

PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I: COST ACCOUNTING

QUESTIONS

Material

1. Banerjee Brothers (BB) supplies surgical gloves to nursing homes and polyclinics in the city. These surgical gloves are sold in pack of 10 pairs at price of ₹ 250 per pack.

For the month of April 2018, it has been anticipated that a demand for 60,000 packs of surgical gloves will arise. BB purchases these gloves from the manufacturer at ₹ 228 per pack within a 4 to 6 days' lead time. The ordering and related cost is ₹ 240 per order. The storage cost is 10% p.a. of average inventory investment.

Required:

- (i) Calculate the Economic Order Quantity (EOQ)
- (ii) Calculate the number of orders needed every year
- (iii) Calculate the total cost of ordering and storage of the surgical gloves.
- (iv) Determine when should the next order to be placed. (Assuming that the company does maintain a safety stock and that the present inventory level is 10,033 packs with a year of 360 working days).

Labour

2. Sonali Ltd. wants to ascertain the profit lost during the year 2017-18 due to increased labour turnover. For this purpose, it has given you the following information:

- (1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.
- (2) 20% of the output during training period was defective. Cost of rectification of a defective unit was ₹ 25.
- (3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.
- (4) Selling price per unit is ₹ 180 and P/V ratio is 20%.
- (5) Settlement cost of the workers leaving the organization was ₹ 1,83,480.
- (6) Recruitment cost was ₹ 1,56,340
- (7) Training cost was ₹ 1,13,180

You are required to calculate the profit lost by the company due to increased labour turnover during the year 2017-18.

Overheads

3. World Class Manufacturers – a small scale enterprise, produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The annual budgeted production overheads for the year 2017-18 are ₹ 44,00,000 and budgeted annual machine hours are 2,20,000.

For a period of first six months of the financial year 2017-18, following information were extracted from the books:

Actual production overheads	₹ 24,88,200
Amount included in the production overheads:	
Paid as per court's order	₹ 1,28,000
Expenses of previous year booked in current year	₹ 1,200
Paid to workers for strike period under an award	₹ 44,000
Obsolete stores written off	₹ 6,700

Production and sales data of the concern for the first six months are as under:

Production:	
Finished goods	24,000 units
Works-in-progress	
(50% complete in every respect)	18,000 units
Sale:	
Finished goods	21,600 units

The actual machine hours worked during the period were 1,16,000 hours. It is revealed from the analysis of information that $\frac{1}{4}$ of the under/ over absorption was due to defective production policies and the balance was attributable to increase/decrease in costs.

Required:

- Determine the amount of under/over absorption of production overheads for the six-month period of 2017-18.
- Show the accounting treatment of under/ over absorption of production overheads, and
- Apportion the under/ over absorbed overheads over the items.

Non-Integrated Accounts

4. As of 31st March, 2018, the following balances existed in a firm's cost ledger, which is maintained separately on a double entry basis:

	Debit (₹)	Credit (₹)
Stores Ledger Control A/c	3,20,000	—

Work-in-process Control A/c	1,52,000	—
Finished Goods Control A/c	2,56,000	—
Manufacturing Overhead Control A/c	—	28,000
Cost Ledger Control A/c	—	7,00,000
	7,28,000	7,28,000

During the next quarter, the following items arose:

	(₹)
Finished Product (at cost)	2,35,500
Manufacturing overhead incurred	91,000
Raw material purchased	1,36,000
Factory wages	48,000
Indirect labour	20,600
Cost of sales	1,68,000
Materials issued to production	1,26,000
Sales returned (at cost)	8,000
Materials returned to suppliers	11,000
Manufacturing overhead charged to production	86,000

You are required to prepare the Cost Ledger Control A/c, Stores Ledger Control A/c, Work-in-process Control A/c, Finished Stock Ledger Control A/c, Manufacturing Overhead Control A/c, Wages Control A/c, Cost of Sales A/c and the Trial Balance at the end of the quarter as per costing records.

Batch Costing

5. Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake atleast 50 units of any item at a time. A customer has given an order for 600 cakes. To process a batch, the following cost would be incurred:

Direct materials - ₹ 5,000

Direct wages - ₹ 500 (irrespective of units)

Oven set- up cost - ₹750 (irrespective of units)

AC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads.

AC requires a profit margin of 25% of sales value.

Required:

- (i) Determine the price to be charged for 600 cakes.
- (ii) Calculate cost and selling price per cake.
- (iii) What would be selling price per unit If the order is for 605 cakes.

Process Costing

6. Akash Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes and the company uses FIFO method to value work-in-process and finished goods. At the end of the last month, a fire occurred in the factory and destroyed some of paper containing records of the process operations for the month.

Akash Ltd. needs your help to prepare the process accounts for the month during which the fire occurred. You have been able to gather some information about the month's operating activities but some of the information could not be retrieved due to the damage. The following information was salvaged:

- Opening work-in-process at the beginning of the month was 800 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 26,640.
- Closing work-in-process at the end of the month was 160 litres, 30% complete for labour and 20% complete for overheads.
- Normal loss is 10% of input and total losses during the month were 1,800 litres partly due to the fire damage.
- Output sent to finished goods warehouse was 4,200 litres.
- Losses have a scrap value of ₹15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹39 for the month made up as follows:

	(₹)
Raw Material	23
Labour	7
Overheads	9
	39

Required:

- (a) Calculate the quantity (in litres) of raw material inputs during the month.
- (b) Calculate the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.

- (c) Calculate the values of raw material, labour and overheads added to the process during the month.
- (d) Prepare the process account for the month.

Joint Products & By Products

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

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

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

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

- (i) Prepare a statement showing the apportionment of joint costs to A, B and X.
- (ii) Present a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.
- (iii) Prepare a statement showing the product wise and total profit for the period.
- (iv) State with supporting calculations as to whether any or all the products should be further processed or not

Standard Costing

8. Shyamali Ltd. had prepared the following estimation for the month of April:

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	45.00	36,000
Material-B	600 kg.	30.00	18,000
Skilled labour	1,000 hours	37.50	37,500
Unskilled labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

The company has produced 1,480 kg. finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	43.00	38,700
Material-B	650 kg.	32.50	21,125
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

You are required to calculate:

- Material Cost Variance;
- Material Price Variance;
- Material Mix Variance;
- Material Yield Variance;
- Labour Cost Variance;
- Labour Efficiency Variance and
- Labour Yield Variance.

Marginal Costing

9. The following figures are available from the records of XYZ Company as at 31st March.

	2017 (₹ in lakhs)	2018 (₹ in lakhs)
Sales	200	250
Profit	30	45

Calculate:

- The P/V ratio and total fixed expenses.
- The break-even level of sales.
- Sales required to earn a profit of ₹ 70 lakhs.

