

PAPER – 3 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I : COST ACCOUNTING

QUESTIONS

Material

1. HTC Ltd. is a manufacturer of laptops and for this it requires microprocessors. A laptop requires one microprocessor. The current market demand for the HTC's laptop is 1,40,000 units per annum.

The cost of placing an order is ₹13,500

Purchase price per unit inclusive of shipment charges is ₹6,000

Annual cost of storage per unit is ₹32.5

Orders are delivered within 4 to 8 weeks and for emergency purchase it takes 2 weeks.

Rate of usage of microprocessor is 1500 units to 2800 units per week.

From the above details you are required to calculate (i) Re-order quantity (ii) Re-ordering level (iii) Maximum level (iv) Minimum level and (v) Danger level.

Labour

2. The following labour turnover rates were calculated for the year ended 2011-12 as 12%, 6% and 4% under Flux method, Replacement method and Separation method respectively. If the number of workers replaced during the year were 36, then find out the number of (i) workers left and discharged and. (ii) workers recruited and joined.

Overheads

3. NM Ltd. is a manufacturing company having three production departments X, Y and Z and two service departments P and Q. The following is the budget for the year 2012-13.

	Total (₹)	X (₹)	Y (₹)	Z (₹)	P (₹)	Q (₹)
Direct Materials		20,000	35,000	40,000	15,000	25,000
Direct wages		35,000	48,000	26,000	25,000	28,000
Factory rent	42,000					
Power	30,000					
Depreciation	24,000					
Other overheads	84,000					

Additional Information:

Area (Square feet)	1200	600	900	150	150
Capital value of assets (₹ in lakh)	15	30	15	10	5

Machine hours	1,500	3,000	4,200	1,200	900
Horse power of machines	120	80	40	30	30

A technical assessment of the apportionment of expenses of service departments is as under:

	X	Y	Z	P	Q
Service Department P	40%	20%	25%	-	15%
Service Department Q	55%	15%	10%	20%	-

You are required to compute:

- A statement showing distribution of overheads to various departments.
- A statement showing re-distribution of service department's expenses to production departments.

Non Integrated Accounts

4. The following balances were extracted from a company's ledger as on 31st Dec 2011

	₹	₹
Raw materials control account	42,000	
Work-in-progress control account	16,000	
Finished stock control account	24,000	
Nominal ledger control account		82,000
	82,000	82,000

Further transactions took place during the following quarter as follows:

	₹
Factory overhead-allocated to WIP	11,500
Goods finished-at cost	38,800
Raw materials purchased	32,400
Direct wages-allocated to WIP	19,300
Cost of goods sold	46,000
Raw materials-issued to production	21,000
Raw materials-credited by suppliers	1,200
Inventory audit-raw material losses	1,000
WIP rejected (with no scrap value)	1,300
Customer's returns(at cost) of finished goods	3,400

Prepare all the Ledger Accounts in Cost Ledger

Method of Costing (I)

5. An Executive manager spends ₹10.00 per kilometer on taxi fares for his office work. He is considering two other alternatives, the purchase of a new Nano car or a second hand Innova car. The estimated cost figures are as follows:

Items	New Nano Car	Old Innova Car
Purchase Price	₹1,35,000	₹1,60,000
Sale price, after 5 years	₹25,000	₹40,000
Repairs and servicing per annum	₹12,000	₹18,000
Taxes and insurance per annum	₹3,200	₹2,400
Petrol consumption per liter	20 km	15 km
Petrol/ Diesel price, per liter	₹68.00	₹42.00

He estimates that he has to travel 10,800 km annually. Which of the three alternatives will be economical? If his official visit increases and he has to do 18,000 km per annum what should be his decision?

At how many km per annum will the cost of the two cars break-even and why? Ignore interest and income-tax.

Method of Costing (II)

6. While manufacture of the main product 'A' two by-products 'P' and 'Q' emerge. The joint expenses of manufacture amount to ₹1,67,550. All the three products are processed further separation and sold as per details given below:

	Main Product	By Products	
	'A'	'P'	'Q'
Sales (₹)	1,30,000	70,000	50,000
Cost incurred after separation (₹)	8,000	7,000	6,000
Profit as percentage on sales (%)	20	10	15

Total fixed selling expenses are 10% of total cost of sales which are apportioned to the three products in the ratio of 5:3:2

Prepare a statement showing the appointment of joints costs to the main product and two by-products.

Standard Costing

7. Broyhill Furnitures makes curio cabinets for various museums and art galleries. It makes 7 curio cabinets per hour by employing 5 skilled, 10 semiskilled and 20 unskilled workers. The standard wage rate is ₹ 24 per labour hour. During the last week workers worked for

56 hours and made 400 curio cabinets. 2% of the time paid was lost due to the abnormal reasons. The actual hourly rate paid to skilled, semiskilled and unskilled workers were ₹30, ₹24 and ₹18 respectively. You are required to calculate (i) Labour Cost Variance (ii) Labour Rate Variance (iii) Labour Efficiency Variance and (iv) Idle Time Variance.

Marginal Costing

8. Marlboro Ltd. has two factories for producing cigarettes of identical quality. The figures of F/Y 2011-12 are as follows:

	Factory-A	Factory-B
Selling price per packet (₹)	75	75
Variable cost per packet (₹)	60	65
Fixed cost (₹)	3,10,000	2,15,000
Sales (units)	35,000	40,000
Production capacity (units)	40,000	45,000

Fixed cost includes depreciation on plant and machinery in factory A and factory B ₹40,000 and ₹ 38,000 respectively. You are required to calculate:

- Break-even Point in sales and units for each factory separately.
- Cash BEP in units for each factory separately.
- BEP in units for company as a whole. Current product mix of factory A and factory B is 1:2.

