
(Units × variable cost per unit) (₹)				
Less: Fixed operating costs (₹)	<u>80,000</u>	<u>40,000</u>	<u>2,00,000</u>	<u>Nil</u>
EBIT	<u>(10,000)</u>	<u>40,000</u>	<u>(50,000)</u>	<u>1,00,000</u>

$$DOL = \frac{\text{Current sales (S) - Variable costs (VC)}}{\text{Current EBIT}}$$

$$DOL_{(A)} = \frac{\text{₹ } 1,00,000 - \text{₹ } 30,000}{\text{₹ } 10,000} = 7$$

$$DOL_{(B)} = \frac{\text{₹ } 1,60,000 - \text{₹ } 80,000}{\text{₹ } 40,000} = 2$$

$$DOL_{(C)} = \frac{\text{₹ } 2,50,000 - \text{₹ } 1,00,000}{\text{₹ } 50,000} = 3$$

$$DOL_{(D)} = \frac{\text{₹ } 3,50,000 - \text{₹ } 2,50,000}{\text{₹ } 1,00,000} = 1$$

The operating leverage exists only when there are fixed costs. In the case of firm D, there is no magnified effect on the EBIT due to change in sales. A 20 per cent increase in sales has resulted in a 20 per cent increase in EBIT. In the case of other firms,

operating leverage exists. It is maximum in firm A, followed by firm C and minimum in firm B. The interception of DOL of 7 is that 1 per cent change in sales results in 7 per cent change in EBIT level in the direction of the change of sales level of firm A.

$$6. (a). (i) \quad DSO = \frac{\text{Accounts receivable}}{\text{Sales} / 365}$$

$$40.55 = \frac{\text{Accounts Receivable}}{\text{Sales} / 365}$$

$$\text{Accounts Receivable} = 40.55 (\text{₹ } 0.27397) = \text{₹ } 11.11 \text{ crores.}$$

$$(ii) \quad \text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = 3.0$$

$$= \frac{\text{Current assets}}{\text{₹ } 10.55} = 3.0$$

$$\text{Current Assets} = 3.0 (\text{₹ } 10.55) = \text{₹ } 31.65 \text{ crores.}$$

$$(iii) \quad \text{Total assets} = \text{Current assets} + \text{Fixed assets} \\ = \text{₹ } 31.65 + \text{₹ } 28.35 = \text{₹ } 60 \text{ crores.}$$

$$(iv) \quad \text{ROA} = \text{Profit margin} \times \text{Total assets turnover}$$

$$= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}$$

$$= \frac{\text{₹ } 5}{\text{₹ } 100} \times \frac{\text{₹ } 100}{\text{₹ } 60} = 0.05 \times 1.667 = 0.083333 = 8.3333\%.$$

$$(v) \quad \text{ROE} = \text{ROA} \times \frac{\text{Assets}}{\text{Equity}}$$

$$12\% = 8.3333\% \times \frac{\text{₹ } 60}{\text{Equity}}$$

$$\text{Equity} = \frac{(8.3333\%) (\text{₹ } 60)}{12.0\%} = \text{₹ } 41.67 \text{ crores.}$$

Or, we can also find equity as follows:

$$\text{ROE} = \frac{\text{Net income}}{\text{Equity}}$$

$$12.0\% = \frac{\text{₹ } 5}{\text{Equity}}$$

$$\text{quity} = \frac{\text{₹ } 5}{0.12} = \text{₹ } 41.67 \text{ crores.}$$

Then, we could have gone on to find long-term debt.

(vi) Total assets = Total claims = ₹ 60 crores

Current liabilities + Long-term debt + Equity = ₹ 60 crores

₹ 10.55 + Long-term debt + ₹ 41.67 = ₹ 60 crores

Long-term debt = ₹ 60 – ₹ 10.55 – ₹ 41.67 = ₹ 7.78 crores.

(b) Ganpati Forgings Limited's average sales per day was ₹ 100/365 = ₹ 0.274 crore. Its DSO was 40.55, so A/R = 40.55 (₹ 0.274 crore) = ₹ 11.11 crores. Its new DSO of 30.4 would cause A/R = 30.4 (₹ 0.274 crore) = ₹ 8.33 crores. The reduction in receivables would be ₹ 11.11 – ₹ 8.33 crores = ₹ 2.78 crores, which would equal the amount of cash generated.

(i) New equity = Old equity – Shares bought back

= ₹ 41.67 – ₹ 2.78

= ₹ 38.89 crores.

Thus,

$$\text{New ROE} = \frac{\text{Net income}}{\text{New equity}} = \frac{\text{₹ } 5}{\text{₹ } 38.89} = 12.86\% \text{ (versus old ROE of 12.0\%).}$$

$$\begin{aligned} \text{(ii) New ROE} &= \frac{\text{Net income}}{\text{Total assets} - \text{Reduction in A/R}} = \frac{\text{₹ } 5}{\text{₹ } 60 - \text{₹ } 2.78} \\ &= 8.74\% \text{ (versus old ROA of 8.33\%).} \end{aligned}$$

(iii) The old debt is the same as the new debt:

Debt = Total claims – Equity

₹ 60 – ₹ 41.67 = ₹ 18.33 crores.