Budget and Budgetary Control

10. Usha Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 36 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following information has been extracted from departmental estimates for the year ended 31st March 2018 (the budget period):

	Product M	Product N
Sales (units)	28,000	13,000

Finished goods stock increase by year-end	320	160
Post-production rejection rate (%)	4	6
Material Z usage (per completed unit, net of wastage)	5 kg	6 kg
Material Z wastage (%)	10	5

Additional information:

- Usage of raw material Z is expected to be at a constant rate over the period.
- Annual cost of holding one unit of raw material in stock is 11% of the material cost.
- The cost of placing an orders is ₹ 320 per order.
- The management of Usha Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

Required:

- (a) Prepare functional budgets for the year ended 31st March 2018 under the following headings:
 - (i) Production budget for Products M and N (in units).
 - (ii) Purchases budget for Material Z (in kgs and value).
- (b) Calculate the Economic Order Quantity for Material Z (in kgs).
- (c) If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration, calculate the maximum number of units of Product M and N that could be produced.

SUGGESTED HINTS/ANSWERS

1. (i) Calculation of Economic Order Quantity:

$$EOQ = \sqrt{\frac{2 \times A \times O}{C_i}} = \sqrt{\frac{2 \times (60,000 \text{ packs} \times 12 \text{ months}) \times ₹ 240}{₹ 228 \times 10\%}}$$

$$= 3,893.3 \text{ packs or } 3,893 \text{ packs.}$$

- (ii) Number of orders per year

$$\frac{\text{Annual requirements}}{\text{E.O.Q}} = \frac{7,20,000 \text{ packs}}{3,893 \text{ packs}} = 184.9 \text{ or } 185 \text{ orders a year}$$

(iii) Ordering and storage costs

	(₹)
Ordering costs :- 185 orders × ₹ 240	44,400.00
Storage cost :- $\frac{1}{2}$ (3,893 packs × 10% of ₹228)	<u>44,380.20</u>
Total cost of ordering & storage	<u>88,780.20</u>

(iv) Timing of next order

(a) Day's requirement served by each order.

$$\text{Number of days requirements} = \frac{\text{No. of working days}}{\text{No. of order in a year}} = \frac{360 \text{ days}}{185 \text{ orders}} = 1.94 \text{ days}$$

supply.

This implies that each order of 3,893 packs supplies for requirements of 1.94 days only.

(b) Days requirement covered by inventory

$$= \frac{\text{Units in inventory}}{\text{Economic order quantity}} \times (\text{Day's requirement served by an order})$$

$$\therefore \frac{10,033 \text{ packs}}{3,893 \text{ packs}} \times 1.94 \text{ days} = 5 \text{ days requirement}$$

(c) Time interval for placing next order

Inventory left for day's requirement – Average lead time of delivery

$$5 \text{ days} - 5 \text{ days} = 0 \text{ days}$$

This means that next order for the replenishment of supplies has to be placed immediately.

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

$$\therefore \text{Output by new recruits} = 60\% \text{ of } 5,000 = 3,000 \text{ units}$$

$$\text{Loss of output} = 5,000 - 3,000 = 2,000 \text{ units}$$

$$\begin{aligned} \text{Total loss of output} &= \text{Due to delay recruitment} + \text{Due to inexperience} \\ &= 10,000 + 2,000 = 12,000 \text{ units} \end{aligned}$$

$$\text{Contribution per unit} = 20\% \text{ of } ₹180 = ₹ 36$$

$$\text{Total contribution lost} = ₹36 \times 12,000 \text{ units} = ₹ 4,32,000$$

$$\text{Cost of repairing defective units} = 3,000 \text{ units} \times 0.2 \times ₹ 25 = ₹ 15,000$$

Profit forgone due to labour turnover

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2017-18	9,00,000

3. (i) Amount of under/ over absorption of production overheads during the period of first six months of the year 2017-2018:

	Amount (₹)	Amount (₹)
Total production overheads actually incurred during the period		24,88,200
Less: Amount paid to worker as per court order	1,28,000	
Expenses of previous year booked in the current year	1,200	
Wages paid for the strike period under an award	44,000	
Obsolete stores written off	6,700	(1,79,900)
		23,08,300
Less: Production overheads absorbed as per machine hour rate (1,16,000 hours × ₹20*)		23,20,000
Amount of over absorbed production overheads		11,700

$$\text{*Budgeted Machine hour rate (Blanket rate)} = \frac{\text{₹44,00,000}}{2,20,000 \text{ hours}} = \text{₹ 20 per hour}$$

- (ii) **Accounting treatment of over absorbed production overheads:** As, one fourth of the over absorbed overheads were due to defective production policies, this being abnormal, hence should be transferred to Costing Profit and Loss Account.

$$\text{Amount to be transferred to Costing Profit and Loss Account} = (11,700 \times \frac{1}{4}) \text{ ₹ } 2,925$$

Balance of over absorbed production overheads should be distributed over Works in progress, finished goods and Cost of sales by applying supplementary rate*.

$$\text{Amount to be distributed} = (11,700 \times \frac{3}{4}) \text{ ₹ } 8,775$$

$$\text{Supplementary rate} = \frac{\text{₹ } 8,775}{33,000 \text{ units}} = \text{₹ } 0.2659 \text{ per unit}$$

- (iii) Apportionment of under absorbed production overheads over WIP, Finished goods and Cost of sales:

	Equivalent completed units	Amount (₹)
Work-in-Progress (18,000 units × 50% × ₹ 0.2659)	9,000	2,393
Finished goods (2,400 units × ₹ 0.2659)	2,400	638

Cost of sales (21,600 units × ₹ 0.2659)	21,600	5,744
Total	33,000	8,775

4.

Cost Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Store Ledger Control A/c	11,000	By Opening Balance	7,00,000
To Balance c/d	9,84,600	By Store ledger control A/c	1,36,000
		By Manufacturing Overhead Control A/c	91,000
		By Wages Control A/c	68,600
	9,95,600		9,95,600

Stores Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Opening Balance	3,20,000	By WIP Control A/c	1,26,000
To Cost ledger control A/c	1,36,000	By Cost ledger control A/c (Returns)	11,000
		By Balance c/d	3,19,000
	4,56,000		4,56,000

WIP Control Account

Particulars	(₹)	Particulars	(₹)
To Opening Balance	1,52,000	By Finished Stock Ledger Control A/c	2,35,500
To Wages Control A/c	48,000	By Balance c/d	1,76,500
To Stores Ledger Control A/c	1,26,000		
To Manufacturing Overhead Control A/c	86,000		
	4,12,000		4,12,000

Finished Stock Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Opening Balance	2,56,000	By Cost of Sales	1,68,000
To WIP Control A/c	2,35,500	By Balance c/d	3,31,500
To Cost of Sales A/c (Sales Return)	8,000		
	4,99,500		4,99,500

Manufacturing Overhead Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	91,000	By Opening Balance	28,000
To Wages Control A/c	20,600	By WIP Control A/c	86,000
To Over recovery c/d	2,400		
	1,14,000		1,14,000

