

PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I: COST ACCOUNTING

QUESTIONS

Material

1. Ananya Ltd. produces a product 'Exe' using a raw material Dee. To produce one unit of Exe, 2 kg of Dee is required. As per the sales forecast conducted by the company, it will be able to sell 10,000 units of Exe in the coming year. The following is the information regarding the raw material Dee:

- (i) The Re-order quantity is 200 kg. less than the Economic Order Quantity (EOQ).
- (ii) Maximum consumption per day is 20 kg. more than the average consumption per day.
- (iii) There is an opening stock of 1,000 kg.
- (iv) Time required to get the raw materials from the suppliers is 4 to 8 days.
- (v) The purchase price is ₹125 per kg.

There is an opening stock of 900 units of the finished product Exe.

The rate of interest charged by bank on Cash Credit facility is 13.76%.

To place an order company has to incur ₹ 720 on paper and documentation work.

From the above information find out the followings in relation to raw material Dee:

- (a) Re-order Quantity
- (b) Maximum Stock level
- (c) Minimum Stock level
- (d) Calculate the impact on the profitability of the company by not ordering the EOQ.

[Take 364 days for a year]

Labour

2. A Company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three workers. Which are under consideration of the management.

	I	II	III
Actual hours worked	380	100	540
Hourly rate of wages (in ₹)	40	50	60
Productions in units:			
- Product A	210	-	600
- Product B	360	-	1350

- Product C	460	250	-
Standard time allowed per unit of each product is:			
	A	B	C
Minutes	15	20	30

For the purpose of piece rate, each minute is valued at ₹ 1/-

You are required to calculate the wages of each worker under:

- Guaranteed hourly rate basis
- Piece work earning basis, but guaranteed at 75% of basic pay (Guaranteed hourly rate if his earnings are less than 50% of basic pay.)
- Premium bonus basis where the worker received bonus based on Rowan scheme.

Overheads

- The Unibion Ltd. has the following account balances and distribution of direct charges on 31st March, 2019.

	Total	Production Depts.		Service Depts.	
		Machine Shop	Packing	General Plant	Stores
Allocated Overheads:	(₹)	(₹)	(₹)	(₹)	(₹)
Indirect labour	29,000	8,000	6,000	4,000	11,000
Maintenance Material	9,900	3,400	1,600	2,100	2,800
Misc. supplies	5,900	1,500	2,900	900	600
Supervisor's salary	16,000	--	--	16,000	--
Cost & payroll salary	80,000	--	--	80,000	--

Overheads to be apportioned:

Power	78,000
Rent	72,000
Fuel and Heat	60,000
Insurance	12,000
Taxes	8,400
Depreciation	1,20,000

The following data were compiled by means of the factory survey made in the previous year:

	Floor Space	Radiator Section	No. of employees	Investment	H.P. hours
Machine Shop	2,000 Sq. ft.	45	20	8,00,000	3,500

Packing	800 Sq. ft.	90	12	2,40,000	500
General Plant	400 Sq. ft.	30	4	80,000	-
Stores & maintenance	1,600 Sq. ft.	60	8	1,60,000	1,000

Expenses charged to the stores departments are to be distributed to the other departments by the following percentages:

Machine shop 50%; Packing 20%; General Plant 30%;

General Plant overheads is distributed on the basis of number of employees.

- Prepare an overhead distribution statement with supporting schedules to show computations and basis of distribution.
- Determine the service department distribution by simultaneous equation method.

Non-integrated Accounting

- The following is the summarised Trading and Profit and Loss Account of XYZ Ltd. for the year ended 31st March 2019:

Particulars	Amount (₹)	Particulars	Amount (₹)
Direct Material	14,16,000	Sales (30,000 units)	30,00,000
Direct wages	7,42,000	Finished stock (2,000 units)	1,67,500
Works overheads	4,26,000	Work-in-progress:	
Administration overheads	1,50,000	- Materials 34,000	
Selling and distribution overheads	1,65,000	- Wages 16,000	
Net profit for the year	3,22,500	- Works overhead <u>4,000</u>	54,000
	32,21,500		32,21,500

The company's cost records show that in course of manufacturing a standard unit (i) works overheads have been charged @ 20% on prime cost, (ii) administration overheads are related with production activities and are recovered at ₹5 per finished unit, and (iii) selling and distribution overheads are recovered at ₹6 per unit sold.

You are required to prepare:

- Costing Profit and Loss Account indicating the net profits,
- A Statement showing reconciliation between profit as disclosed by the Cost Accounts and Financial Accounts.

Contract Costing

5. Dream house (P) Ltd. is engaged in building two residential housing projects in the city. Particulars related to two housing projects are as below:

	HP-1 (₹)	HP-2 (₹)
Work in Progress on 1 st April 2018	7,80,000	2,80,000
Materials Purchased	6,20,000	8,10,000
Land purchased near to the site to open an office	-	12,00,000
Brokerage and registration fee paid on the above purchase	-	60,000
Wages paid	85,000	62,000
Wages outstanding as on 31 st March, 2019	12,000	8,400
Donation paid to local clubs	5,000	2,500
Plant hire charges paid for three years effecting from 1 st April 2018	72,000	57,000
Value of materials at site as on 31 st March, 2019	47,000	52,000
Contract price of the projects	48,00,000	36,00,000
Value of work certified	20,50,000	16,10,000
Work not certified	1,90,000	1,40,000

A concrete mixture machine was bought on 1st April 2018 for ₹8,20,000 and used for 180 days in HP-1 and for 100 days in HP-2. Depreciation is provided @ 15% p.a. (this machine can be used for any other projects)

As per the contract agreement contractee shall retain 20% of work certified as retention money.

Prepare contract account for the two housing projects showing the profit or loss on each project for the year ended 31st March, 2019.

Operating Costing

6. P Ltd. distributes its goods to dealers using a delivery van. The dealers' premises are 40 kilometre away from the company's office. The van has a capacity of 10 tonnes and makes the journey twice a day fully loaded on the outward journeys and empty on return journey. The following information is available for a four weekly period during the year 20X9:

Diesel consumption	10 kilometre per litre
Diesel cost	₹48 per litre
Lubricant oil	₹600 per week
Drivers salary	₹12,000 per month

Repairs & Maintenance	₹1,800 per month
Garage rent	₹4,800 per months
Cost of van (excluding tyres)	₹16,00,000
Life of van	3,80,000 kilometres
Insurance	₹5,400 per annum
Cost of tyres	₹22,000
Life of tyres	80,000 kilometres
Estimated sale value of van at end of its life	₹2,40,000
Vehicle permit fee	₹3,600 per annum
Other overhead cost	₹66,000 per annum

The van operates five-day a week.

Required:

- (i) A statement to show the total monthly cost of operating the vehicle.
- (ii) Calculate the operating cost per kilometre and per tonne kilometre

Process Costing

7. Following information is available regarding process A for the month of February, 20X9:

Production Record:

Units in process as on 01.02.20X9	4,000
(All materials used, 25% complete for labour and overhead)	
New units introduced	16,000
Units completed	14,000
Units in process as on 28.02.20X9	6,000
(All materials used, 33-1/3% complete for labour and overhead)	

Cost Records:

Work-in-process as on 01.02.20X9	(₹)
Materials	6,00,000
Labour	1,00,000
Overhead	<u>1,00,000</u>
	<u>8,00,000</u>
Cost during the month	
Materials	25,60,000

Labour	15,00,000
Overhead	<u>15,00,000</u>
	<u>55,60,000</u>

Presuming that average method of inventory is used, prepare:

- Statement of Equivalent Production.
- Statement showing Cost for each element.
- Statement of Apportionment of cost.
- Process Cost Account for Process A.

Joint Product and By Product

8. 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:

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

Standard Costing

9. XYZ Ltd. produces a product X by using two raw materials A and B. The following standards have been set for the production:

Material	Standard Mix	Standard Price (₹)
A	40%	40 per kg.
B	60%	30 per kg.

The standard loss in processing is 15%.

During July, 2018 the company produced 2,000 kg. of finished output.

The positions of stock and purchases for the month of July, 2018 are as under:

Material	Stock on 1 st July 2018	Stock on 31 st July 2018	Purchases during July 2018	
			Quantity	Amount (₹)
A	40 kg.	10 kg.	900 kg.	42.50
B	50 kg.	60 kg.	1,400 kg.	25.00

Calculate the following variances:

- (i) Material Price Variance; (ii) Material Usage Variance;
- (iii) Material Mix Variance; (iv) Material Yield Variance;
- (v) Total Material Cost Variance.