Budgets and Budgetary Control

9. Blueberry Ltd. is producing two products namely I-Phone and Tablet PC. Each unit of I-Phone and Tablet PC takes 12 hours and 14 hours respectively for production. During the F/Y 2011-12 Blueberry produced 15,000 units of I-Phone and 10,000 units of Tablet PC. Budgeted machine hours were 3,10,000 hours whereas actual machine hours were 3,00,000 hours. You are required to compute various control ratios.

Miscellaneous.

10. (i) State the unit of cost of the following industry
- Airlines
 - Hospitals
 - Power
 - Hotel
- (ii) Write a very brief note on 'escalation clause' and 'retention money'.
- (iii) What is equivalent production unit?

(iv) Write a brief note about 'blanket overhead rate'.

SUGGESTED ANSWERS/HINTS

Cost Accounting

1. (i) Re-order quantity = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 1,40,000 \times 13,500}{32.5}} = 10,785 \text{ units}$
- (ii) Re-ordering Level = Maximum usage x Maximum re-order period
 $= 2800 \text{ units} \times 8 \text{ weeks} = 22,400 \text{ units}$
- (iii) Maximum Level = Re-order level + Re-order quantity –
 $(\text{Minimum usage} \times \text{Minimum re-order period})$
 $= 22,400 + 10,785 - (1500 \text{ units} \times 4 \text{ weeks})$
 $= 33,185 - 6,000$
 $= 27,185 \text{ units}$
- (iii) Minimum Level = Re-order level – (Average usage x Average re-order period)
 $= 22,400 - (2,150 \text{ units} \times 6 \text{ weeks})$
 $= 22,400 - 12,900$
 $= 9,500 \text{ units}$
- (iv) Danger Level = Average consumption x Re-order period in emergency condition
 $= 2,150 \text{ units} \times 2 \text{ weeks}$
 $= 4,300 \text{ units}$

2. Labour turnover rate (Replacement method) = $\frac{\text{No. of worker Replaced}}{\text{Average No. of worker s}}$

$$\frac{6}{100} = \frac{36}{\text{Average No. of worker s}}$$

$$\text{Average No. of workers} = 36 \times \frac{100}{6} = 600$$

- (i) calculation of No. of workers left and discharged

$$\text{Labour turnover rate (Separation method)} = \frac{\text{No. of Separations}}{\text{Average No. of worker s}}$$

$$\frac{4}{100} = \frac{\text{No. of Separations}}{600}$$

$$\text{No. of Separations} = \frac{600 \times 4}{100} = 24$$

Thus, the number of workers left and discharged = 24

(ii) calculation of workers recruited and joined

$$\text{Labour turnover rate (Flux method)} = \frac{\text{No. of Separations} + \text{No. of workers joined}}{\text{Average No. of workers}}$$

$$\frac{12}{100} = \frac{24 + \text{No. of workers joined}}{600}$$

$$\begin{aligned} \text{No. of workers joined} &= \frac{600 \times 12}{100} = 72 \\ &= 72 - 24 = 48 \end{aligned}$$

3. (i) Primary Distribution of Overheads

Expenses	Basis	Total	Production Deptt.			Service Deptt.	
			X	Y	Z	P	Q
Direct material	Actual	40,000	-	-	-	15,000	25,000
Direct Wages	Actual	53,000	-	-	-	25,000	28,000
Factory rent	Area	42,000	16,800	8,400	12,600	2,100	2,100
Power	H.P x Machine hours	30,000	8,295	11,060	7,742	1,659	1,244
Depreciation	Capital value x machine hours	24,000	2,812	11,250	7,875	1,500	563
Other overheads	Direct wages	84,000	18,148	24,889	13,481	12,963	14,519
Total overheads		2,73,000	46,055	55,599	41,698	58,222	71,426

(ii) Re-distribution of Overheads of Service Department P and Q

Total overheads of Service Departments may be distributed using simultaneous equation method

Let, the total overheads of P = x and the total overheads of Q = y

$$x = 58,222 + 0.2 \text{ of } y \dots (i)$$

$$y = 71,426 + 0.15 \text{ of } x \dots (ii)$$

$$\text{or, } x - 0.2y = 58,222 \quad .(i)10$$

$$\text{or, } -0.15x + y = 71,426 \quad (ii)-2$$

$$10x - 2y = 5,82,220 \quad (iii)$$

$$0.3x - 2y = -1,42,852 \dots \quad .(iv)$$

$$\begin{array}{r} - \\ + \\ + \end{array}$$

$$9.7x = 7,25,072$$

$$x = 74,750$$

Putting the value of x in equation (i), we get

$$74,750 - 0.2y = 58,222$$

$$-0.2y = 58,222 - 74,750$$

$$Y = 16528 / 0.2 = 82,640$$

Secondary Distribution of Overheads

	Production Departments		
	X (₹)	Y (₹)	Z (₹)
Total overhead as per primary distribution	46,055	55,599	41,698
Service Department P (85% of 74750)	29,900	14,950	18,688
Service Department Q (80% of 82640)	45,452	12,396	8,264
Total	1,21,407	82,945	68,650

4.