Wages Control Account

Particulars	(₹)	Particulars	(₹)
To Transfer to Cost Ledger Control A/c	68,600	By WIP Control A/c	48,000
		By Manufacturing Overhead Control A/c	20,600
	68,600		68,600

Cost of Sales Account

Particulars	(₹)	Particulars	(₹)
To Finished Stock Ledger Control A/c	1,68,000	By Finished Stock Ledger Control A/c (Sales return)	8,000
		By Balance c/d	1,60,000
	1,68,000		1,68,000

Trial Balance

	(₹)	(₹)
Stores Ledger Control A/c	3,19,000	
WIP Control A/c	1,76,500	
Finished Stock Ledger Control A/c	3,31,500	
Manufacturing Overhead Control A/c	--	2,400
Cost of Sales A/c	1,60,000	
Cost ledger control A/c	--	9,84,600
	9,87,000	9,87,000

5. Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

	Particulars	Cost per batch (₹)	Total Cost (₹)
	Direct Material Cost	5,000.00	60,000
	Direct Wages	500.00	6,000
	Oven set-up cost	750.00	9,000
	Add: Production Overheads (20% of Direct wages)	100.00	1,200
	Total Production cost	6,350.00	76,200
	Add: S&D and Administration overheads (10% of Total production cost)	635.00	7,620
	Total Cost	6,985.00	83,820
	Add: Profit (1/3 rd of total cost)	2,328.33	27,940
(i)	Sales price	9,313.33	1,11,760
	No. of units in batch	50 units	
(ii)	Cost per unit (₹6,985 ÷ 50 units)	139.70	
	Selling price per unit (9,313.33 ÷ 50 units)	186.27	

(iii) If the order is for 605 cakes, then selling price per cake would be as below:

Particulars	Total Cost (₹)
Direct Material Cost	60,500
Direct Wages (₹500 × 13 batches)	6,500
Oven set-up cost (₹750 × 13 batches)	9,750
Add: Production Overheads (20% of Direct wages)	1,300
Total Production cost	78,050
Add: S&D and Administration overheads (10% of Total production cost)	7,805
Total Cost	85,855
Add: Profit (1/3 rd of total cost)	28,618
Sales price	1,14,473
No. of units	605 units
Selling price per unit (₹ 1,14,473 ÷ 605 units)	189.21

6. (a) Calculation of Raw Material inputs during the month:

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	800	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,360	Process Losses	1,800
		Closing WIP	160
	6,160		6,160

(b) Calculation of Normal Loss and Abnormal Loss/Gain

	Litres
Total process losses for month	1,800
Normal Loss (10% input)	536
Abnormal Loss (balancing figure)	1,264

(c) Calculation of values of Raw Material, Labour and Overheads added to the process:

	Material	Labour	Overheads
Cost per equivalent unit	₹23.00	₹7.00	₹9.00
Equivalent units (litre) (refer the working note)	4,824	4,952	5,016
Cost of equivalent units	₹1,10,952	₹34,664	₹45,144
Add: Scrap value of normal loss (536 units × ₹ 15)	₹8,040	--	--
Total value added	₹1,18,992	₹34,664	₹45,144

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	800	Units completed:							
Units introduced	5,360	- Opening WIP	800	--	--	240	30	320	40

		- Fresh inputs	3,400	3,400	100	3,400	100	3,400	100
		Normal loss	536	--	--	--	--	--	--
		Abnormal loss	1,264	1,264	100	1,264	100	1,264	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,824		4,952		5,016	

(d) **Process Account for Month**

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	800	26,640	By Finished goods	4,200	1,63,800
To Raw Materials	5,360	1,18,992	By Normal loss	536	8,040
To Wages	--	34,664	By Abnormal loss	1,264	49,296
To Overheads	--	45,144	By Closing WIP	160	4,304
	6,160	2,25,440		6,160	2,25,440

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

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

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

Products	A	B	X
Joint costs apportioned (₹) : (I)	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000
Joint cost per kg (₹): (I ÷ II)	35	28	7
Further processing Cost per kg. (₹)	10	15	2

	$\left(\frac{₹ 1,80,000}{18,000 \text{ kg}} \right)$	$\left(\frac{₹ 1,50,000}{10,000 \text{ kg}} \right)$	$\left(\frac{₹ 1,08,000}{54,000 \text{ kg}} \right)$
Total cost per kg (₹)	45	43	9

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

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

Working Notes

1.

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

2. Valuation of closing stock:

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

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

(iv) Calculations for processing decision

Products	A	B	X
Selling price per kg at the point of split off (₹)	50	40	10
Selling price per kg after further processing (₹) (Refer to working Note 1)	72	50	18
Incremental selling price per kg (₹)	22	10	8
Less: Further processing cost per kg (₹)	(10)	(15)	(2)
Incremental profit (loss) per kg (₹)	12	(5)	6

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

8. Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	45.00	42,300	886 kg.	39,870	900 kg.	40,500	43.00	38,700
B	705 kg.	30.00	21,150	664 kg.	19,920	650 kg.	19,500	32.50	21,125
	1645 kg		63,450	1550 kg	59,790	1550 kg	60,000		59,825

WN-1: Standard Quantity (SQ):

$$\text{Material A- } \left(\frac{800 \text{ kg.}}{0.9 \times 1,400 \text{ kg.}} \times 1,480 \text{ kg.} \right) = 939.68 \text{ or } 940 \text{ kg.}$$

$$\text{Material B- } \left(\frac{600 \text{ kg.}}{0.9 \times 1,400 \text{ kg.}} \times 1,480 \text{ kg.} \right) = 704.76 \text{ or } 705 \text{ kg.}$$

WN- 2: Revised Standard Quantity (RSQ):

$$\text{Material A- } \left(\frac{800 \text{ kg.}}{1,400 \text{ kg.}} \times 1,550 \text{ kg.} \right) = 885.71 \text{ or } 886 \text{ kg.}$$

$$\text{Material B- } \left(\frac{600 \text{ kg.}}{1,400 \text{ kg.}} \times 1,550 \text{ kg.} \right) = 664.28 \text{ or } 664 \text{ kg.}$$

$$\begin{aligned} \text{(a) Material Cost Variance (A + B)} &= \{(SQ \times SP) - (AQ \times AP)\} \\ &= \{63,450 - 59,825\} = 3,625 \text{ (F)} \end{aligned}$$

$$\begin{aligned} \text{(b) Material Price Variance (A + B)} &= \{(AQ \times SP) - (AQ \times AP)\} \\ &= \{60,000 - 59,825\} = 175 \text{ (F)} \end{aligned}$$

- (c) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
 = {59,790 – 60,000} = 210 (A)
- (d) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
 = {63,450 – 59,790} = 3,660 (F)

Labour Variances:

Labour	SH (WN-3)	SR (₹)	SH × SR (₹)	RSH (WN-4)	RSH × SR (₹)	AH	AH × SR (₹)	AR (₹)	AH × AR (₹)
Skilled	1,116 hrs	37.50	41,850	1144	42,900	1,200	45,000	35.50	42,600
Unskilled	893 hrs	22.00	19,646	916	20,152	860	18,920	23.00	19,780
	2,009 hrs		61,496	2,060	63,052	2,060	63,920		62,380

WN- 3: Standard Hours (SH):

$$\text{Skilled labour-} \left(\frac{0.95 \times 1,000 \text{ hr.}}{0.90 \times 1,400 \text{ kg.}} \times 1,480 \text{ kg.} \right) = 1,115.87 \text{ or } 1,116 \text{ hrs.}$$

$$\text{Unskilled labour-} \left(\frac{0.95 \times 800 \text{ hr.}}{0.90 \times 1,400 \text{ kg.}} \times 1,480 \text{ kg.} \right) = 892.69 \text{ or } 893 \text{ hrs.}$$

WN- 4: Revised Standard Hours (RSH):

$$\text{Skilled labour-} \left(\frac{1,000 \text{ hr.}}{1,800 \text{ hr.}} \times 2,060 \text{ hr.} \right) = 1,144.44 \text{ or } 1,144 \text{ hrs.}$$

$$\text{Unskilled labour-} \left(\frac{800 \text{ hr.}}{1,800 \text{ hr.}} \times 2,060 \text{ hr.} \right) = 915.56 \text{ or } 916 \text{ hrs.}$$

- (e) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
 = {61,496 – 62,380} = 884 (A)
- (f) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
 = {61,496 – 63,920} = 2,424 (A)
- (g) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}
 = {61,496 – 63,052} = 1,556 (A)

9. (i) Profit-Volume (P/V) Ratio:

$$= \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100 = \frac{\text{Profit in 2018} - \text{Profit in 2017}}{\text{Sales in 2018} - \text{Sales in 2017}} \times 100$$

$$= \frac{\text{₹ 45 lakhs} - \text{₹ 30 lakhs}}{\text{₹ 250 lakhs} - \text{₹ 200 lakhs}} \times 100 = 30\%$$

Fixed Expenses:

	2017 (₹ in lakhs)	OR	2018 (₹ in lakhs)
Contribution	60 (30% of 200)		75 (30% of 250)
Less: Profit	30		45
Fixed Expenses	30		30

(ii) Break-even level of sales:

$$= \frac{\text{Fixed Expenses}}{\text{P/V ratio}} = \frac{\text{₹ 30 lakh}}{30\%} = \text{₹ 100 lakhs}$$

(iii) Sales required to earn a profit of ₹ 70 lakhs:

$$= \frac{\text{Fixed Expenses} + \text{Desired profit}}{\text{P/V ratio}}$$

$$= \frac{\text{₹ 30 lakhs} + \text{₹ 70 lakhs}}{30\%} = \text{₹ 333.33 lakhs}$$

10. (a) (i) Production Budget (in units) for the year ended 31st March 2018

	Product M	Product N
Budgeted sales (units)	28,000	13,000
Add: Increase in closing stock	320	160
No. good units to be produced	28,320	13,160
Post production rejection rate	4%	6%
No. of units to be produced	29,500 $\left(\frac{28,320}{0.96} \right)$	14,000 $\left(\frac{13,160}{0.94} \right)$

(ii) Purchase budget (in kgs and value) for Material Z

	Product M	Product N
No. of units to be produced	29,500	14,000
Usage of Material Z per unit of production	5 kg.	6 kg.
Material needed for production	1,47,500 kg.	84,000 kg.

Materials to be purchased	1,63,889 kg. $\left(\frac{1,47,500}{0.90} \right)$	88,421 kg. $\left(\frac{84,000}{0.95} \right)$
Total quantity to be purchased	2,52,310 kg.	
Rate per kg. of Material Z	₹ 36	
Total purchase price	₹ 90,83,160	

(b) Calculation of Economic Order Quantity for Material Z

$$EOQ = \sqrt{\frac{2 \times 2,52,310 \text{ kg.} \times ₹ 320}{₹ 36 \times 11\%}} = \sqrt{\frac{16,14,78,400}{₹ 3.96}} = 6,385.72 \text{ kg.}$$

- (c) Since, the maximum number of order per year cannot be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of Material Z that can be available for production:

$$= 4,000 \text{ kg.} \times 40 \text{ orders} = 1,60,000 \text{ kg.}$$

	Product M	Product N
Material needed for production to maintain the same production mix	1,03,929 kg. $\left(1,60,000 \times \frac{1,63,889}{2,52,310} \right)$	56,071 kg. $\left(1,60,000 \times \frac{88,421}{2,52,310} \right)$
Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for production	93,536 kg.	53,267 kg.
Units to be produced	18,707 units $\left(\frac{93,536 \text{ kg.}}{5 \text{ kg.}} \right)$	8,878 units $\left(\frac{53,267 \text{ kg.}}{6 \text{ kg.}} \right)$

PAPER 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT**PART II: FINANCIAL MANAGEMENT****QUESTIONS****Time Value of Money**

1. You need a sum of ₹ 1,00,000 at the end of 10 years. You know that the best you can do is to deposit some lump sum amount today at 6% rate of interest or to make equal payments into a bank account, starting a year from now on which you can earn 6% interest. Find out
- What amount to be deposited today or
 - What amount must be deposited annually?
- (Compound value factor and compound value factor of annuity of Re. 1 for 10 year @ 6% is 1.791 and 13.181 respectively)

Ratio Analysis

2. Based on the following particulars List out various assets and liabilities and prepare a Balance sheet of Tirupati Ltd.

Fixed assets turnover ratio	8 times
Capital turnover ratio	2 times
Inventory Turnover	8 times
Receivable turnover	4 times
Payable turnover	6 times
GP Ratio	25%

Gross profit during the year amounts to ₹ 8,00,000. There is no long-term loan or overdraft. Reserve and surplus amount to ₹ 2,00,000. Ending inventory of the year is ₹ 20,000 above the beginning inventory.