The company follows FIFO method of stock valuation.

Marginal Costing

10. MNP Ltd sold 2,75,000 units of its product at ₹ 375 per unit. Variable costs are ₹ 175 per unit (manufacturing costs of ₹140 and selling cost ₹ 35 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹ 3,50,00,000 (including depreciation of ₹ 1,50,00,000). there are no beginning or ending inventories.

Required:

- (i) Compute breakeven sales level quantity and cash breakeven sales level quantity.
- (ii) Compute the P/V ratio.
- (iii) Compute the number of units that must be sold to earn an income (EBIT) of ₹ 25,00,000.
- (iv) Compute the sales level achieve an after-tax income (PAT) of ₹ 25,00,000. Assume 40% corporate Income Tax rate.

Budget and Budgetary Control

11. Aditya Ltd. manufactures two products K and H. The sales director has anticipated to sale 8,000 units of Product K and 4,200 units of Product H. The Standard cost data for the products for next year are as follows:

	Product- K Per unit	Product- H Per unit
Direct materials:		
- Material X @ ₹ 15 per kg.	12 kg.	15 kg.
- Material Y @ ₹ 16 per kg.	15 kg.	6 kg.

- Material Z @ ₹ 5 per ltr.	8 ltr.	14 ltr.
Direct wages:		
- Unskilled @ ₹ 40 per hour	12 hour	10 hour
- Skilled @ ₹ 75 per hour	8 hour	5 hour

Budgeted stocks for next year are as follows:

		Product- K (Units)	Product- H (Units)
1 st April, 2018		800	1,600
31 st March, 2019		1,000	2,100
	Material-X (kg)	Material-Y (kg)	Material-Z (ltr)
1 st April, 2018	25,000	30,000	14,000
31 st March, 2019	30,000	18,000	7,500

Prepare the following budgets for next year:

- Production budget, in units;
- Material purchase budget, in quantity and in value;
- Direct labour budget, in hours and in value.

Miscellaneous

- Distinguish between Cost Control and Cost Reduction.
 - Discuss the accounting treatment of Idle time and overtime wages.
 - Discuss cost classification based on variability and controllability.

SUGGESTED HINTS/ANSWERS

1. Working Notes:

- Computation of Annual consumption & Annual Demand for raw material 'Dee':

Sales forecast of the product 'Exe'	10,000 units
Less: Opening stock of 'Exe'	900 units
Fresh units of 'Exe' to be produced	9,100 units
Raw material required to produce 9,100 units of 'Exe' (9,100 units × 2 kg.)	18,200 kg.
Less: Opening Stock of 'Dee'	1,000 kg.
Annual demand for raw material 'Dee'	17,200 kg.

(ii) Computation of Economic Order Quantity (EOQ):

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2 \times \text{Annual demand of 'Dee'} \times \text{Ordering cost}}{\text{Carrying cost per unit per annum}}} \\ &= \sqrt{\frac{2 \times 17,200 \text{ kg.} \times ₹ 720}{₹ 125 \times 13.76\%}} = \sqrt{\frac{2 \times 17,200 \text{ kg.} \times ₹ 720}{₹ 17.2}} = 1,200 \text{ kg.} \end{aligned}$$

(iii) Re- Order level:

$$\begin{aligned} &= (\text{Maximum consumption per day} \times \text{Maximum lead time}) \\ &= \left\{ \left(\frac{\text{Annual Consumption of 'Dee'}}{364 \text{ days}} + 20 \text{ kg.} \right) \times 8 \text{ days} \right\} \\ &= \left\{ \left(\frac{18,200 \text{ kg.}}{364 \text{ days}} + 20 \text{ kg.} \right) \times 8 \text{ days} \right\} = 560 \text{ kg.} \end{aligned}$$

(iv) Minimum consumption per day of raw material 'Dee':

Average Consumption per day = 50 Kg.

Hence, Maximum Consumption per day = 50 kg. + 20 kg. = 70 kg.

So Minimum consumption per day will be

$$\text{Average Consumption} = \frac{\text{Min.consumption} + \text{Max.consumption}}{2}$$

$$\text{Or, } 50 \text{ kg.} = \frac{\text{Min.consumption} + 70 \text{ kg.}}{2}$$

$$\text{Or, Min. consumption} = 100 \text{ kg} - 70 \text{ kg.} = 30 \text{ kg.}$$

(a) Re-order Quantity :

$$\text{EOQ} - 200 \text{ kg.} = 1,200 \text{ kg.} - 200 \text{ kg.} = 1,000 \text{ kg.}$$

(b) Maximum Stock level:

= Re-order level + Re-order Quantity – (Min. consumption per day × Min. lead time)

$$= 560 \text{ kg.} + 1,000 \text{ kg.} - (30 \text{ kg.} \times 4 \text{ days})$$

$$= 1,560 \text{ kg.} - 120 \text{ kg.} = 1,440 \text{ kg.}$$

(c) Minimum Stock level:

= Re-order level – (Average consumption per day × Average lead time)

$$= 560 \text{ kg.} - (50 \text{ kg.} \times 6 \text{ days}) = 260 \text{ kg.}$$

(d) Impact on the profitability of the company by not ordering the EOQ.

		When purchasing the ROQ	When purchasing the EOQ
I	Order quantity	1,000 kg.	1,200 kg.
II	No. of orders a year	$\frac{17,200\text{kg.}}{1,000\text{kg.}} = 17.2$ or 18 orders	$\frac{17,200\text{kg.}}{1,200\text{kg.}} = 14.33$ or 15 orders
III	Ordering Cost	18 orders $\times$ ₹ 720 = ₹ 12,960	15 orders $\times$ ₹ 720 = ₹ 10,800
IV	Average Inventory	$\frac{1,000\text{kg.}}{2} = 500\text{kg.}$	$\frac{1,200\text{kg.}}{2} = 600\text{kg.}$
V	Carrying Cost	500 kg. $\times$ ₹ 17.2 = ₹ 8,600	600 kg. $\times$ ₹ 17.2 = ₹ 10,320
VI	Total Cost	₹ 21,560	₹ 21,120

Extra Cost incurred due to not ordering EOQ = ₹ 21,560 - ₹ 21,120 = ₹ 440

2. (i) Computation of wages of each worker under guaranteed hourly rate basis

Worker	Actual hours worked (Hours)	Hourly wage rate (₹)	Wages (₹)
I	380	40	15,200
II	100	50	5,000
III	540	60	32,400

(ii) Computation of Wages of each worker under piece work earning basis

Product	Piece rate per unit (₹)	Worker-I		Worker-II		Worker-III	
		Units	Wages (₹)	Units	Wages (₹)	Units	Wages (₹)
A	15	210	3,150	-	-	600	9,000
B	20	360	7,200	-	-	1,350	27,000
C	30	460	13,800	250	7,500	-	-
Total			24,150		7,500		36,000

Since each worker's earnings are more than 50% of basic pay. Therefore, worker-I, II and III will be paid the wages as computed i.e. ₹ 24,150, ₹ 7,500 and ₹ 36,000 respectively.