Raw Material Control Account

	₹		₹
To Balance b/d	42,000	By WIP control A/c	21,000
To Nominal Ledger Control A/c	32,400	By Nominal Ledger Control A/c	1,200
		By Nominal Ledger Control A/c	1,000
		By Balance c/d	51,200
	74,400		74,400

Work in progress Control Account

	₹		₹
To Balance b/d	16,000	By Finished Goods Control A/c	38,800
To Nominal Ledger Control A/c	11,500	By Nominal Ledger Control A/c	1,300
To Nominal Ledger Control A/c	19,300	By Balance c/d	27,700
To Raw Material Control A/c	21,000		
	67,800		67,800

Finished Goods Control Account

	₹		₹
To Balance b/d	24,000	By Nominal Ledger Control A/c	46,000
To WIP Control A/c	38,800	By Balance c/d	20,200
To Nominal Ledger Control A/c	3,400		
	66,200		66,200

Nominal Ledger Control Account

	₹		₹
To Raw Material Control A/c	1,200	By Balance b/d	82,000
To Finished Stock Control A/c	46,000	By Raw Material Control A/c	32,400
To Raw Material Control A/c	1,000	By WIP Control A/c	11,500
To WIP Control A/c	1,300	By WIP Control A/c	19,300
To Balance c/d	99,100	By Finished Stock Control A/c	3,400
	1,48,600		1,48,600

5. Statement showing comparative costs of alternatives modes of conveyance

Item	New Nano Car	Old Innova Car	Taxi
	₹	₹	₹
Fixed costs per annum:			
Depreciation	22,000	24,000	
Repairs and servicing	12,000	18,000	
Taxes and insurance	3,200	2,400	
(A) Total	37,200	44,400	
Variable costs per annum:			
(B) Petrol/ Diesel: 10,800km	36,720	30,240	
(C) Petrol/ Diesel: 18,000 km	61,200	50,400	
Total Costs:			
10,800 km (A+B)	73,920	74,640	1,08,000
18,000 km (A+C)	98,400	94,800	1,08,000

Conclusion. For present official tour of 10,800 km, the total cost for the new Nano car is the lowest and thus this is the cheapest alternative. But when official tour increases to 18,000 km per annum the old Innova car will be cheapest.

$$\text{Break-even point} = \frac{\text{Difference in fixed cost between old Innova and new Nano}}{\text{Difference in variable cost per km between old Innova and new Nano}}$$

$$= \frac{\text{₹ } 44,400 - \text{₹ } 37,200}{\text{₹ } 3.40 - \text{₹ } 2.80} = \frac{7,200}{0.60} = 12,000 \text{ km}$$

At 12,000 km per year, the costs of operation of the two cars will break-even. This is shown below:

Total cost = Fixed cost + Variable cost at 12,000 km

For new Nano car, total cost = 37,200 + 40,800 = ₹ 78,000

For old Innova car, total cost = 44,400 + 33,600 = ₹ 78,000

6. Statement of apportionment of Joint Cost

	Total	Main product	By Product	
		P	A	P
	₹	₹	₹	₹
Sales	2,50,000	1,30,000	70,000	50,000
Less: Profit	40,500	26,000	7,000	7,500
Cost of sales	2,09,500	1,04,000	63,000	42,500
Less: Selling and distribution expenses (10% of 2,09,500 i.e. 20,950 apportioned in the ration of 5:3:2)	20,950	10,475	6,285	4,190
Cost of production	1,88,550	93,525	56,715	38,310
Less: After split-off cost	21,000	8,000	7,000	6,000
Share in Joint Cost	1,67,550	85,525	49,715	32,310

7. Total labour hours required to make 7 curio cabinets = 5 skilled hours + 10 semi-skilled hours + 20 unskilled hours i.e. 35 labour hours.

Standard labour hours per unit = 35/7 = 5 labour hours

Standard labour hours for actual output = 400 units x 5 = 2000 hours

Standard cost for actual output = 2000 hours x ₹ 24 = ₹48,000

Actual hours paid and Idle hours

Worker	Actual hours paid	Idle time(hours)	Actual hours worked	Rate per hour (₹)	Amount Paid (₹)
Skilled	5 x 56 = 280	280 x 2% = 5.6	280 - 5.6 = 274.4	30	8,400

Semi-skilled	10 x 56 = 560	560 x 2% = 11.2	560 - 11.2 = 548.8	24	13,440
Unskilled	20 x 56 = 1120	1120 x 2% = 22.4	1120 - 22.4 = 1097.6	18	20,160
Total	1960	39.2	1920.8		42,000

Calculation of Variances

Labour Cost Variance = Standard Cost for actual output – Actual cost
= ₹48,000 - ₹42,000
= ₹6,000 (F)

Labour Rate Variance = Actual hours paid (Standard rate – Actual rate)

Skilled worker = 280 (24 – 30) = ₹1,680 (A)

Semi-skilled worker = 560 (24 – 24) = Nil

Unskilled worker = 1120 (24 – 18) = ₹6,720 (F) ₹5,040 (F)

Idle time Variance = Idle Time x Standard rate
= 39.2 x 24 = ₹940.80 (A)

Labour Efficiency Variance = Std. Rate (Standard hours – Actual hours worked)

Skilled worker = 24 (5/7 x 400 – 274.4)
= 24 (2000/7 – 274.4)
= ₹271.54 (F)

Semi-skilled worker = 24(10/7 x 400 – 548.8)
= 24(4000/7 – 548.8)
= ₹543.09 (F)

Unskilled Worker = 24(20/7 x 400 – 1097.6)
= 24[8,000/7 – 1097.6]
= ₹1,086.17 (F) ₹1900.80 (F)

8. Computation of Break-even Point (BEP) for each factory separately

(i)

Sl no.		Factory A (₹)	Factory B (₹)
I	Selling Price per packet	75	75
II	Variable cost per packet	60	65

III	Contribution per packet [I-II]	15	10
IV	P/V ratio [III/I x 100] (%)	20	13.33
V	Fixed cost	3,10,000	2,15,000
VI	BEP (units) [V/III]	20,667	21,500
VII	BEP (Sales) [V/ IV]	15,50,000	16,12,500