Fund Flow Analysis

3. Balance Sheets of RST Limited as on March 31, 20X8 and March 31, 20X9 are as under:

Liabilities	31.3.20X8 (₹)	31.3.20X9 (₹)	Assets	31.3.20X8 (₹)	31.3.20X9 (₹)
Equity Share Capital (10 face value per share)	10,00,000	12,00,000	Land & Building	6,00,000	7,00,000
General Reserve	3,50,000	2,00,000	Plant & Machinery	9,00,000	11,00,000

9% Preference Share Capital	3,00,000	5,00,000	Investments (Long-term)	2,50,000	2,50,000
Share Premium A/c	25,000	4,000	Stock	3,60,000	3,50,000
Profit & Loss A/c	2,00,000	3,00,000	Debtors	3,00,000	3,90,000
8% Debentures	3,00,000	1,00,000	Cash & Bank	1,00,000	95,000
Creditors	2,05,000	3,00,000	Prepaid Expenses	15,000	20,000
Bills Payable	45,000	81,000	Advance Tax Payment	80,000	1,05,000
Provision for Tax	70,000	1,00,000	Preliminary Expenses	40,000	35,000
Proposed Dividend	1,50,000	2,60,000			
	26,45,000	30,45,000		26,45,000	30,45,000

Additional information:

- (i) Depreciation charged on building and plant and machinery during the year 20X8-X9 were ₹ 50,000 and ₹ 1,20,000 respectively.
- (ii) During the year an old machine costing ₹ 1,50,000 was sold for ₹ 32,000. Its written down value was ₹ 40,000 on date of sale.
- (iii) During the year, income tax for the year 20X7-X8 was assessed at ₹76,000. A cheque of ₹ 4,000 was received along with the assessment order towards refund of income tax paid in excess, by way of advance tax in earlier years.
- (iv) Proposed dividend for 20X7-X8 was paid during the year 20X8-X9.
- (v) 9% Preference shares of ₹ 3,00,000, which were due for redemption, were redeemed during the year 20X8-X9 at a premium of 5%, out of the proceeds of fresh issue of 9% Preference shares.
- (vi) Bonus shares were issued to the existing equity shareholders at the rate of one share for every five shares held on 31.3.20X8 out of general reserves.
- (vii) Debentures were redeemed at the beginning of the year at a premium of 3%.
- (viii) Interim dividend paid during the year 20X8-X9 was ₹ 50,000.

Required:

- (a) Schedule of Changes in Working Capital; and
- (b) Fund Flow Statement for the year ended March 31, 20X9.

Cost of Capital

4. Navya Limited wishes to raise additional capital of ₹10 lakhs for meeting its modernisation plans. It has ₹ 3,00,000 in the form of retained earnings available for investments purposes. The following are the further details:

Debt/equity mix	40%/60%
Cost of debt (before tax)	
Upto ₹ 1,80,000	10%
Beyond ₹ 1,80,000	16%
Earnings per share	₹ 4
Dividend pay out	₹ 2
Expected growth rate in dividend	10%
Current market price per share	₹ 44
Tax rate	50%

You are required:

- To ascertain the pattern for raising the additional finance.
- To calculate the post-tax average cost of additional debt.
- To calculate the cost of retained earnings and cost of equity, and
- Find out the overall weighted average cost of capital (after tax).

Capital Structure Decisions

5. Company P and Q are identical in all respects including risk factors except for debt/equity, company P having issued 10% debentures of ₹ 18 lakhs while company Q is unlevered. Both the companies earn 20% before interest and taxes on their total assets of ₹ 30 lakhs.

Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company. Calculate the value of companies P and Q using (i) Net Income Approach and (ii) Net Operating Income Approach.

Leverage

6. Calculate the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B:

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	₹ 30 per unit
Variable Cost	₹ 15 per unit

Fixed Cost:

Under Situation I	₹15,000
Under Situation-II	₹20,000

Capital Structure:

	Financial Plan	
	A (₹)	B (₹)
Equity	10,000	15,000
Debt (Rate of Interest at 20%)	10,000	5,000
	20,000	20,000

Capital Budgeting

7. A company has to make a choice between two projects namely A and B. The initial capital outlay of two Projects are ₹1,35,000 and ₹2,40,000 respectively for A and B. There will be no scrap value at the end of the life of both the projects. The opportunity Cost of Capital of the company is 16%. The annual incomes are as under:

Year	Project A	Project B	Discounting factor @ 16%
1	--	60,000	0.862
2	30,000	84,000	0.743
3	1,32,000	96,000	0.641
4	84,000	1,02,000	0.552
5	84,000	90,000	0.476

You are required to calculate for each project:

- Discounted payback period
- Profitability index
- Net present value

Management of Payables (Creditors)

8. A Ltd. is in the manufacturing business and it acquires raw material from X Ltd. on a regular basis. As per the terms of agreement the payment must be made within 40 days of purchase. However, A Ltd. has a choice of paying ₹ 98.50 per ₹ 100 it owes to X Ltd. on or before 10th day of purchase. Examine Whether A Ltd. should accept the offer of discount assuming average billing of A Ltd. with X Ltd. is ₹ 10,00,000 and an alternative investment yield a return of 15% and company pays the invoice.

Financing of Working Capital

9. Following information is forecasted by the Puja Limited for the year ending 31st March, 20X8:

	Balance as at 1 st April, 20×7 (₹)	Balance as at 31 st March, 20×8 (₹)
Raw Material	45,000	65,356
Work-in-progress	35,000	51,300
Finished goods	60,181	70,175
Debtors	1,12,123	1,35,000
Creditors	50,079	70,469
Annual purchases of raw material (all credit)		4,00,000
Annual cost of production		7,50,000
Annual cost of goods sold		9,15,000
Annual operating cost		9,50,000
Annual sales (all credit)		11,00,000

You may take one year as equal to 365 days.

You are required to calculate:

- Net operating cycle period.
- Number of operating cycles in the year.
- Amount of working capital requirement using operating cycles.

10. Miscellaneous

- "The profit maximization is not an operationally feasible criterion". Discuss
- Explain the followings:
 - Bridge Finance
 - Floating Rate Bonds
 - Packing Credit.
- "Financial Leverage is a double edged sword" Discuss

SUGGESTED ANSWERS/HINTS

$$1. \quad (i) \quad PV = \frac{FV}{(1+k)^n} \quad \text{or, } PV = \frac{₹1,00,000}{(1+0.06)^{10}}$$

$$= ₹ 55,839.48$$

$$(ii) \quad FVA(k,n) = A \left[\frac{(1+k)^n - 1}{k} \right]$$

$$A = \frac{FVA(k,n)}{\left[\frac{(1+k)^n - 1}{k} \right]} = \frac{₹1,00,000}{13.181} = ₹ 7,586.68$$

$$2. \quad (a) \quad G.P. \text{ ratio} = \frac{\text{Gross Profit}}{\text{Sales}} = 25\%$$

$$\text{Sales} = \frac{\text{Gross Profit}}{25} \times 100 = \frac{₹ 8,00,000}{25} \times 100 = ₹ 32,00,000$$

$$(b) \quad \begin{aligned} \text{Cost of Sales} &= \text{Sales} - \text{Gross profit} \\ &= ₹ 32,00,000 - ₹ 8,00,000 \\ &= ₹ 24,00,000 \end{aligned}$$

$$(c) \quad \begin{aligned} \text{Receivable turnover} &= \frac{\text{Sales}}{\text{Receivables}} = 4 \\ &= \text{Receivables} = \frac{\text{Sales}}{4} = \frac{₹ 32,00,000}{4} = ₹ 8,00,000 \end{aligned}$$