Working Notes:**1. Piece rate per unit**

Product	Standard time per unit in minute	Piece rate each minute (₹)	Piece rate per unit (₹)
A	15	1	15
B	20	1	20
C	30	1	30

2. Time allowed to each worker

Worker	Product-A	Product-B	Product-C	Total Time (H ours)
I	210 units × 15 = 3,150	360 units × 20 = 7,200	460 units × 30 = 13,800	24,150/60 = 402.50
II	-	-	250 units × 30 = 7,500	7,500/60 = 125
III	600 units × 15 = 9,000	1,350 units × 20 = 27,000	-	36,000/60 = 600

(iii) Computation of wages of each worker under Premium bonus basis (where each worker receives bonus based on Rowan Scheme)

Worker	Time Allowed (Hr.)	Time Taken (Hr.)	Time saved (Hr.)	Wage Rate per hour (₹)	Earnings (₹)	Bonus (₹)*	Total Earning (₹)
I	402.5	380	22.5	40	15,200	850	16,050
II	125	100	25	50	5,000	1,000	6,000
III	600	540	60	60	32,400	3,240	35,640

$$* \frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Wage Rate}$$

$$\text{Worker-I} = \frac{380}{402.5} \times 22.5 \times 40 = 850$$

$$\text{Worker-II} = \frac{100}{125} \times 25 \times 50 = 1,000$$

$$\text{Worker-III} = \frac{540}{600} \times 60 \times 60 = 3,240$$

3. (a) Overhead Distribution Statement

	Production Departments		Service Departments	
	Machine Shops	Packing	General Plant	Stores
Allocated Overheads:	(₹)	(₹)	(₹)	(₹)
Indirect labour	8,000	6,000	4,000	11,000
Maintenance Material	3,400	1,600	2,100	2,800
Misc. supplies	1,500	2,900	900	600
Supervisor's salary	--	--	16,000	--
Cost & payroll salary	--	--	80,000	--
Total allocated overheads	12,900	10,500	1,03,000	14,400
Add: Apportioned Overheads (As per Schedule below)	1,84,350	70,125	22,775	73,150
	1,97,250	80,625	1,25,775	87,550

Schedule of Apportionment of Overheads

Item of Cost	Basis	Production Departments		Service Departments	
		Machine Shops (₹)	Packing (₹)	General Plant (₹)	Stores (₹)
Power	HP hours (7 : 1 : - : 2)	54,600	7,800	--	15,600
Rent	Floor space (5 : 2 : 1 : 4)	30,000	12,000	6,000	24,000
Fuel & Heat	Radiator sec. (3 : 6 : 2 : 4)	12,000	24,000	8,000	16,000
Insurance	Investment (10 : 3 : 1 : 2)	7,500	2,250	750	1,500
Taxes	Investment (10 : 3 : 1 : 2)	5,250	1,575	525	1,050
Depreciation	Investment (10 : 3 : 1 : 2)	75,000	22,500	7,500	15,000
		1,84,350	70,125	22,775	73,150

(b) Re-distribution of Overheads of Service Departments to Production Departments:

Let, the total overheads of General Plant = 'a' and the total overheads of Stores = 'b'

$$a = 1,25,775 + 0.3b \dots\dots\dots(i)$$

$$b = 87,550 + 0.2a \dots\dots\dots(ii)$$

Putting the value of 'b' in equation no. (i)

$$a = 1,25,775 + 0.3 (87,550 + 0.2a)$$

$$\text{Or } a = 1,25,775 + 26,265 + 0.06a$$

$$\text{Or } 0.94a = 1,52,040 \quad \text{Or } a = 1,61,745 \text{ (appx.)}$$

Putting the value of a = 1,61,745 in equation no. (ii) to get the value of 'b'

$$b = 87,550 + 0.2 \times 1,61,745 = 1,19,899$$

Secondary Distribution Summary

Particulars	Total (₹)	Machine Shops (₹)	Packing (₹)
Allocated and Apportioned overheads as per Primary distribution	2,77,875	1,97,250.00	80,625.00
-General Plant	1,61,745	80,872.50 $(1,61,745 \times \frac{5}{10})$	48,523.50 $(1,61,745 \times \frac{3}{10})$
-Stores	1,19,899	59,949.50 $(1,19,899 \times 50\%)$	23,979.80 $(1,19,899 \times 20\%)$
		3,38,072.00	1,53,128.30

4. (i) Costing Profit and Loss Account for the year ended 31st March 2019:

Particulars	Amount (₹)	Particulars	Amount (₹)
Material consumed	14,16,000	Sales (30,000 units)	30,00,000
Direct wages	7,42,000		
Prime Cost	21,58,000		
Works overheads (20% of Prime cost)	4,31,600		
	25,89,600		
Less: Work in progress	(54,000)		
Factory cost	25,35,600		

Administration overheads (₹5 × 32,000 units)	1,60,000		
Cost of production	26,95,600		
Less: Finished stock	(1,68,475)		
Cost of goods sold	25,27,125		
Selling and distribution overheads (₹6 × 30,000 unit)	1,80,000		
Cost of sales	27,07,125		
Profit (balancing figure)	2,92,875		
	30,00,000		30,00,000

- (ii) Statement reconciling the profit as per costing profit and loss account with the profit as per financial accounts

Particulars	Amount (₹)	Amount (₹)
Profit as per cost records		2,92,875
Add: Overheads over-absorbed:		
- Works overheads (₹ 4,31,600 – ₹ 4,26,000)	5,600	
- Administration OH (₹ 1,60,000 – ₹ 1,50,000)	10,000	
- Selling and Distribution (₹ 1,80,000 – ₹ 1,65,000)	15,000	30,600
Less: Closing stock overvalued (₹ 1,68,475 – ₹ 1,67,500)		(975)
Profit as per financial accounts		3,22,500

*It is assumed that the number of units Produced

= Number of units sold + Finished stock = 30,000 + 2,000 = 32,000 units.

5. Dr. **Contract Account for the year ended 31st March, 2019** Cr.

Particulars	HP-1 (₹)	HP-2 (₹)	Particulars	HP-1 (₹)	HP-2 (₹)
To Balance b/d: W-I-P	7,80,000	2,80,000	By Closing material at site	47,000	52,000
To Material purchased	6,20,000	8,10,000	By W-I-P:		
To Wages: (₹85,000+₹12,000) (₹62,000+₹8,400)	97,000	70,400	Value of work certified	20,50,000	16,10,000
			Cost of work not certified	1,90,000	1,40,000
To Donation to local club*	5,000	2,500			

To Plant hire charges: (₹72,000x1/3) (₹57,000x1/3)	24,000	19,000			
To Depreciation on concrete mixture**: (₹8,20,000x15%x180/365) (₹8,20,000x15%x100/365)	60,658	33,699			
To Notional profit (balance c/d)	7,00,342	5,86,401			
	22,87,000	18,02,000		22,87,000	18,02,000
To Costing P & L A/c (WN-2)	1,86,758	1,56,374	By Notional profit (balance b/d)	7,00,342	5,86,401
To Costing P & L Reserve A/c.	5,13,584	4,30,027			
	7,00,342	5,86,401		7,00,342	5,86,401

* Assuming donation paid to local club was exclusively for the above projects, hence included in the contract account.

** Depreciation on concrete mixture machine is charged on the basis of number of days used for the projects, as it is clearly mentioned in the question that this machine can be used for other projects also.

Working Notes:

- 1 Computation of Stage of completion of the projects:

$$\frac{\text{Value of work certified}}{\text{Value of contract}} \times 100$$

$$\text{HP} - 1 = \frac{\text{₹ } 20,50,000}{\text{₹ } 48,00,000} \times 100 = 42.71\%$$

$$\text{HP} - 2 = \frac{\text{₹ } 16,10,000}{\text{₹ } 36,00,000} \times 100 = 44.72\%$$

- 2 Computation of profit to be recognized in the Costing profit & loss A/c.

$$\frac{1}{3} \times \text{Notional profit} \times \frac{\text{Cash Received}}{\text{Value of work certified}}$$

$$\text{HP} - 1 = \frac{1}{3} \times \text{₹ } 7,00,342 \times 80\% = \text{₹ } 1,86,758$$

$$\text{HP-2} = \frac{1}{3} \times ₹ 5,86,401 \times 80\% = ₹1,56,374$$

(Land purchased and brokerage and registration fee paid for this purpose cannot be charged to contract account, hence not included in the contract account)

6. (i) Workings:

- (a) Distance travelled in a month = 40 k.m. × 2 × 2 trips × 5 days × 4 weeks
= 3,200 k.m.
- (b) Total Tonne-km. = 10 tonnes × 40 k.m. × 2 trips × 5 days × 4 weeks
= 16,000 tonne-k.m.
- (c) Consumption of diesel = 3,200 k.m. ÷ 10 k.m = 320 litre.
- (d) Tyre cost = ₹22,000 ÷ 80,000 k.m. × 3,200 k.m = ₹880
- (e) Depreciation of van = $\frac{₹16,00,000 - ₹2,40,000}{3,80,000 \text{ k.m.}} \times 3,200 \text{ k.m.} = ₹11,453$

Monthly Operating Cost Statement

Particulars	Amount (₹)
Running costs:	
- Cost of diesel (320 ltr × ₹48)	15,360
- Lubricant oil (₹600 × 4 weeks)	2,400
- Repairs & Maintenance	1,800
- Cost of tyres	880
- Depreciation	11,453
Total Running cost (A)	31,893
Fixed Costs:	
- Driver's salary	12,000
- Garage rent	4,800
- Insurance (₹5,400 ÷ 12)	450
- Permit fee (₹3,600 ÷ 12)	300
- Other overheads (₹66,000 ÷ 12)	5,500
Total fixed cost (B)	23,050
Total cost {(A) + (B)}	54,943