(ii) Cash BEP (units)

$$= \frac{\text{Fixed cost} - \text{Depreciation}}{\text{Contribution per unit}}$$

$$\text{Factory A} = \frac{3,10,000 - 40,000}{15} = 18,000 \text{ packets}$$

$$\text{Factory B} = \frac{2,15,000 - 38,000}{10} = 17,700 \text{ packets}$$

(iii) Computation of combined Break-even Point (units)

$$= \frac{\text{Combined Fixed cost}}{\text{Combined Contribution per unit}}$$

$$= \frac{3,10,000 + 2,15,000}{15 \times \frac{1}{3} + 10 \times \frac{2}{3}} = \frac{5,25,000}{11.666} = 45,000 \text{ packets}$$

9. Calculation of various Control Ratios

$$\begin{aligned} \text{(i) Capacity Ratio} &= \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100 \\ &= \frac{3,00,000}{3,10,000} \times 100 = 96.77\% \end{aligned}$$

$$\begin{aligned} \text{(ii) Efficiency Ratio} &= \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100 \\ &= \frac{[(15,000 \times 12) + (10,000 \times 14)]}{3,00,000} \times 100 \\ &= \frac{3,20,000}{3,00,000} \times 100 = 106.67\% \end{aligned}$$

$$\text{(iii) Activity Ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

$$= \frac{3,20,000}{3,10,000} \times 100$$

Or

Capacity Ratio x Efficiency Ratio

$$= 96.77\% \times 106.67\% = 103.23\%$$

10. (i) **Industry** **Unit of Cost**
- | | |
|--------------|--|
| (a) Airlines | – Per passenger miles or per tonne miles |
| (b) Hospital | – Per patient – day |
| (c) Power | – Per Kilo – Watt (kw) hour |
| (d) Hotel | – Per room day / or per meal |
- (ii) **Escalation Clause:** This clause is usually provided in the contracts as a safeguard against any likely changes in the price or utilization of material and labour. If during the period of execution of a contract, the prices of materials or labour rise beyond a certain limit, the contract price will be increased by an agreed amount.

Retention Money in Contract Costing: A contractor does not receive the full payment of the work certified by the surveyor. Contractee retains some amount to be paid, after some time, when it is ensured that there is no default in the work done by the contractor. If any deficiency or defect is noticed, it is to be rectified by the contractor before the release of the retention money. Thus, the retention money provides a safeguard against the default risk in the contracts.

- (iii) When opening and closing stocks of work-in-process exist, unit costs cannot be computed by simply dividing the total cost by total number of units still in process. One can convert the work-in-process units into finished units called equivalent units so that the unit cost of these units can be obtained.

$$\begin{array}{lcl} \text{Equivalent} & \text{Actual number of} & \text{Percentage of} \\ \text{completed units} & = \text{units in the process} & \times \text{work completed} \\ & \text{of manufacture} & \end{array}$$

It consists of balance of work done on opening work-in-process, current production done fully and part of work done on closing WIP with regard to different elements of costs viz., material, labour and overhead.

- (iv) Blanket overhead rate is one single overhead absorption rate for the whole factory. It may be computed by using the following formulae:

$$\text{Blanket overhead rate} = \frac{\text{Overhead costs for the whole factory}}{\text{* Total units of the selected base}}$$

* The selected base can be the total output; total labour hours; machine hours etc.

PART II: FINANCIAL MANAGEMENT**QUESTIONS**

1. Answer the following, supporting the same with reasoning/working notes:
 - (a) Whether the present value decreases at a linear rate, at an increasing rate, or at a decreasing rate with the discount rate and why?
 - (b) Which ratio would a rich investor interested in investing in equity shares most likely consult while considering the financing of seasonal inventory?
 - (c) Which is the most important variable in arriving at accurate projections while preparing a cash budget and why?
 - (d) The credit policy of Firm "A" is – A high percentage of bad-debt loss but normal receivable turnover and credit rejection rate. What is the effect of this policy on sales and profit?
 - (e) Do you think costs are associated with trade credit and accruals when they are used as source of working capital?

Working Capital Management

2. Mahalaxmi Limited, dealing in textiles, provides the following information for your consideration:

	₹
Cost (per unit):	
Raw materials	52.0
Direct labour	19.5
Overheads	39.0
Total cost (per unit)	110.5
Profit	19.5
Selling price	130.0

Average raw material in stock is one month; average materials in process is half a month. Credit allowed by suppliers is one month; credit allowed to debtors is two months. Time lag in payment of wages is one and a half weeks and Overheads is one month. One-fourth of sales are on cash basis. Cash balance is expected to be ₹ 1,20,000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 70,000 units of output. You may assume that production is carried on evenly, throughout the year and wages and overheads accrue similarly.

Investment Decisions

3. Ganapati Limited is considering the following investment projects:

<i>Cash Flows (₹)</i>				
<i>Projects</i>	C_0	C_1	C_2	C_3
A	-10,000	+10,000		
B	-10,000	+17,500	+7,500	
C	-10,000	+12,000	+4,000	+12,000
D	-10,000	+10,000	+3,000	+13,000

Rank the projects according to each of the following methods: (i) Payback, (ii) ARR, (iii) IRR and (iv) NPV; assuming discount rates of 10 and 30 per cent.

Assuming the projects are independent, which one should be accepted?

Financing Decisions

4. Technomate Limited has the following capital structure:

9% Debentures	₹ 2,75,000
11% Preference Shares	₹ 2,25,000
Equity Shares (face value : ₹ 10 per share)	<u>₹ 5,00,000</u>
	<u>₹ 10,00,000</u>

Additional information:

- ₹ 100 per debenture redeemable at par has 2% floatation cost and 10 years of maturity. The market price per debenture is ₹ 105.
- ₹ 100 per preference share redeemable at par has 3% floatation cost and 10 years of maturity. The market price per preference share is ₹ 106.
- Equity share has ₹ 4 floatation cost and market price per share of ₹ 24. The next year expected dividend is ₹ 2 per share with annual growth of 5%. The firm has a practice of paying all earnings in the form of dividends.
- Corporate Income-tax rate is 35%.