$$(d) \quad \begin{aligned} \text{Fixed assets turnover} &= \frac{\text{Cost of Sales}}{\text{Fixed Assets}} = 8 \\ \text{Fixed assets} &= \frac{\text{Cost of Sales}}{8} = \frac{₹ 24,00,000}{8} = ₹ 3,00,000 \end{aligned}$$

$$(e) \quad \begin{aligned} \text{Inventory turnover} &= \frac{\text{Cost of Sales}}{\text{Average Stock}} = 8 \\ \text{Average Stock} &= \frac{\text{Cost of Sales}}{8} = \frac{₹ 24,00,000}{8} = ₹ 3,00,000 \end{aligned}$$

$$\begin{aligned}
 \text{Average Stock} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\
 \text{Average Stock} &= \frac{\text{Opening Stock} + \text{Opening Stock} + 20,000}{2} \\
 \text{Average Stock} &= \text{Opening Stock} + ₹ 10,000 \\
 \text{Opening Stock} &= \text{Average Stock} - ₹ 10,000 \\
 &= ₹ 3,00,000 - ₹ 10,000 \\
 &= ₹ 2,90,000 \\
 \text{Closing Stock} &= \text{Opening Stock} + ₹ 20,000 \\
 &= ₹ 2,90,000 + ₹ 20,000 \\
 &= ₹ 3,10,000 \\
 \text{(f) Payable turnover} &= \frac{\text{Purchase}}{\text{Creditors}} = 6 \\
 \text{Purchases} &= \text{Cost of Sales} + \text{Increase in Stock} \\
 &= ₹ 24,00,000 + ₹ 20,000 \\
 &= ₹ 24,20,000 \\
 \text{Payables} &= \frac{\text{Purchase}}{6} = \frac{₹ 24,20,000}{6} = ₹ 4,03,333 \\
 \text{(g) Capital turnover} &= \frac{\text{Cost of Sales}}{\text{Capital Employed}} = 2 \\
 \text{Capital Employed} &= \frac{\text{Cost of Sales}}{2} = \frac{₹ 24,00,000}{2} = ₹ 12,00,000 \\
 \text{(h) Share Capital} &= \text{Capital Employed} - \text{Reserves \& Surplus} \\
 &= ₹ 12,00,000 - ₹ 2,00,000 = ₹ 10,00,000
 \end{aligned}$$

Balance Sheet of Tirupati Ltd as on

Liabilities	Amount (₹)	Assets	Amount (₹)
Share Capital	10,00,000	Fixed Assets	3,00,000
Reserve & Surplus	2,00,000	Closing Inventories	3,10,000
Payables	4,03,333	Receivables	8,00,000

		Other Current Assets	1,93,333
	16,03,333		16,03,333

(Fixed Asset turnover, inventory turnover capital turnover is calculated on cost of sales)

3. (a) **Schedule of Changes in Working Capital**

Particulars	31st March		Working Capital	
	20X8 (₹)	20X9 (₹)	Increase (₹)	Decrease (₹)
A. Current Assets:				
Stock	3,60,000	3,50,000	--	10,000
Sundry Debtors	3,00,000	3,90,000	90,000	--
Prepaid expenses	15,000	20,000	5,000	--
Cash and Bank	1,00,000	95,000	--	5,000
Total (A)	7,75,000	8,55,000		
B. Current Liabilities:				
Sundry Creditors	2,05,000	3,00,000	--	95,000
Bills Payables	45,000	81,000	--	36,000
Total (B)	2,50,000	3,81,000		
Working Capital (A – B)	5,25,000	4,74,000		
Decrease in Working Capital		51,000	51,000	
Total	5,25,000	5,25,000	1,46,000	1,46,000

(b) **Funds Flow Statement for the year ending 31st March, 20X9**

	(₹)
A. Sources of Funds:	
(i) Fund from Business Operations	7,49,000
(ii) Proceeds from issue of 9% Preference shares	5,00,000
(iii) Proceeds from sale of Plant & Machinery	32,000
(iv) Income tax refund	4,000
Total sources	12,85,000
B. Application of Funds:	
(i) Purchase of Land and Building	1,50,000

(ii) Purchase of Plant and Machinery	3,60,000
(iii) Redemption of 8% Debentures	2,06,000
(iv) Redemption of 9% Preference shares	3,15,000
(v) Payment of income tax assessed	1,05,000
(vi) Payment of Interim dividend	50,000
(vii) Payment of dividend	1,50,000
Total uses	13,36,000
Net Decrease in Working Capital (A – B)	51,000

Working Notes:**(1) Computation of Funds from Business Operation**

	(₹)
Profit & Loss as on March 31, 20X9	3,00,000
Add: Depreciation on Land and Building	50,000
Depreciation on Plant and Machinery	1,20,000
Loss on sale of Plant and Machinery	8,000
Preliminary expenses written off	5,000
Transfer to General Reserve	50,000
Proposed dividend	2,60,000
Provision for tax	1,06,000
Interim dividend paid	50,000
	9,49,000
Less: Profit and loss as on March 31, 20X8	2,00,000
Fund from Operations	7,49,000

(2) Plant & Machinery A/c

	(₹)		(₹)
To Balance b/d	9,00,000	By Depreciation	1,20,000
To Bank [Purchase (Bal. Fig.)]	3,60,000	By Bank (Sale)	32,000
		By P/L A/c (Loss on Sale)	8,000
		By Balance c/d	11,00,000
	12,60,000		12,60,000

(3) Land and Building A/c

	(₹)		(₹)
To Balance b/d	6,00,000	By Depreciation	50,000
To Bank (Purchase) (Bal. Fig.)	1,50,000	By Balance c/d	7,00,000
	7,50,000		7,50,000

(4) Advance Tax Payment A/c

	(₹)		(₹)
To Balance b/d	80,000	By Provision for taxation A/c	76,000
To Bank (paid for 08-09)	1,05,000	By Bank (Refund of tax)	4,000
		By Balance c/d	1,05,000
	1,85,000		1,85,000

(5) Provision for Taxation A/c

	(₹)		(₹)
To Advance tax payment A/c	76,000	By Balance b/d	70,000
To Balance c/d	1,00,000	By P/L A/c (additional provision for 20X7-X8)	6,000
		By P/L A/c (Provision for X8-X9)	1,00,000
	1,76,000		1,76,000

(6) 8% Debentures A/c

	(₹)		(₹)
To Bank (2,00,000 x 103%) (redemption)	2,06,000	By Balance b/d	3,00,000
To Balance c/d	1,00,000	By Premium on redemption of Debentures A/c	6,000
	3,06,000		3,06,000

(7) 9% Preference Share Capital A/c

	(₹)		(₹)
To Bank A/c (redemption) (3,00,000 x 105%)	3,15,000	By Balance b/d	3,00,000
To Balance c/d	5,00,000	By Premium on redemption	15,000

		of Preference shares A/c	
		By Bank (Issue)	5,00,000
	8,15,000		8,15,000

(8) Securities Premium A/c

	(₹)		(₹)
To Premium on redemption of debentures A/c	6,000	By Balance b/d	25,000
To Premium on redemption of preference shares A/c	15,000		
To Balance c/d	4,000		
	25,000		25,000

(9) General Reserve A/c

	(₹)		(₹)
To Bonus to Shareholders A/c	2,00,000	By Balance b/d	3,50,000
To Balance c/d	2,00,000	By P/L A/c (transfer)	50,000
	4,00,000		4,00,000

Provision for tax and Advance tax may be taken as current liability and current assets respectively.