(ii) Operating Cost per kilometre = $\frac{₹54,943}{3,200 \text{ km.}} = ₹17.17$

$$\text{Cost per tonne-km} = \frac{\text{₹}54,943}{16,000 \text{ tonne-km}} = \text{₹}3.43$$

7. (i) **Statement of Equivalent Production (Average cost method)**

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)*	Units**	(%)*	Units**	(%)*	Units**
20,000	Completed	14,000	100	14,000	100	14,000	100	14,000
	WIP	6,000	100	6,000	33-1/3	2,000	33-1/3	2,000
20,000		20,000		20,000		16,000		16,000

*Percentage of completion

** Equivalent units

(ii) **Statement showing Cost for each element**

Particulars	Materials	Labour	Overhead	Total
Cost of opening work-in-progress (₹)	6,00,000	1,00,000	1,00,000	8,00,000
Cost incurred during the month (₹)	25,60,000	15,00,000	15,00,000	55,60,000
Total cost (₹) : (A)	31,60,000	16,00,000	16,00,000	63,60,000
Equivalent units : (B)	20,000	16,000	16,000	
Cost per equivalent unit (₹) : C = (A ÷ B)	158	100	100	358

(iii) **Statement of Apportionment of cost**

	(₹)	(₹)
Value of output transferred: (A) (14,000 units × ₹ 358)		50,12,000
Value of closing work-in-progress: (B)		
Material (6,000 units × ₹158)	9,48,000	
Labour (2,000 units × ₹ 100)	2,00,000	
Overhead (2,000 units × ₹ 100)	2,00,000	13,48,000
Total cost : (A + B)		63,60,000

(iv) **Process- A Account**

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening WIP	4,000	8,00,000	By Completed units	14,000	50,12,000

To Materials	16,000	25,60,000	By Closing WIP	6,000	13,48,000
To Labour		15,00,000			
To Overhead		15,00,000			
	20,000	63,60,000		20,000	63,60,000

8. (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 $\left(\frac{₹ 1,80,000}{18,000 \text{ kg}} \right)$	15 $\left(\frac{₹ 1,50,000}{10,000 \text{ kg}} \right)$	2 $\left(\frac{₹ 1,08,000}{54,000 \text{ kg}} \right)$
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.

9. Workings:

1. Calculation of Actual Materials Consumed:

Particulars	Material A (kg.)	Material B (kg.)
Opening stock	40	50
Add: Purchases	900	1,400
Less: Closing Stock	(10)	(60)
Material Consumed	930	1,390

(i) Material Price Variance:

$$\text{Actual Quantity (Std. Price - Actual Price)} = \text{AQ} \times \text{SP} - \text{AQ} \times \text{AP}$$

$$\begin{aligned} \text{Material A} &= (930 \text{ kg} \times ₹40) - \{(40 \text{ kg} \times ₹40) + (890 \text{ kg} \times ₹42.50)\} \\ &= ₹37,200 - (₹1,600 + ₹37,825) = ₹2,225 \text{ (A)} \end{aligned}$$

$$\begin{aligned} \text{Material B} &= (1,390 \text{ kg} \times ₹30) - \{(50 \text{ kg} \times ₹30) + (1,340 \text{ kg} \times ₹25)\} \\ &= ₹41,700 - (₹1,500 + ₹33,500) = ₹6,700 \text{ (F)} \end{aligned}$$

(ii) Material Usage Variance = Std. Price (Std. Quantity - Actual Quantity)

$$\begin{aligned} \text{Material A} &= ₹40 \left\{ \left(\frac{40\% \text{ of } 2,000}{0.85} \right) - 930 \text{ kg} \right\} \\ &= ₹40 (941.18 \text{ kg.} - 930 \text{ kg}) = ₹447 \text{ (F)} \end{aligned}$$

$$\begin{aligned} \text{Material B} &= ₹30 \left\{ \left(\frac{60\% \text{ of } 2,000}{0.85} \right) - 1,390 \text{ kg} \right\} \\ &= ₹30 (1,411.76 \text{ kg.} - 1,390 \text{ kg}) = ₹653 \text{ (F)} \end{aligned}$$

(iii) Material Mix Variance = Std. Price (Revised Std. Quantity - Actual Quantity)

$$\text{Material A} = ₹40 \{(40\% \text{ of } 2,320) - 930 \text{ kg}\} = ₹80 \text{ (A)}$$

$$\text{Material B} = ₹30 \{(60\% \text{ of } 2,320) - 1,390 \text{ kg}\} = ₹60 \text{ (F)}$$

(iv) Material Yield Variance = Std. Price (Std. Quantity - Revised Std. Quantity)

$$\begin{aligned} \text{Material A} &= ₹40 \left\{ \left(\frac{40\% \text{ of } 2,000}{0.85} \right) - (40\% \text{ of } 2,320) \right\} \\ &= ₹40 \{ 941.18 \text{ kg.} - 928 \text{ kg.} \} = 527 \text{ (F)} \end{aligned}$$

$$\text{Material B} = ₹30 \left\{ \left(\frac{60\% \text{ of } 2,000}{0.85} \right) - (60\% \text{ of } 2,320) \right\}$$

$$= ₹30 \{1,411.76 \text{ kg.} - 1,392 \text{ kg.}\} = 593 \text{ (F)}$$

(v) Total Material Cost Variance = Std. Price × Std Qty. – Actual Price × Actual Qty.

$$\text{Material A} = \{[₹40 \times (\frac{40\% \text{ of } 2,000}{0.85})] - \{(40 \text{ kg} \times ₹40) + (890 \text{ kg} \times ₹42.50)\}\}$$

$$= \{₹40 \times 941.18 \text{ kg.}\} - \{₹1,600 + ₹37,825\}$$

$$= ₹37,647 - ₹39,425 = ₹1,778 \text{ (A)}$$

$$\text{Material B} = \{[₹30 \times (\frac{60\% \text{ of } 2,000}{0.85})] - \{(50 \text{ kg} \times ₹30) + (1,340 \text{ kg} \times ₹25)\}\}$$

$$= \{₹30 \times 1,411.76 \text{ kg.}\} - \{₹1,500 + ₹33,500\}$$

$$= ₹42,353 - ₹35,000 = ₹7,353 \text{ (F)}$$

10. (i) Contribution = ₹375 - ₹175 = ₹200 per unit.

$$\text{Break even Sales Quantity} = \frac{\text{Fixed cost}}{\text{Contribution margin per unit}} = \frac{₹ 3,50,00,000}{₹ 200} = 1,75,000 \text{ units}$$

$$\text{Cash Break even Sales Qty} = \frac{\text{Cash Fixed Cost}}{\text{Contribution margin per unit}} = \frac{₹2,00,00,000}{₹200} = 1,00,000 \text{ units.}$$

$$(ii) \text{ P/V ratio} = \frac{\text{Contribution/unit}}{\text{Selling Price/unit}} \times 100 = \frac{₹200}{₹375} \times 100 = 53.33\%$$

(iii) No. of units that must be sold to earn an Income (EBIT) of ₹ 25,00,000

$$\frac{\text{Fixed cost} + \text{Desired EBIT level}}{\text{Contribution margin per unit}} = \frac{3,50,00,000 + 25,00,000}{200} = 1,87,500 \text{ units}$$

(iv) After Tax Income (PAT) = ₹25,00,000

Tax rate = 40%

$$\text{Desired level of Profit before tax} = \frac{₹25,00,000}{60} \times 100 = ₹41,66,667$$

$$\text{Estimate Sales Level} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{P/V ratio}}$$

$$\text{Or, } \left(\frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution per unit}} \times \text{Selling Price per unit} \right)$$

$$= \frac{₹3,50,00,000 + ₹41,66,667}{53.33\%} = ₹7,34,42,091$$

11. (a) Production Budget (in units)

	Product- K (units)	Product- H (units)
Expected sales	8,000	4,200
Add: Closing stock	1,000	2,100
Less: Opening stock	(800)	(1,600)
Units to be produced	8,200	4,700