You are required to calculate Weighted Average Cost of Capital (WACC) using market value weights.

Financing Decisions

5. Kalyani Steels Limited requires ₹ 5,00,000 for construction of a new plant. It is considering three financial plans:
- The company may issue 50,000 ordinary shares at ₹ 10 per share;

(ii) The company may issue 25,000 ordinary shares at ₹ 10 per share and 2,500 debentures of ₹ 100 denominations bearing a 8 per cent rate of interest; and

(iii) The company may issue 25,000 ordinary shares at ₹ 10 per share and 2,500 preference shares at ₹ 100 per share bearing a 8 per cent rate of dividend.

If Kalyani Steels Limited's earnings before interest and taxes are ₹ 10,000; ₹ 20,000; ₹ 40,000; ₹ 60,000 and ₹ 1,00,000, you are required to compute the earnings per share under each of the three financial plans? Which alternative would you recommend for Kalyani Steels and why?

Financial Analysis and Planning

6. The total sales (all credit) of Celloplast Limited are ₹ 6,40,000. It has a gross profit margin of 15 per cent and a current ratio of 2:5. It's current liabilities are ₹ 96,000; inventories ₹ 48,000 and cash ₹ 16,000.

You are required to determine:

- The average inventory to be carried by Celloplast Limited, if an inventory turnover of 5 times is expected? (Assume a 360-day year),
- The average collection period if the opening balance of debtors is intended to be ₹ 80,000? (Assume a 360-day year).

Investment Decisions

7. Carlson Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at the same cost of ₹ 5 lakhs each. Salvage value of the old machine is ₹ 1 lakh. The utilities of the existing machine can be used if Carlson purchases machine A. Additional cost of utilities to be purchased in that case are ₹ 1 lakh. If it purchases machine B then all the existing utilities will have to be replaced with new utilities costing ₹ 2 lakhs. The salvage value of the old utilities will be ₹ 0.20 lakhs. The earnings after taxation are expected to be:

Year	(Cash inflows)		
	A ₹	B ₹	P.V. Factor @ 15%
1.	1,00,000	2,00,000	0.87
2.	1,50,000	2,10,000	0.76
3.	1,80,000	1,80,000	0.66
4.	2,00,000	1,70,000	0.57
5.	1,70,000	40,000	0.50
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%. You are required to:

- (i) Compute the net present value, discounted payback period and desirability factor for the two machines; and
- (ii) Advice which of the machines is to be selected?

Financial Analysis and Planning

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

<i>Liabilities</i>	₹ (‘000)	<i>Assets</i>	₹ (‘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, 2012 and payment would be made on March 31, 2013.
- (iv) In March, 2013, a dividend of 7 per cent on equity capital would be paid.
- (v) ₹ 5,50,000, 11% Debentures would be issued on 1st April, 2012.
- (vi) ₹ 30,00,000, Equity shares would be issued on 31st March, 2013.
- (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 prepare:

- (i) The projected Balance Sheet as on 31st March, 2013.
- (ii) The projected Cash Flow Statement in accordance with AS-3.

Working Capital Management

9. You are required to prepare a cash budget based on the given information. The cash balance in hand on 1st January 2012 is ₹ 72,500. Assume that 50 per cent of total sales are cash sales. Assets are to be acquired in the months of February and April. Therefore, provisions should be made for the payment of ₹ 8,000 and ₹ 25,000 for the same. An application has been made to the bank for the grant of a loan of ₹ 30,000 and it is hoped that the loan amount will be received in the month of May.

Months	Sales (₹)	Materials Purchases (₹)	Salaries & Wages (₹)	Production Over heads (₹)	Office and Selling Over heads (₹)
January	72,000	25,000	10,000	6,000	5,500
February	97,000	31,000	12,100	6,300	6,700
March	86,000	25,500	10,600	6,000	7,500
April	88,600	30,600	25,000	6,500	8,900
May	1,02,500	37,000	22,000	8,000	11,000
June	1,08,700	38,800	23,000	8,200	11,500

It is anticipated that a dividend of ₹ 35,000 will be paid in June. Debtors are allowed one month's credit. Creditors for materials purchased and overheads grant one month's credit. Sales commission at 3 per cent on sales is paid to the sales man each month.

10. Differentiate between the following:
- Global Depository Receipts and Euro Convertible Bonds
 - Factoring and Bills Discounting
 - Business Risk and Financial Risk.

SUGGESTED ANSWERS/HINTS

- The present value decreases at a decreasing rate. Since the denominator of the present value equation increases at an increasing rate with 'n', therefore, the present values decreases at a decreasing rate.
 - The rich equity investor would be consulting the profitability ratios and ratios that provide information about risk.
 - Sales is the most important variable that directly affects the cash budget as the cash inflow is proportional to sales and cash outflow is proportional to production, which is again determined by sales.

- (d) The effect of this policy is that the sales remain unaffected while profits decrease. This policy suggests that the firm has poor collection policy. Accounts that are collectable are being written off too soon. Therefore, the turnover is being maintained at the expense of increased bad debt losses.
- (e) Trade credit and accruals as source of working capital involves implicit cost. The supplier extending trade credit incurs cost in the form of opportunity cost of funds invested in trade receivables. Generally, the supplier passes on these costs to the buyer by increasing the price of the goods or alternatively by not extending cash discount facility.