4. (a) Pattern of Raising Additional Finance

Equity = $10,00,000 \times 60/100 = ₹ 6,00,000$

Debt = $10,00,000 \times 40/100 = ₹ 4,00,000$

Capital structure after Raising Additional Finance

Sources of fund	Amount (₹)
Shareholder's funds	
Equity capital (6,00,000 – 3,00,000)	3,00,000
Retained earnings	3,00,000
Debt at 10% p.a.	1,80,000
Debt at 16% p.a. (4,00,000 – 1,80,000)	2,20,000
Total funds	10,00,000

(b) Post-tax Average Cost of Additional Debt

$K_d = I(1 - t)$, where ' K_d ' is cost of debt, ' I ' is interest and ' t ' is tax rate.

On ₹ 1,80,000 = 10% (1 - 0.5) = 5% or 0.05

On ₹ 2,20,000 = 16% (1 - 0.5) = 8% or 0.08

Average Cost of Debt (Post tax) i.e.

$$K_d = \frac{1,80,000 \times 0.05 + 2,20,000 \times 0.08}{4,00,000} \times 100 = 6.65\% \text{ (approx)}$$

(c) Cost of Retained Earnings and Cost of Equity applying Dividend Growth Model

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

$$\text{Then, } K_e = \frac{2 \frac{1.1}{44}}{44} + 0.10 = \frac{2.2}{44} + 0.10 = 0.15 \text{ or } 15\%$$

(d) Overall Weighted Average Cost of Capital (WACC) (After Tax)

Particulars	Amount (₹)	Weights	Cost of Capital	WACC
Equity (including retained earnings)	6,00,000	0.60	15%	9.00
Debt	4,00,000	0.40	6.65%	2.66
Total	10,00,000	1.00		11.66

5. (i) Valuation under Net Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Earnings before Interest & Tax (EBIT) (20% of ₹ 30,00,000)	6,00,000	6,00,000
Less: Interest (10% of ₹ 18,00,000)	1,80,000	
Earnings before Tax (EBT)	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings after Tax (EAT) (available to equity holders)	2,10,000	3,00,000
Value of equity (capitalized @ 15%)	14,00,000 (2,10,000 × 100/15)	20,00,000 (3,00,000 × 100/15)

Add: Total Value of debt	18,00,000	Nil
Total Value of Company	32,00,000	20,00,000

(ii) Valuation of Companies under Net Operating Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Capitalisation of earnings at 15% $\left(\frac{₹6,00,000(1-0.5)}{0.15} \right)$	20,00,000	20,00,000
Less: Value of debt {18,00,000 (1 – 0.5)}	9,00,000	Nil
Value of equity	11,00,000	20,00,000
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	29,00,000	20,00,000

6. (i) Operating leverages:

Particulars	Situation-I (₹)	Situation-II (₹)
Sales (S) (3,000 units @ ₹ 30/- per unit)	90,000	90,000
Less: Variable Cost (VC) @ ₹15 per unit	<u>(45,000)</u>	<u>(45,000)</u>
Contribution (C)	45,000	45,000
Less: Fixed Cost (FC)	<u>15,000</u>	<u>20,000</u>
EBIT	<u>30,000</u>	<u>25,000</u>
Operating Leverage $\left(\frac{C}{EBIT} \right)$	$\frac{45,000}{30,000}$	$\frac{45,000}{25,000}$
	= 1.5	= 1.8

(ii) Financial Leverages:

	A (₹)	B (₹)
Situation I:		
EBIT	30,000	30,000
Less: Interest on debt	<u>(2,000)</u>	<u>(1,000)</u>

EBT	28,000	29,000
Financial Leverage $\left(\frac{\text{EBIT}}{\text{EBT}} \right)$	$\frac{30,000}{28,000}$	$\frac{30,000}{29,000}$
	= 1.07	= 1.03
Situation-II:		
EBIT	25,000	25,000
Less: Interest on debt	(2,000)	(1,000)
EBT	23,000	24,000
Financial Leverage $\left(\frac{\text{EBIT}}{\text{EBT}} \right)$	$\frac{25,000}{23,000}$	$\frac{25,000}{24,000}$
	= 1.09	= 1.04

(iii) Combined Leverages:

	A (₹)	B (₹)
(a) Situation I	$1.5 \times 1.07 = 1.61$	$1.5 \times 1.03 = 1.55$
(b) Situation II	$1.8 \times 1.09 = 1.96$	$1.8 \times 1.04 = 1.87$

7. Working notes

1 Computation of Net Present Values of Projects

Year	Cash flows		Disc. factor @ 16 %	Discounted Cash flow	
	Project A (₹)	Project B (₹)		Project A (₹)	Project B (₹)
	(1)	(2)	(3)	(3) × (1)	(3) × (2)
0	(1,35,000)	(2,40,000)	1.000	(1,35,000)	(2,40,000)
1	--	60,000	0.862	--	51,720
2	30,000	84,000	0.743	22,290	62,412
3	1,32,000	96,000	0.641	84,612	61,536
4	84,000	1,02,000	0.552	46,368	56,304
5	84,000	90,000	0.476	39,984	42,840
Net present value				58,254	34,812

2. Computation of Cumulative Present Values of Projects Cash inflows

Year	Project A		Project B	
	PV of cash inflows (₹)	Cumulative PV (₹)	PV of cash inflows (₹)	Cumulative PV (₹)
1	--	--	51,720	51,720
2	22,290	22,290	62,412	1,14,132
3	84,612	1,06,902	61,536	1,75,668
4	46,368	1,53,270	56,304	2,31,972
5	39,984	1,93,254	42,840	2,74,812

(i) Discounted payback period: (Refer to Working note 2)

Cost of Project A = ₹1,35,000

Cost of Project B = ₹ 2,40,000

Cumulative PV of cash inflows of Project A after 4 years = ₹ 1,53,270

Cumulative PV of cash inflows of Project B after 5 years = ₹ 2,74,812

A comparison of projects cost with their cumulative PV clearly shows that the project A's cost will be recovered in less than 4 years and that of project B in less than 5 years. The exact duration of discounted payback period can be computed as follows:

	Project A	Project B
Excess PV of cash inflows over the project cost (₹)	18,270 (₹1,53,270 – ₹ 1,35,000)	34,812 (₹ 2,74,812 – ₹2,40,000)
Computation of period required to recover excess amount of cumulative PV over project cost (Refer to Working note 2)	0.39 year (₹ 18,270 ÷ ₹ 46,368)	0.81 years (₹34,812 ÷ ₹ 42,840)
Discounted payback period	3.61 year (4 – 0.39) years	4.19 years (5 – 0.81) years

$$(ii) \text{ Profitability Index: } = \frac{\text{Sum of discounted cash inflows}}{\text{Initian cash outlay}}$$

$$\text{Profitability Index (for Project A)} = \frac{₹1,93,254}{₹1,35,000} = 1.43$$

$$\text{Profitability Index (for Project B)} = \frac{₹2,74,812}{₹2,40,000} = 1.15$$

(iii) **Net present value** (for Project A) = ₹ 58,254 (Refer to Working note 1)

Net present value (for Project B) = ₹ 34,812

8. Annual Benefit of accepting the Discount

$$\frac{₹1.5}{₹100-₹1.50} \times \frac{365 \text{ days}}{40-10 \text{ days}} = 18.53\%$$

Annual Cost = Opportunity Cost of foregoing interest on investment = 15%

If average invoice amount is ₹ 10,00,000

	If discount is	
	Accepted	Not Accepted
Payment to Supplier	9,85,000	10,00,000
Return on investment of ₹ 9,85,00 for 30 days { ₹ 9,85,000 × (30/365) × 15% }		(12,144)
	9,85,500	9,87,856

Thus, from above table it can be seen that it is cheaper to accept the discount.

9. Working Notes:

1. Raw Material Storage Period (R)

$$= \frac{\text{Average Stock of Raw Material}}{\text{Annual Consumption of Raw Material}} \times 365$$

$$= \frac{₹ 45,000 + ₹ 65,356}{2} \times 365$$

$$= \frac{₹ 3,79,644}{2} \times 365$$

$$= 53 \text{ days.}$$

Annual Consumption of Raw Material = Opening Stock + Purchases - Closing Stock

$$= ₹ 45,000 + ₹ 4,00,000 - ₹ 65,356$$

$$= ₹ 3,79,644$$

2. **Work-in-Progress (WIP) Conversion Period (W)**

$$\begin{aligned} \text{WIP Conversion Period} &= \frac{\text{Average Stock of WIP}}{\text{Annual Cost of Production}} \times 365 \\ &= \frac{\frac{\text{₹ } 35,000 + \text{₹ } 51,300}{2}}{\text{₹ } 7,50,000} \times 365 = 21 \text{ days} \end{aligned}$$

3. **Finished Stock Storage Period (F)**

$$\begin{aligned} &= \frac{\text{Average Stock of Finished Goods}}{\text{Cost of Goods Sold}} \times 365 \\ &= \frac{\text{₹ } 65,178}{\text{₹ } 9,15,000} \times 365 = 26 \text{ days.} \end{aligned}$$

$$\text{Average Stock} = \frac{\text{₹ } 60,181 + \text{₹ } 70,175}{2} = \text{₹ } 65,178.$$

4. **Debtors Collection Period (D)**

$$\begin{aligned} &= \frac{\text{Average Debtors}}{\text{Annual Credit Sales}} \times 365 \\ &= \frac{\text{₹ } 1,23,561.50}{\text{₹ } 11,00,000} \times 365 = 41 \text{ days} \end{aligned}$$

$$\text{Average debtors} = \frac{\text{₹ } 1,12,123 + \text{₹ } 1,35,000}{2} = \text{₹ } 1,23,561.50$$

5. **Creditors Payment Period (C)**

$$\begin{aligned} &= \frac{\text{Average Creditors}}{\text{Annual Net Credit Purchases}} \times 365 \\ &= \frac{\left(\frac{\text{₹ } 50,079 + \text{₹ } 70,469}{2} \right)}{\text{₹ } 4,00,000} \times 365 = 55 \text{ days} \end{aligned}$$

(i) **Operating Cycle Period**

$$\begin{aligned} &= R + W + F + D - C \\ &= 53 + 21 + 26 + 41 - 55 \\ &= 86 \text{ days} \end{aligned}$$

(ii) Number of Operating Cycles in the Year

$$= \frac{365}{\text{Operating Cycle Period}} = \frac{365}{86} = 4.244$$

(iii) Amount of Working Capital Required

$$= \frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycles}} = \frac{\text{₹ 9,50,000}}{4.244} = \text{₹ 2, 23,845.42}$$

- 10 (a) "The profit maximisation is not an operationally feasible criterion." This statement is true because Profit maximisation can be a short-term objective for any organisation and cannot be its sole objective. Profit maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:
- (i) **Vague term:** The definition of the term profit is ambiguous. Does it mean short term or long term profit? Does it refer to profit before or after tax? Total profit or profit per share?
 - (ii) **Timing of Return:** The profit maximization objective does not make distinction between returns received in different time periods. It gives no consideration to the time value of money, and values benefits received today and benefits received after a period as the same.
 - (iii) It ignores the risk factor.
 - (iv) The term maximization is also vague
- (b) (i) **Bridge Finance:** Bridge finance refers, normally, to loans taken by the business, usually from commercial banks for a short period, pending disbursement of term loans by financial institutions. Normally it takes time for the financial institution to finalise procedures of creation of security, tie-up participation with other institutions etc. even though a positive appraisal of the project has been made. However, once the loans are approved in principle, firms in order not to lose further time in starting their projects arrange for bridge finance. Such temporary loan is normally repaid out of the proceeds of the principal term loans. It is secured by hypothecation of moveable assets, personal guarantees and demand promissory notes. Generally rate of interest on bridge finance is higher as compared with that on term loans.
- (ii) **Floating Rate Bonds:** These are the bonds where the interest rate is not fixed and is allowed to float depending upon the market conditions. These are ideal instruments which can be resorted to by the issuers to hedge themselves against the volatility in the interest rates. They have become more popular as a money market instrument and have been successfully issued by financial

institutions like IDBI, ICICI etc.

- (iii) **Packing Credit:** Packing credit is an advance made available by banks to an exporter. Any exporter, having at hand a firm export order placed with him by his foreign buyer on an irrevocable letter of credit opened in his favour, can approach a bank for availing of packing credit. An advance so taken by an exporter is required to be liquidated within 180 days from the date of its commencement by negotiation of export bills or receipt of export proceeds in an approved manner. Thus Packing Credit is essentially a short-term advance.
- (c) On one hand when cost of 'fixed cost fund' is less than the return on investment financial leverage will help to increase return on equity and EPS. The firm will also benefit from the saving of tax on interest on debts etc. However, when cost of debt will be more than the return it will affect return of equity and EPS unfavourably and as a result firm can be under financial distress. This is why financial leverage is known as "double edged sword".

Effect on EPS and ROE:

When, $ROI > \text{Interest}$ – Favourable – Advantage

When, $ROI < \text{Interest}$ – Unfavourable – Disadvantage

When, $ROI = \text{Interest}$ – Neutral – Neither advantage nor disadvantage.