(b) Material Purchase Budget

	Material-X (kg.)	Material-Y (kg.)	Material-Z (ltr.)
Materials required:			
- Product-K	98,400 (8,200 units × 12 kg.)	1,23,000 (8,200 units × 15 kg.)	65,600 (8,200 units × 8 ltr.)
- Product- H	70,500 (4,700 units × 15 kg.)	28,200 (4,700 units × 6 kg.)	65,800 (4,700 units × 14ltr.)
Total	1,68,900	1,51,200	1,31,400
Add: Closing stock	30,000	18,000	7,500
Less: Opening stock	(25,000)	(30,000)	(14,000)
Quantity to be purchased	1,73,900	1,39,200	1,24,900
Rate	₹15 per kg.	₹16 per kg.	₹5 per ltr.
Purchase cost	₹ 26,08,500	₹ 22,27,200	₹ 6,24,500

(c) Direct Labour Budget

	Unskilled (hours)	Skilled (hours)
For Product K	98,400 (8,200 units × 12 hours)	65,600 (8,200 units × 8 hours)
For Product H	47,000 (4,700 units × 10 hours)	23,500 (4,700 units × 5 hours)
Labour hours required	1,45,400	89,100
Rate	₹ 40 per hour	₹ 75 per hour
Wages to be paid	₹ 58,16,000	₹ 66,82,500

12. (a) Difference between Cost Control and Cost Reduction

Cost Control	Cost Reduction
1. Cost control aims at maintaining the costs in accordance with the established standards.	1. Cost reduction is concerned with reducing costs. It challenges all standards and endeavours to better them continuously
2. Cost control seeks to attain lowest possible cost under existing conditions.	2. Cost reduction recognises no condition as permanent, since a change will result in lower cost.
3. In case of cost control, emphasis is on past and present	3. In case of cost reduction, it is on present and future.
4. Cost control is a preventive function	4. Cost reduction is a corrective function. It operates even when an efficient cost control system exists.
5. Cost control ends when targets are achieved.	5. Cost reduction has no visible end.

(b) Accounting treatment of idle time wages & overtime wages in cost accounts:

Normal idle time is treated as a part of the cost of production. Thus, in the case of direct workers, an allowance for normal idle time is built into the labour cost rates. In the case of indirect workers, normal idle time is spread over all the products or jobs through the process of absorption of factory overheads.

Under Cost Accounting, the overtime premium is treated as follows:

- If overtime is resorted to at the desire of the customer, then the overtime premium may be charged to the job directly.
- If overtime is required to cope with general production program or for meeting urgent orders, the overtime premium should be treated as overhead cost of particular department or cost center which works overtime.
- Overtime worked on account of abnormal conditions should be charged to costing Profit & Loss Account.
- If overtime is worked in a department due to the fault of another department the overtime premium should be charged to the latter department.

(c) Cost classification based on variability

- (a) **Fixed Costs** – These are the costs which are incurred for a period, and which, within certain output and turnover limits, tend to be unaffected by fluctuations in the levels of activity (output or turnover). They do not tend to increase or decrease with the changes in output. For example, rent, insurance of factory building etc., remain the same for different levels of production.

- (b) **Variable Costs** – These costs tend to vary with the volume of activity. Any increase in the activity results in an increase in the variable cost and vice-versa. For example, cost of direct labour, etc.
- (c) **Semi-variable Costs** – These costs contain both fixed and variable components and are thus partly affected by fluctuations in the level of activity. Examples of semi variable costs are telephone bills, gas and electricity etc.

Cost classification based on controllability

- (a) **Controllable Costs** - Cost that can be controlled, typically by a cost, profit or investment centre manager is called controllable cost. Controllable costs incurred in a particular responsibility centre can be influenced by the action of the executive heading that responsibility centre. For example, direct costs comprising direct labour, direct material, direct expenses and some of the overheads are generally controllable by the shop level management.
- (b) **Uncontrollable Costs** - Costs which cannot be influenced by the action of a specified member of an undertaking are known as uncontrollable costs. For example, expenditure incurred by, say, the tool room is controllable by the foreman in-charge of that section but the share of the tool-room expenditure which is apportioned to a machine shop is not to be controlled by the machine shop foreman.

**PART-II: FINANCIAL MANAGEMENT
QUESTIONS**

Time Value of Money

1. Calculate if ₹10,00,000 is invested at interest rate of 12% per annum, what is the amount after 3 years if the compounding of interest is done?
 - (i) Annually
 - (ii) Semi-annually
 - (iii) Quarterly

Ratio Analysis

2. From the following table of financial ratios of R. Textiles Limited, comment on various ratios given at the end:

Ratios	2017	2018	Average of Textile Industry
Liquidity Ratios			
Current ratio	2.2	2.5	2.5
Quick ratio	1.5	2	1.5
Receivable turnover ratio	6	6	6
Inventory turnover	9	10	6
Receivables collection period	87 days	86 days	85 days
Operating profitability			
Operating income –ROI	25%	22%	15%
Operating profit margin	19%	19%	10%
Financing decisions			
Debt ratio	49.00%	48.00%	57%
Return			
Return on equity	24%	25%	15%

Comment on the following aspect of R. Textiles Limited

- (i) Liquidity
- (ii) Operating profits
- (iii) Financing
- (iv) Return to the shareholders

Fund Flow Analysis

3. The following are the Balance Sheets of Gama Limited for the year ending March 31, 20X8 and March 31, 20X9:

Balance Sheet as at March, 31

	20X9 (₹)	20X8 (₹)
Capital and Liabilities		
Share Capital	7,87,500	6,75,000
General Reserves	2,81,250	2,25,000
Capital Reserve (Profit on Sale of investment)	11,250	-
Profit & Loss Account	2,25,000	1,12,500
15% Debentures	2,25,000	3,37,500
Accrued Expenses	13,500	11,250
Creditors	2,81,250	1,80,000
Provision for Dividends	38,250	33,750
Provision for Taxation	85,500	78,750
Total	19,48,500	16,53,750
Assets		
Fixed Assets	13,50,000	11,25,000
Less: Accumulated depreciation	2,81,250	2,25,000
Net Fixed Assets	10,68,750	9,00,000
Long-term Investments (at cost)	2,02,500	2,02,500
Stock (at cost)	3,03,750	2,25,000
Debtors (net of provision for doubtful debts of ₹ 45,000 and ₹ 56,250 respectively for 20X8 and 20X9 respectively)	2,75,625	2,53,125
Bills receivables	73,125	45,000
Prepaid Expenses	13,500	11,250
Miscellaneous Expenditure	11,250	16,875
	19,48,500	16,53,750

Additional Information:

- (i) During the year 20X8-X9, fixed assets with a net book value of ₹ 11,250 (accumulated depreciation, ₹ 33,750) was sold for ₹ 9,000.

- (ii) During the year 20X8-X9, Investments costing ₹ 90,000 were sold, and also Investments costing ₹ 90,000 were purchased.
- (iii) Debentures were retired at a Premium of 10%.
- (iv) Tax of ₹ 61,875 was paid for 20X7-X8.
- (v) During the year 20X8-X9, bad debts of ₹ 15,750 were written off against the provision for Doubtful Debt account.
- (vi) The proposed dividend for 20X7-X8 was paid in 20X8-X9.

Required:

Prepare a Funds Flow Statement (Statement of changes in Financial Position on working capital basis) for the year ended March 31, 20X9.

Cost of Capital

4. As a financial analyst of a large electronics company, you are required to determine the weighted average cost of capital of the company using (a) book value weights and (b) market value weights. The following information is available for your perusal.

The Company's present book value capital structure is:

	(₹)
Debentures (₹100 per debenture)	8,00,000
Preference shares (₹100 per share)	2,00,000
Equity shares (₹10 per share)	<u>10,00,000</u>
	<u>20,00,000</u>

All these securities are traded in the capital markets. Recent prices are:

Debentures, ₹110 per debenture, Preference shares, ₹120 per share, and Equity shares, ₹ 22 per share

Anticipated external financing opportunities are:

- (i) ₹ 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, ₹ 100
- (ii) ₹ 100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, ₹100.
- (iii) Equity shares: ₹ 2 per share flotation costs, sale price = ₹ 22.

In addition, the dividend expected on the equity share at the end of the year is ₹ 2 per share, the anticipated growth rate in dividends is 7 per cent and the firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35 per cent.