2. Statement of Estimation of Working Capital Requirements of Mahalaxmi Limited

	₹
A. Investment in Inventory	
1. Raw Material Inventory:	
One month (30)days(RMC/360) x RMCP = [(70,000 x 52/360) x 30	3,03,333.33
2. Work-in-Process Inventory:	
Half-a-Month (15 days) (COP/360) x WIPC = {70,000x110.50/360}x15	3,22,291.67
3. Finished Goods Inventory:	
One Month (30 days) (COS/360) x FGCP =[(70,000x110.5)/360] x 30	6,44,583.33
	12,70,208.33
B. Investment in Debtors:	
Two Months (60 days)	9,66,875.00
(Credit sale (cost)/360)x BDCP=[(52,500x110.5)]x60	
C. Cash Balance	1,20,000.00
D. Investment in Current Assets (A+B+C)	23,57,708.33
E. Current Liabilities: Deferred Payment	
1. Creditors: One Month (30 days)	
(Purchase of raw material/360) x PDP =[(70,000x52)/360]x30	3,03,333.33
2. Deferred Wages: 1 ½ weeks (10 days)	
= [(70,000x 19.5)/360]x10	37,916.67

3. Deferred Overheads: One Month (30 days) = $[(70,000 \times 39)/360] \times 30$	2,27,500.00
F. <i>Total Current Liabilities</i>	5,68,750.00
G. Net Working Capital (D – F)	17,88,958.33

3. (a) (i) **Payback Period**

Project A : $10,000/10,000 = 1$ year

Project B: $10,000/7,500 = 1 \frac{1}{3}$ years.

Project C: $2 \text{ years} + \frac{10,000 - 6,000}{12,000} = 2 \frac{1}{3}$ years

Project D: 1 year.

(ii) **ARR**

Project A : $\frac{(10,000 - 10,000)1/2}{(10,000)1/2} = 0$

Project B : $\frac{(15,000 - 10,000)1/2}{(10,000)1/2} = \frac{2,500}{5,000} = 50\%$

Project C: $\frac{(18,000 - 10,000)1/3}{(10,000)1/2} = \frac{2,667}{5,000} = 53\%$

Project D: $\frac{(16,000 - 10,000)1/3}{(10,000)1/2} = \frac{2,000}{5,000} = 40\%$

Note: This net cash proceed includes recovery of investment also. Therefore, net cash earnings are found by deducting initial investment.

(iii) **IRR**

Project A: The net cash proceeds in year 1 are just equal to investment. Therefore, $r = 0\%$.

Project B: This project produces an annuity of ₹ 7,500 for two years. Therefore, the required PVA factor is: $10,000/7,500 = 1.33$.

This factor is found under 32% column. Therefore, $r = 32\%$

Project C: Since cash flows are uneven, the trial and error method will be followed. Using 20% rate of discount the NPV is + ₹ 1,389. At 30% rate of discount, the NPV is -₹ 633. The true rate of return should be less than 30%. At 27% rate of discount it is

found that the NPV is -₹ 86 and at 26% +₹ 105. Through interpolation, we find $r = 26.5\%$

Project D: In this case also by using the trial and error method, it is found that at 37.6% rate of discount NPV becomes almost zero.

Therefore, $r = 37.6\%$.

(iv) **NPV**

Project A:

at 10% $-10,000 + 10,000 \times 0.909 = -910$

at 30% $-10,000 + 10,000 \times 0.769 = -2,310$

Project B:

at 10% $-10,000 + 7,500(0.909 + 0.826) = 3,013$

at 30% $-10,000 + 7,500(0.769 + 0.592) = +208$

Project C:

at 10% $-10,000 + 2,000 \times 0.909 + 4,000 \times 0.826 + 12,000 \times 0.751 = +4,134$

at 30% $-10,000 + 2,000 \times 0.769 + 4,000 \times 0.592 + 12,000 \times 0.455 = -633$

Project D:

at 10% $-10,000 + 10,000 \times 0.909 + 3,000 \times (0.826 + 0.751) = +3,821$

at 30% $-10,000 + 10,000 \times 0.769 + 3,000 \times (0.592 + 0.455) = +831$

The projects are ranked as follows according to the various methods:

Projects	Ranks				
	PB	ARR	IRR	NPV (10%)	NPV (30%)
A	1	4	4	4	4
B	2	2	2	3	2
C	3	1	3	1	3
D	1	3	1	2	1

- (b) Payback and ARR are theoretically unsound method for choosing between the investment projects. Between the two time-adjusted (DCF) investment criteria, NPV and IRR, NPV gives consistent results. If the projects are independent (and there is no capital rationing), either IRR or NPV can be used since the same set of projects will be accepted by any of the methods. In the present case, except Project A all the three projects should be accepted if the discount rate is 10%. Only Projects B and D should be undertaken if the discount rate is 30%.

4. Computation of Weighted Average Cost of Capital using Market Value Weights

Cost of Equity (k_e)

$$\begin{aligned}
 K_e &= \frac{D_1}{P_0} + g \\
 &= \frac{\text{₹ } 2}{\text{₹ } 24 - \text{₹ } 4} + 5\% \\
 &= 15\%
 \end{aligned}$$

Cost of Debt (k_d)

$$\begin{aligned}
 K_d &= \frac{I(1-T) + (RV - NP)/N}{(RV + NP)/2} \\
 &= \frac{9(1-0.35) + (100 - 98)/10}{(100 + 98)/2} \\
 &= \frac{5.85 + 0.20}{99} = 6.11\%
 \end{aligned}$$

Cost of Preference Shares (k_p)

$$\begin{aligned}
 K_p &= \frac{PD + (RV - NP)/N}{(RV + NP)/2} \\
 &= \frac{11 + (100 - 97)/10}{(100 + 97)/2} \\
 &= \frac{11.30}{98.5} = 11.47\%
 \end{aligned}$$