Old total assets = ₹ 60 crores.

New total assets = Old total assets – Reduction in A/R

= ₹ 60 – ₹ 2.78

= ₹ 57.22 crores.

Therefore,

$$\frac{\text{Debt}}{\text{Old total assets}} = \frac{\text{₹ } 18.33}{\text{₹ } 60} = 30.6\%,$$

While,

$$\frac{\text{New debt}}{\text{New total assets}} = \frac{\text{₹ 18.33}}{\text{₹ 57.22}} = 32.0\%.$$

7. Evaluation of a Project for Dryash Limited

Calculation of Net Cash flows

$$\text{Contribution} = (3.00 - 1.75) \times 50,000 = \text{₹ } 62,500$$

$$\text{Fixed Costs} = 40,000 - (1, 25,000 - 30,000)/5 = \text{₹ } 21,000$$

Year	Capital (₹)	Contribution (₹)	Fixed costs (₹)	Adverts (₹)	Net cash flow (₹)
0	(1,00,000)				(1,00,000)
1	(25,000)	62,500	(21,000)	(10,000)	6,500
2		62,500	(21,000)	(15,000)	26,500
3		62,500	(21,000)		41,500
4		62,500	(21,000)		41,500
5	30,000	62,500	(21,000)		71,500

Calculation of Net Present Value

Year	Net Cash Flow (₹)	10% Discount Factor	Present Value (₹)
0	(1,00,000)	1.000	(1,00,000)
1	6,500	0.909	5,909
2	26,500	0.826	21,889
3	41,500	0.751	31,167
4	41,500	0.683	28,345
5	71,500	0.621	44,402
			31,712

The net present value of the project is ₹ 31,712.

8. (i) Calculation of Sales

$$\text{Fixed assets ₹ } (1,62,50,000 + 30,00,000) = 1,92,50,000$$

$$\text{Sales} = \frac{1,92,50,000}{14} = 1,37,50,000$$

Cost of Goods Sold	= 1,37,50,000 × .90	= 1,23,75,000
Material	= 1,37,50,000 × .40	= 55,00,000
Depreciation	= 1,37,50,000 × .05	= 6,87,500
Net profit	= 1,37,50,000 × .10	= 13,75,000

Calculation of Net Fixed Assets

		₹
Opening Balance		1,62,50,000
Add: Purchases		<u>30,00,000</u>
		<u>1,92,50,000</u>
Less: Accumulated Depreciation	52,00,000	
Additional Depreciation	<u>6,87,500</u>	<u>58,87,500</u>
Closing Balance of Fixed Assets		<u>1,33,62,500</u>

Calculation of Closing Stock

$$\text{Average stock} = \frac{\text{Cost of goods sold}}{\text{Stock turnover ratio}}$$

$$= \frac{1,23,75,000}{6} = 20,62,500$$

$$\text{Average stock} = \frac{(\text{Opening stock} + \text{Closing stock})}{2}$$

$$20,62,500 = \frac{(19,50,000 + \text{Closing stock})}{2}$$

$$\text{Closing Stock} = 41,25,000 - 19,50,000 = 21,75,000$$

$$\text{Calculation of Debtors} = 1,37,50,000 \times .10 = 13,75,000$$

$$\text{Calculation of Creditors} = 55,00,000 \times .25 = 13,75,000$$

Calculation of Interest and Provision for Taxation

$$\text{Net profit} = 13,75,000$$

$$\text{Less: Interest (19,50,000 × 10\%)} = \underline{2,55,500}$$

$$(5,50,000 \times 11\%) = 11,19,500$$

$$\text{Less: Taxes} = \underline{3,35,850}$$

$$\text{Net Profit Available For Dividend} = 7,83,650$$

Less: Preference Share Dividend	2,60,000
Less: Equity Dividend @ 7%	<u>4,20,000</u>
Transfer to Reserves and Surplus	<u>1,03,650</u>
Reserves and Surplus	
Opening Balance	14,00,000
Add: Current Balance	<u>1,03,650</u>
	<u>15,03,650</u>