Capital Structure

5. Akash Limited provides you the following information:

	(₹)
Profit (EBIT)	2,80,000
Less: Interest on Debenture @ 10%	(40,000)
EBT	2,40,000
Less Income Tax @ 50%	(1,20,000)
	1,20,000
No. of Equity Shares (₹ 10 each)	30,000
Earnings per share (EPS)	4
Price /EPS (PE) Ratio	10

The company has reserves and surplus of ₹ 7,00,000 and required ₹ 4,00,000 further for modernisation. Return on Capital Employed (ROCE) is constant. Debt (Debt/ Debt + Equity) Ratio higher than 40% will bring the P/E Ratio down to 8 and increase the interest rate on additional debts to 12%. You are required to ascertain the probable price of the share.

- If the additional capital are raised as debt; and
- If the amount is raised by issuing equity shares at ruling market price.

Leverage

6. A Company had the following Balance Sheet as on March 31, 2019:

Equity and Liabilities	(₹ in crore)	Assets	(₹ in crore)
Equity Share Capital (10 crore shares of ₹ 10 each)	100	Fixed Assets (Net)	250
Reserves and Surplus	20	Current Assets	150
15% Debentures	200		
Current Liabilities	80		
	400		400

The additional information given is as under:

Fixed Costs per annum (excluding interest)	₹ 80 crores
Variable operating costs ratio	65%
Total Assets turnover ratio	2.5
Income-tax rate	40%

Required:

Calculate the following and comment:

- (i) Earnings per share
- (ii) Operating Leverage
- (iii) Financial Leverage
- (iv) Combined Leverage.

Capital Budgeting

7. BT Pathology Lab Ltd. is using an X-ray machines which reached at the end of their useful lives. Following new X-ray machines are of two different brands with same features are available for the purchase.

Brand	Cost of Machine	Life of Machine	Maintenance Cost			Rate of Depreciation
			Year 1-5	Year 6-10	Year 11-15	
XYZ	₹6,00,000	15 years	₹ 20,000	₹ 28,000	₹ 39,000	4%
ABC	₹4,50,000	10 years	₹ 31,000	₹ 53,000	--	6%

Residual Value of both of above machines shall be dropped by 1/3 of Purchase price in the first year and thereafter shall be depreciated at the rate mentioned above.

Alternatively, the machine of Brand ABC can also be taken on rent to be returned back to the owner after use on the following terms and conditions:

- Annual Rent shall be paid in the beginning of each year and for first year it shall be ₹ 1,02,000.
- Annual Rent for the subsequent 4 years shall be ₹ 1,02,500.
- Annual Rent for the final 5 years shall be ₹ 1,09,950.
- The Rent Agreement can be terminated by BT Labs by making a payment of ₹ 1,00,000 as penalty. This penalty would be reduced by ₹ 10,000 each year of the period of rental agreement.

You are required to:

- (a) Advise which brand of X-ray machine should be acquired assuming that the use of machine shall be continued for a period of 20 years.
- (b) State which of the option is most economical if machine is likely to be used for a period of 5 years?

The cost of capital of BT Labs is 12%.

Working Capital Management

8. A company is considering its working capital investment and financial policies for the next year. Estimated fixed assets and current liabilities for the next year are ₹ 2.60 crores and ₹ 2.34 crores respectively. Estimated Sales and EBIT depend on current assets investment, particularly inventories and book-debts. The Financial Controller of the company is examining the following alternative Working Capital Policies:

(₹ in crore)

Working Capital Policy	Investment in Current Assets	Estimated Sales	EBIT
Conservative	4.50	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use ₹ 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives.

(₹ in crore)

Financing Policy	Short-term Debt	Long-term Debt
Conservative	0.54	1.12
Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest rate-Average	12%	16%

You are required to calculate the following:

- (i) Working Capital Investment for each policy:
 - (a) Net Working Capital position
 - (b) Rate of Return
 - (c) Current ratio
- (ii) Financing for each policy:
 - (a) Net Working Capital position.
 - (b) Rate of Return on Shareholders' equity.
 - (c) Current ratio.

Management of Working Capital

9. A proforma cost sheet of a company provides the following particulars:

	Amount per unit (₹)
Raw materials cost	100.00
Direct labour cost	37.50
Overheads cost	75.00
Total cost	212.50
Profit	37.50
Selling Price	250.00

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

The credit allowed by suppliers is three weeks and company allows four weeks credit to its debtors. The lag in payment of wages is one week and lag in payment of overhead expenses is two weeks.

The Company sells one-fifth of the output against cash and maintains cash-in-hand and at bank put together at ₹37,500.

Required:

Prepare a statement showing estimate of Working Capital needed to finance an activity level of 1,30,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. Work-in-progress stock is 80% complete in all respects.

Miscellaneous

10. Write short notes on the following:
- Functions of Finance Manager.
 - Inter relationship between investment, financing and dividend decisions.
 - Debt securitisation

SUGGESTED HINTS/ANSWERS

1. Computation of future value
- Principal (P_0) = ₹ 10,00,000
- Rate of interest (i) = 12% p.a.
- Time period (n) = 3 years

Amount if compounding is done:

(i) Annually

$$\begin{aligned}\text{Future Value} &= P(1+i)^n \\ &= ₹10,00,000 (1 + 0.12)^3 \\ &= ₹10,00,000 \times 1.404928 \\ &= ₹ 14,04,928\end{aligned}$$

(ii) Semi Annually

$$\begin{aligned}\text{Future Value} &= ₹10,00,000 \left(1 + \frac{12}{100 \times 2}\right)^{3 \times 2} \\ &= ₹10,00,000 (1 + 0.06)^6 \\ &= ₹10,00,000 \times 1.418519 \\ &= ₹ 14,18,519\end{aligned}$$

(iii) Quarterly

$$\begin{aligned}\text{Future Value} &= ₹10,00,000 \left(1 + \frac{12}{100 \times 2}\right)^{3 \times 4} \\ &= ₹10,00,000 (1 + 0.03)^{12} \\ &= ₹10,00,000 \times 1.425761 \\ &= ₹14,25,761\end{aligned}$$

2.

Ratios	Comment
Liquidity	Current ratio has improved from last year and matching the industry average. Quick ratio also improved than last year and above the industry average. This may happen due to reduction in receivable collection period and quick inventory turnover. However, this also indicates idleness of funds. Overall it is reasonably good. All the liquidity ratios are either better or same in both the year compare to the Industry Average.
Operating Profits	Operating Income-ROI reduced from last year but Operating Profit Margin has been maintained. This may happen due to variability of cost on turnover. However, both the ratio are still higher than the industry average.

Financing	The company has reduced its debt capital by 1% and saved operating profit for equity shareholders. It also signifies that dependency on debt compared to other industry players (57%) is low.
Return to the shareholders	R's ROE is 24 per cent in 2017 and 25 per cent in 2018 compared to an industry average of 15 per cent. The ROE is stable and improved over the last year.

3. **Fund Flow Statement as at 31st March 20X9**

	(₹)
A. Sources of Funds:	
(i) Fund from Business Operations (W.N. 1)	3,16,125
(ii) Sale of Fixed Assets	9,000
(iii) Sale of Investments (₹ 90,000 + ₹ 11,250)	1,01,250
(iv) Issue of Shares (₹ 7,87,500 - ₹ 6,75,000)	1,12,500
Total sources	5,38,875
B. Application of Funds:	
(i) Purchase of Fixed Assets	2,70,000
(ii) Purchase of Investments	90,000
(iii) Payment to Debenture holders {(₹ 3,37,500 - ₹ 2,25,000) × 110%}	1,23,750
(iv) Payment of Dividends	33,750
Total uses	5,17,500
Increase in Working Capital (A - B)	21,375

Working Notes (W.N.):

1. Computation of Funds from Business Operation

	(₹)
Profit and loss as on March 31, 20X9	2,25,000
Add: Depreciation	90,000
Loss on Sale of Asset	2,250
Misc. Expenditure written off	5,625
Transfer to Reserves	56,250
Premium on Redemption of debentures	11,250
Provision for Dividend	38,250

	4,28,625
Less: Profit and loss as on March 31, 20X7	1,12,500
Fund from Operations	3,16,125

2. Accumulated Depreciation A/c

To Fixed Asset A/c	33,750	By Balance b/d	2,25,000
To Balance c/d	2,81,250	By P/L A/c (Prov. for depreciation) (Bal. Fig.)	90,000
	3,15,000		3,15,000

3. Fixed Assets A/c

To Balance b/d	11,25,000	By Acc. Depreciation A/c	33,750
To Bank (Purchase of Fixed Asset) (Bal. fig.)	2,70,000	By Cash	9,000
		By P/L (Loss on sale)	2,250
		By Balance c/d	13,50,000
	13,95,000		13,95,000