Calculation of WACC using Market Value Weights

Source of Capital	Market Value (₹)	Weights to Total Capital	Specific Cost	Total Cost
Debentures (₹ 105 per debenture)	2,88,750	0.1672	0.0611	0.0102
Preference Shares (₹ 106 per preference share)	2,38,500	0.1381	0.1147	0.0158
Equity Shares (₹ 24 per share)	<u>12,00,000</u>	<u>0.6947</u>	0.1500	<u>0.1042</u>
	<u>17,27,250</u>	<u>1.00</u>		<u>0.1302</u>

WACC using market value weights = 13.02%

5. Earnings per Share under the Three Financial Plans for Kalyani Steels Limited*First Financial Plan: Issue of Equity Shares only*

	₹	₹	₹	₹	₹
EBIT	10,000	20,000	40,000	60,000	1,00,000
Interest	0	0	0	0	0
PBT	10,000	20,000	40,000	60,000	1,00,000
Taxes @ 50%	5,000	10,000	20,000	30,000	50,000
PAT	5,000	10,000	20,000	30,000	50,000
No. of shares	50,000	50,000	50,000	50,000	50,000
EPS	0.10	0.20	0.40	0.60	1.00

Second Financial Plan: Issue of Equity Shares and Debentures

	₹	₹	₹	₹	₹
EBIT	10,000*	20,000	40,000	60,000	1,00,000
Interest	20,000*	20,000	20,000	20,000	20,000
PBT	(10,000)*	0	20,000	40,000	80,000
Taxes @ 50%	(5,000)*	0	10,000	20,000	40,000
PAT	(5,000)*	0	10,000	20,000	40,000
No. of shares	25,000*	25,000	25,000	25,000	25,000
EPS	(0.20)*	0.00	0.40	0.80	1.60

It is assumed that the company will be able to set off losses against other profits. If the company has no profits from other operations, losses will be carried forward.

Third Financial Plan: Issue of Equity Shares and Preference Shares

	₹	₹	₹	₹	₹
EBIT	10,000	20,000	40,000	60,000	100,000
Interest	0	0	0	0	0
PBT	10,000	20,000	40,000	60,000	100,000
Taxes @ 50%	5,000	10,000	20,000	30,000	50,000
PAT	5,000	10,000	20,000	30,000	50,000
Pref. Dividend	20,000	20,000	20,000	20,000	20,000
PAT for ordinary shareholders	(15,000)	(10,000)	0	10,000	30,000
No. of shares	25,000	25,000	25,000	25,000	25,000
EPS	(0.60)	(0.40)	0.00	0.40	1.20

Advice: The choice of the financial plan will depend on the state of economic conditions. If Kalyani Steels Limited's sales are increasing, the earnings per share will be maximum under the second financial plan. Under favourable conditions, debt financing gives more benefit than equity or preference capital because interest on debt is tax-deductible while preference dividend is not.

6. (a) Inventory Turnover

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

Since gross profit margin is 15 per cent, the cost of goods sold should be 85 per cent of the sales.

$$\text{Cost of goods sold (COGS)} = 0.85 \times ₹ 6,40,000 = ₹ 5,44,000$$

$$= \frac{₹ 5,44,000}{\text{Average inventory}}$$

$$\text{Average inventory} = \frac{₹ 5,44,000}{\text{Cost of goods sold}} = 5$$

$$\text{Average inventory} = ₹ 1,08,800$$

(b) Average Collection Period (ACP)

$$\text{ACP} = \frac{\text{Average debtors}}{\text{Credit sales}} \times 360$$

$$\text{Average debtors} = (\text{Opening Debtors} + \text{Closing Debtors})/2$$

Closing balance of debtors is found as follows:

Current Assets (2.5 of Current Liabilities)	2,40,000
Less: Inventories	48,000
Cash	16,000
	<u>64,000</u>
Debtors	<u>1,76,000</u>

$$\begin{aligned} \text{Average Debtors} &= (₹ 1,76,000 + ₹ 80,000)/2 \\ &= ₹ 1,28,000 \end{aligned}$$

$$\begin{aligned} \text{Average collection period} &= \frac{₹ 1,28,000}{₹ 6,40,000} \times 360 \\ &= 72 \text{ days.} \end{aligned}$$

7. (i) **Expenditure at year zero**

	(₹ in lakhs)	
Particulars	A	B
Cost of Machine	5.00	5.00
Cost of Utilities	1.00	2.00
Salvage of Old Machine	(1.00)	(1.00)
Salvage of Old Utilities	—	(0.20)
Total Expenditure (Net)	<u>5.00</u>	<u>5.80</u>

(ii) **Discounted Value of Cash Inflows**

		(₹ in lakhs)			
		Machine A		Machine B	
Year	NPV Factor @ 15%	Cash inflows	Discounted value of inflows	Cash inflows	Discounted value of inflows
0	1.00	(5.00)	(5.00)	(5.80)	(5.80)
1	0.87	1.00	0.87	2.00	1.74
2	0.76	1.50	1.14	2.10	1.60
3	0.66	1.80	1.19	1.80	1.19
4	0.57	2.00	1.14	1.70	0.97
5	0.50	1.70	0.85	0.40	0.20
Salvage	0.50	0.50	0.25	0.60	0.30
Net Present Value			<u>5.44</u> (+)0.44		<u>6.00</u> (+)0.20

Since the Net present Value of both the machines is positive both are acceptable.