Projected Cash Flow Statement for the year ending 31st March, 2012

(i) Cash flow from Operating Activities	₹
Profit after Taxation	7,83,650
Depreciation added back	<u>6,87,500</u>
	14,71,150
Add: Increase in Current Liabilities and Decrease in Current Assets	
Provision for Taxation	3,35,850
Debtors (26,00,000 – 13,75,000)	12,25,000
Less: Increase in Current Assets and Decrease in Current Liabilities	
Stock (21,75,000 – 19,50,000) (2,25,000)	
Creditors (13,75,000 – 32,50,000) (18,75,000)	<u>(21,00,000)</u>
Net Cash from Operating Activities	9,32,000
(ii) Cash flow from Investing Activities	
Purchase of Fixed Assets	(30,00,000)
(iii) Cash flow from Financing Activities	
Issue of Debenture 5,50,000	
Issue of Equity Share Capital 30,00,000	
Dividend Paid (6,80,000)	<u>28,70,000</u>
Net Increase in Cash	8,02,000
Opening Balance of Cash	<u>2,50,000</u>
Closing Balance	<u>10,52,000</u>

Projected Balance Sheet as on 31st March, 2012

<i>Liabilities</i>	<i>₹ ('000)</i>	<i>Assets</i>	<i>₹ ('000)</i>
Equity share capital	9,000	Fixed Assets (at cost) 19,250	
8% Preference share capital	3,250	Less: Depreciation written off 5,887.5	13,362.5
Reserves & Surplus	1,503.65	Stock	2,175
10% & 11% Debentures	2,500	Sundry debtors	1,375
Sundry Creditors	1,375	Cash	1,052
Provision for taxation	<u>335.85</u>		
Total	<u>17,964.5</u>	Total	<u>17,964.5</u>

9.

Activity level: 1,04,000 units**Statement showing Estimate of Working Capital Needs**

	<i>Per unit</i>	<i>Total</i>
Raw Material	80	83,20,000
Direct Labour	30	31,20,000
Overheads	60	62,40,000
Total Cost	170	1,76,80,000
Profit	30	31,20,000
Selling Price	200	2,08,00,000
Units Produced & Sold	1,04,000	
Cash Sales	52,00,000	
Credit Sales	1,56,00,000	
Raw Material Consumption	83,20,000	
Cost of Production	1,76,80,000	
Current Assets:	Days	Amount
Raw material inventory $\frac{1,04,000 \times 30}{360} \times ₹ 80$	30	6,93,333
Materials in Process $\frac{1,04,000 \times 15}{360} \times ₹ 170$	15	7,36,667

Finished Goods $\frac{₹1,04,000}{₹} \times \frac{30}{360} \times ₹170 \div \emptyset$	30	14,73,333
Debtors $\frac{₹1,04,000}{₹} \times \frac{3}{4} \times \frac{60}{360} \times ₹200 \div \emptyset$	60	26,00,000
Cash Balance		25,000
Total Current Assets		55,28,333
<i>Current Liabilities:</i>		
Creditors $\frac{₹1,04,000}{₹} \times \frac{30}{360} \times 80 \div \emptyset$	30	6,93,333
Wages $\frac{₹1,04,000}{₹} \times \frac{10}{360} \times 30 \div \emptyset$	10	86,667
Overheads $\frac{₹1,04,000}{₹} \times \frac{30}{360} \times 60 \div \emptyset$	30	5,20,000
Total Current Liabilities		13,00,000
Net Working Capital (before adding contingencies)		42,28,333
Add: 10% Contingencies		4,22,833
<i>Net Working Capital</i>		46,51,167

10. (a) Inflation Bonds and Floating Rate Bonds

Inflation Bonds are the bonds in which interest rate is adjusted for inflation. Thus, the investor gets interest which is free from the effects of inflation. For example, if the interest rate is 11 per cent and the inflation is 5 per cent, the investor will earn 16 per cent meaning thereby that the investor is protected against inflation.

On the other hand, Floating Rate Bonds are the bonds where the interest rate is not fixed and is allowed to float depending upon the market conditions. This is an ideal instrument which can be resorted to by the issuers to hedge themselves against the volatility in the interest rates.

(b) Global Depository Receipts and Euro Convertible Bonds

Global Depository Receipts are negotiable certificates denominated in US dollars which represent a Non-US company's publicly traded local currency equity shares. GDRs are created when the local currency shares of an Indian company are delivered to Depository's local custodian Bank against which the Depository bank issues depository receipts in US dollars. The GDRs may be traded freely in the overseas market like any other dollar-expressed security either on a foreign stock exchange or in the over-the-counter market or among qualified institutional buyers.

On the other hand, Euro Convertible Bonds are quasi-debt securities (unsecured) which can be converted into depository receipts or local shares. ECBs offer the investor an option to convert the bond into equity at a fixed price after the minimum lock in period. The price of equity shares at the time of conversion will have a premium element. The bonds carry a fixed rate of interest. ECBs issues are listed at London or Luxembourg stock exchanges.

(c) Debt Securitisation and Bridge Finance

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

Bridge Finance, on the other hand, refers to loans taken by a company normally from commercial banks for a short period, pending disbursement of loans sanctioned by financial institutions. Normally, it takes time for financial institutions to disburse loans to companies. However, once the loans are approved by the term lending institutions, companies, in order not to lose further time in starting their projects, arrange short term loans from commercial banks.