4. Statement of Changes in Working Capital

	March 31, 20X8	March 31, 20X9	Change in Working Capital	
			Increase	Decrease
Current Assets				
Stock	2,25,000	3,03,750	78,750	--
Debtors	2,53,125	2,75,625	22,500	--
Bills Receivables	45,000	73,125	28,125	--
Prepaid Expenses	11,250	13,500	2,250	--
	5,34,375	6,66,000	--	--
Current Liabilities				
Accrued Expenses	11,250	13,500	--	2,250
Creditors	1,80,000	2,81,250	--	1,01,250
Provision for Taxation	78,750	85,500	--	6,750
	2,70,000	3,80,250	--	--
Working Capital	2,64,375	2,85,750	--	--
Increase in Working Capital	21,375	-	-	21,375
	2,85,750	2,85,750	1,31,625	1,31,625

4. Determination of specific costs:

$$(i) \text{ Cost Debt } (K_d) = \frac{\text{Interest}(1-t) + \frac{(RV - NP)}{N}}{\frac{(RV + NP)}{2}} = \frac{₹11(1-0.35) + \frac{(₹100 - ₹96)}{10 \text{ years}}}{\frac{(₹100 + ₹96)}{2}}$$

$$= \frac{₹7.15 + ₹0.4}{₹98} = 0.077 \text{ or } 7.70\%$$

$$(ii) \text{ Cost of Preference Shares } (K_p) = \frac{PD + \frac{(RV - NP)}{N}}{\frac{(RV + NP)}{2}} = \frac{₹12 + \frac{(₹100 - ₹95)}{10 \text{ years}}}{\frac{(₹100 + ₹95)}{2}}$$

$$= \frac{₹12 + ₹0.5}{₹97.5} = 0.1282 \text{ or } 12.82\%$$

$$(iii) \text{ Cost of Equity shares } (K_e) = \frac{D_1}{P_0} + G = \frac{₹2}{₹22 - ₹2} + 0.07 = 0.17 \text{ or } 17\%$$

I – Interest, t – Tax, RV- Redeemable value, NP- Net proceeds, N- No. of years, PD- Preference dividend, D₁- Expected Dividend, P₀- Price of share (net)

Using these specific costs, we can calculate WACC on the basis of book value and market value weights as follows:

(a) Weighted Average Cost of Capital (K_0) based on Book value weights

Source of capital	Book value (₹)	Weights	Specific cost (%)	WACC (%)
Debentures	8,00,000	0.40	7.70	3.08
Preferences shares	2,00,000	0.10	12.82	1.28
Equity shares	10,00,000	0.50	17.00	8.50
	20,00,000	1.00		12.86

(b) Weighted Average Cost of Capital (K_0) based on market value weights:

Source of capital	Market value (₹)	Weights	Specific cost (%)	WACC (%)
Debentures	8,80,000	0.265	7.70	2.04

$\left(\frac{₹8,00,000}{₹100} \times ₹110 \right)$				
Preferences shares $\left(\frac{₹2,00,000}{₹100} \times ₹120 \right)$	2,40,000	0.072	12.82	0.92
Equity shares $\left(\frac{₹10,00,000}{₹10} \times ₹22 \right)$	22,00,000	0.663	17.00	11.27
	33,20,000	1.000		14.23

5. Ascertainment of probable price of shares of Akash limited

Particulars	Plan-I	Plan-II
	If ₹ 4,00,000 is raised as debt (₹)	If ₹ 4,00,000 is raised by issuing equity shares (₹)
Earnings Before Interest and Tax (EBIT) {20% of new capital i.e. 20% of (₹14,00,000 + ₹4,00,000)} (Refer working note1)	3,60,000	3,60,000
Less: Interest on old debentures (10% of ₹4,00,000)	(40,000)	(40,000)
Less: Interest on new debt (12% of ₹4,00,000)	(48,000)	--
Earnings Before Tax (EBT)	2,72,000	3,20,000
Less: Tax @ 50%	(1,36,000)	(1,60,000)
Earnings for equity shareholders (EAT)	1,36,000	1,60,000
No. of Equity Shares (refer working note 2)	30,000	40,000
Earnings per Share (EPS)	₹ 4.53	₹ 4.00
Price/ Earnings (P/E) Ratio (refer working note 3)	8	10
Probable Price Per Share (PE Ratio × EPS)	₹ 36.24	₹ 40

Working Notes:

1. Calculation of existing Return of Capital Employed (ROCE):

	(₹)
Equity Share capital (30,000 shares × ₹10)	3,00,000

10% Debentures $\left(₹40,000 \times \frac{100}{10} \right)$	4,00,000
Reserves and Surplus	7,00,000
Total Capital Employed	14,00,000
Earnings before interest and tax (EBIT) (given)	2,80,000
ROCE = $\frac{₹2,80,000}{₹14,00,000} \times 100$	20%

2. Number of Equity Shares to be issued in Plan-II:

$$= \frac{₹4,00,000}{₹40} = 10,000 \text{ shares}$$

Thus, after the issue total number of shares = 30,000 + 10,000 = 40,000 shares

3. Debt/Equity Ratio if ₹ 4,00,000 is raised as debt:

$$= \frac{₹8,00,000}{₹18,00,000} \times 100 = 44.44\%$$

As the debt equity ratio is more than 40% the P/E ratio will be brought down to 8 in Plan-I

6. Total Assets = ₹ 400 crores
 Asset Turnover Ratio = 2.5
 Hence, Total Sales = 400×2.5 = ₹ 1,000 crores

Computation of Profits after Tax (PAT)

	(₹ in crore)
Sales	1,000
Less: Variable operating cost (65% of ₹1,000 crore)	(650)
Contribution	350
Less: Fixed cost (other than Interest)	(80)
EBIT	270
Less: Interest on debentures (15% × ₹200 crore)	(30)
EBT	240
Less: Tax 40%	(96)
EAT (earnings available to equity share holders)	144

(i) Earnings per share (EPS)

$$\therefore \text{EPS} = \frac{\text{₹ 144 crores}}{10 \text{ crore equity shares}} = \text{₹ 14.40}$$

(ii) Operating Leverage

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{350}{270} = 1.296$$

It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial Leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{270}{240} = 1.125$$

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

(iv) Combined Leverage

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}$$

$$\text{Or, Operating Leverage} \times \text{Financial Leverage} = 1.296 \times 1.125 = 1.458$$

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales.

7. Since the life span of each machine is different and time span exceeds the useful lives of each model, we shall use Equivalent Annual Cost method to decide which brand should be chosen.

(i) If machine is used for 20 years

Present Value (PV) of cost if machine of Brand XYZ is purchased

Period	Cash Outflow (₹)	PVF@12%	Present Value
0	6,00,000	1.000	6,00,000
1-5	20,000	3.605	72,100
6-10	28,000	2.045	57,260
11-15	39,000	1.161	45,279
15	(64,000)	0.183	(11,712)
			7,62,927

PVAF for 1-15 years 6.811

$$\text{Equivalent Annual Cost} = \frac{\text{₹}7,62,927}{6.811} = \text{₹} 1,12,014$$

Present Value (PV) of cost if machine of Brand ABC is purchased

Period	Cash Outflow (₹)	PVF@12%	Present Value
0	4,50,000	1.000	4,50,000
1 - 5	31,000	3.605	1,11,755
6 -10	53,000	2.045	1,08,385
10	(57,000)	0.322	(18,354)
			6,51,786

PVAF for 1-10 years 5.65

$$\text{Equivalent Annual Cost} = \frac{\text{₹}6,51,786}{5.65} = \text{₹} 1,15,360$$

Present Value (PV) of cost if machine of Brand ABC is taken on Rent

Period	Cash Outflow (₹)	PVF@12%	Present Value
0	1,02,000	1.000	1,02,000
1 - 4	1,02,500	3.037	3,11,293
5-9	1,09,950	2.291	2,51,895
			6,65,188

PVAF for 1-10 years 5.65

$$\text{Equivalent Annual Cost} = \frac{\text{₹}6,65,188}{5.65} = \text{₹} 1,17,732$$

Decision: Since Equivalent Annual Cash Outflow is least in case of purchase of Machine of brand XYZ the same should be purchased.