(iii) **Discounted Payback Period**

		(₹ in lakhs)		
		Machine A		Machine B
Year	Discounted Cash inflows	Cumulative Discounted Cash inflows	Discounted Cash inflows	Cumulative Discounted Cash inflows
0	(5.00)	—	(5.80)	—
1	0.87	0.87	1.74	1.74

2	1.14	2.01	1.60	3.34
3	1.19	3.20	1.19	4.53
4	1.14	4.34	0.97	5.50
5	1.10*	5.44	0.50	6.00

* includes salvage value

Discounted Payback Period

$$4 \text{ years} + \left(\frac{(0.66)}{1.10} \right) \times 1 = 4.6 \text{ years} \quad 4 \text{ years} + \left(\frac{(0.30)}{0.50} \right) \times 1 = 4.6 \text{ years}$$

Desirability Factor Method

Profitability Index: $\frac{\text{Sum of present value of net cash inflow}}{\text{Initial cash outlay}}$

$$\frac{\text{₹ 5.44 lakhs}}{\text{₹ 5.00 lakhs}} = 1.08 \quad \frac{\text{₹ 6.00 lakhs}}{\text{₹ 5.80 lakhs}} = 1.034$$

- (iv) **Advice:** The discounted payback period in both the cases is same, also the net present value is positive in both the cases but the desirability factor (profitability index) is higher in the case of Machine A, it is therefore better to choose Machine A.

8. (i) Calculation of Sales

Fixed Assets ₹ (1,62,50,000 + 30,00,000) = 1,92,50,000

$$\text{Sales} = \frac{1,92,50,000}{1.4} = 1,37,50,000$$

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 × 0.05 = 6,87,500

Net profit = 1,37,50,000 × 0.10 = 13,75,000

Calculation of Net Fixed Assets

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

Calculation of Closing Stock

$$\begin{aligned}\text{Average stock} &= \frac{\text{Cost of goods sold}}{\text{Stock turnover ratio}} \\ &= \frac{1,23,75,000}{6} = 20,62,500\end{aligned}$$

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

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

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

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

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

Calculation of Interest and Provision for Taxation

Net Profit	13,75,000
Less: Interest (19,50,000 × 10%)	<u>2,55,500</u>
(5,50,000 × 11%)	11,19,500
Less: Taxes	<u>3,35,850</u>
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**(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)
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(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, 2013

Liabilities	₹ ('000)	Assets	₹ ('000)
Equity Share Capital	9,000	Fixed Assets (at cost)	19,250
8% Preference Share Capital	3,250	Less: Depreciation written off	5,887.5
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.

Cash Budget

	<i>Jan</i> (₹)	<i>Feb</i> (₹)	<i>March</i> (₹)	<i>April</i> (₹)	<i>May</i> (₹)	<i>June</i> (₹)	<i>Total</i> (₹)
Receipts							
Cash Sales	36,000	48,500	43,000	44,300	51,250	54,350	2,77,400
Collection from Debtors	-----	36,000	48,500	43,000	44,300	51,250	2,23,050
Bank Loan	----	-----	-----	----	30,000	----	30,000
Total	36,000	84,500	91,500	87,300	1,25,550	1,05,600	5,30,450
Payments							
Materials	---	25,000	31,000	25,500	30,600	37,000	1,49,100
Salaries and Wages	10,000	12,100	10,600	25,000	22,000	23,000	1,02,700
Production Overheads	-----	6,000	6,300	6,000	6,500	8,000	32,800
Office and Selling Overheads	-----	5,500	6,700	7,500	8,900	11,000	39,600
Sales Commission	2,160	2,190	2,580	2,658	3,075	3,261	16,644
Capital Expenditure	---	8,000	-----	25,000	----	----	33,000
Dividend	----	---	---	----	---	35,000	35,000
Total	12,160	59,510	57,180	91,658	71,075	1,17,261	4,08,844
Net Cash Flow	23,840	24,990	34,320	4,358	54,475	11,661	1,21,606
Balance in the Beginning of Month	72,500	96,340	1,21,330	1,55,650	1,51,292	2,05,767	1,94,106
Balance at the End of Month	96,340	1,21,330	1,55,650	1,51,292	2,05,767	1,94,106	3,15,712

10. (a) **Global Depository Receipts (GDR):** It is a negotiable certificate denominated in US dollars which represents a Non-US company's publically traded local currency equity shares. GDR 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 GDR 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.

Whereas, 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. These are bearer securities and generally the issue of such bonds may carry two options viz. call option and put option. In the case of ECBs, the payment of interest and the redemption of the bonds will be made by the issuer company in US dollars. ECBs issues are listed at London or Luxemburg stock exchanges.

(b) **Differentiation between Factoring and Bills Discounting**

The differences between Factoring and Bills discounting are:

- (i) Factoring is called as "Invoice Factoring" whereas Bills discounting is known as 'Invoice discounting.'
- (ii) In Factoring, the parties are known as the client, factor and debtor whereas in Bills discounting, they are known as drawer, drawee and payee.
- (iii) Factoring is a sort of management of book debts whereas bills discounting is a sort of borrowing from commercial banks.
- (iv) For factoring there is no specific Act, whereas in the case of bills discounting, the Negotiable Instruments Act is applicable.

(c) **Business Risk and Financial Risk**

Business risk refers to the risk associated with the firm's operations. It is an unavoidable risk because of the environment in which the firm has to operate and the business risk is represented by the variability of earnings before interest and tax (EBIT). The variability in turn is influenced by revenues and expenses. Revenues and expenses are affected by demand of firm's products, variations in prices and proportion of fixed cost in total cost.

Whereas, Financial risk refers to the additional risk placed on firm's shareholders as a result of debt use in financing. Companies that issue more debt instruments would have higher financial risk than companies financed mostly by equity. Financial risk can be measured by ratios such as firm's financial leverage multiplier, total debt to assets ratio etc.