(ii) **If machine is used for 5 years**

(a) Scrap Value of Machine of Brand XYZ

$$= \text{₹} 6,00,000 - \text{₹} 2,00,000 - \text{₹} 6,00,000 \times 0.04 \times 4 = \text{₹} 3,04,000$$

(b) Scrap Value of Machine of Brand ABC

$$= \text{₹} 4,50,000 - \text{₹} 1,50,000 - \text{₹} 4,50,000 \times 0.06 \times 4 = \text{₹} 1,92,000$$

Present Value (PV) of cost if machine of Brand XYZ is purchased

Period	Cash Outflow (₹)	PVF@12%	Present Value
0	6,00,000	1.000	6,00,000
1 - 5	20,000	3.605	72,100
5	(3,04,000)	0.567	(1,72,368)
			4,99,732

Present Value (PV) of cost if machine of Brand ABC is purchased

Period	Cash Outflow (₹)	PVF@12%	Present Value
0	4,50,000	1.000	4,50,000
1-5	31,000	3.605	1,11,755
5	(1,92,000)	0.567	(1,08,864)
			4,52,891

Present Value (PV) of cost if machine of Brand ABC is taken on Rent

Period	Cash Outflow (₹)	PVF@12%	Present Value
0	1,02,000	1.000	1,02,000
1-4	1,02,500	3.037	3,11,293
5	50,000	0.567	28,350
			4,41,643

Decision: Since Cash Outflow is least in case of lease of Machine of brand ABC the same should be taken on rent.

8. (i) Statement showing Working Capital Investment for each policy

(₹ in crore)

	Working Capital Policy		
	Conservative	Moderate	Aggressive
Current Assets: (i)	4.50	3.90	2.60
Fixed Assets: (ii)	2.60	2.60	2.60
Total Assets: (iii)	7.10	6.50	5.20
Current liabilities: (iv)	2.34	2.34	2.34
Net Worth: (v) = (iii) - (iv)	4.76	4.16	2.86
Total liabilities: (iv) + (v)	7.10	6.50	5.20
Estimated Sales: (vi)	12.30	11.50	10.00

EBIT: (vii)	1.23	1.15	1.00
(a) Net working capital position: (i) - (iv)	2.16	1.56	0.26
(b) Rate of return: (vii) / (iii)	17.32%	17.69%	19.23%
(c) Current ratio: (i) / (iv)	1.92	1.67	1.11

(ii) Statement Showing Effect of Alternative Financing Policy

(₹ in crore)

Financing Policy	Conservative	Moderate	Aggressive
Current Assets (i)	3.90	3.90	3.90
Fixed Assets (ii)	2.60	2.60	2.60
Total Assets (iii)	6.50	6.50	6.50
Current Liabilities (iv)	2.34	2.34	2.34
Short term Debt (v)	0.54	1.00	1.50
Total current liabilities (vi) = (iv) + (v)	2.88	3.34	3.84
Long term Debt (vii)	1.12	0.66	0.16
Equity Capital (viii)	2.50	2.50	2.50
Total liabilities (ix) = (vi)+(vii)+(viii)	6.50	6.50	6.50
Forecasted Sales	11.50	11.50	11.50
EBIT (x)	1.15	1.15	1.15
Less: Interest on short-term debt (12% of ₹0.54)	0.06	0.12 (12% of ₹ 1)	0.18 (12% of ₹ 1.5)
Interest on long term debt (16% of ₹1.12)	0.18	0.11 (16% of ₹0.66)	0.03 (16% of ₹0.16)
Earnings before tax (EBT) (xi)	0.91	0.92	0.94
Taxes @ 35% (xii)	0.32	0.32	0.33
Earnings after tax: (xiii) = (xi) – (xii)	0.59	0.60	0.61
(a) Net Working Capital Position: (i) - [(iv) + (v)]	1.02	0.56	0.06
(b) Rate of return on shareholders Equity capital: (xiii) / (viii)	23.6%	24.0%	24.4%
(c) Current Ratio (i) / (vi)	1.35	1.17	1.02

9. Statement showing Estimate of Working Capital Needs

	(Amount in ₹)	(Amount in ₹)
A. Current Assets		
(i) Inventories:		
Raw material (1 month or 4 weeks) $\left(\frac{1,30,000 \text{ units} \times ₹100}{52 \text{ weeks}} \times 4 \text{ weeks} \right)$	10,00,000	
WIP Inventory (1 week) $\left(\frac{1,30,000 \text{ units} \times ₹212.50}{52 \text{ weeks}} \times 1 \text{ week} \right) \times 0.8$	4,25,000	
Finished goods inventory (2 weeks) $\left(\frac{1,30,000 \text{ units} \times ₹212.50}{52 \text{ weeks}} \times 2 \text{ weeks} \right)$	10,62,500	24,87,500
(ii) Receivables (Debtors) (4 weeks) $\left(\frac{1,30,000 \text{ units} \times ₹212.50}{52 \text{ weeks}} \times 4 \text{ weeks} \right) \times \frac{4}{5_{th}}$		17,00,000
(iii) Cash and bank balance		37,500
Total Current Assets		42,25,000
B. Current Liabilities:		
(i) Payables (Creditors) for materials (3 weeks) $\left(\frac{1,30,000 \text{ units} \times ₹100}{52 \text{ weeks}} \times 3 \text{ weeks} \right)$		7,50,000
(ii) Outstanding wages (1 week) $\left(\frac{1,30,000 \text{ units} \times ₹37.50}{52 \text{ weeks}} \times 1 \text{ week} \right)$		93,750
(iii) Outstanding overheads (2 weeks) $\left(\frac{1,30,000 \text{ units} \times ₹75}{52 \text{ weeks}} \times 2 \text{ weeks} \right)$		3,75,000
Total Current Liabilities		12,18,750
Net Working Capital Needs (A – B)		30,06,250

10. (a) Functions of Finance Manager

The Finance Manager's main objective is to manage funds in such a way so as to ensure their optimum utilisation and their procurement in a manner that the risk, cost and control considerations are properly balanced in a given situation. To achieve these objectives the Finance Manager performs the following functions:

- (i) *Estimating the requirement of Funds:* Both for long-term purposes i.e. investment in fixed assets and for short-term i.e. for working capital. Forecasting the requirements of funds involves the use of techniques of budgetary control and long-range planning.
- (ii) *Decision regarding Capital Structure:* Once the requirement of funds has been estimated, a decision regarding various sources from which these funds would be raised has to be taken. A proper balance has to be made between the loan funds and own funds. He has to ensure that he raises sufficient long term funds to finance fixed assets and other long term investments and to provide for the needs of working capital.
- (iii) *Investment Decision:* The investment of funds, in a project has to be made after careful assessment of various projects through capital budgeting. Assets management policies are to be laid down regarding various items of current assets. For e.g. receivable in coordination with sales manager, inventory in coordination with production manager.
- (iv) *Dividend decision:* The finance manager is concerned with the decision as to how much to retain and what portion to pay as dividend depending on the company's policy. Trend of earnings, trend of share market prices, requirement of funds for future growth, cash flow situation etc., are to be considered.
- (v) *Evaluating financial performance:* A finance manager has to constantly review the financial performance of the various units of organisation generally in terms of ROI. Such a review helps the management in seeing how the funds have been utilised in various divisions and what can be done to improve it.
- (vi) *Financial negotiation:* The finance manager plays a very important role in carrying out negotiations with the financial institutions, banks and public depositors for raising of funds on favourable terms.
- (vii) *Cash management:* The finance manager lays down the cash management and cash disbursement policies with a view to supply adequate funds to all units of organisation and to ensure that there is no excessive cash.
- (viii) *Keeping touch with stock exchange:* Finance manager is required to analyse major trends in stock market and their impact on the price of the company share.

(b) Inter-relationship between Investment, Financing and Dividend Decisions

The finance functions are divided into three major decisions, viz., investment, financing and dividend decisions. It is correct to say that these decisions are inter-related because the underlying objective of these three decisions is the same, i.e. maximisation of shareholders' wealth. Since investment, financing and dividend decisions are all interrelated, one has to consider the joint impact of these decisions on the market price of the company's shares and these decisions should also be solved jointly. The decision to invest in a new project needs the finance for the investment. The financing decision, in turn, is influenced by and influences dividend decision because retained earnings used in internal financing deprive shareholders of their dividends. An efficient financial management can ensure optimal joint decisions. This is possible by evaluating each decision in relation to its effect on the shareholders' wealth.

The above three decisions are briefly examined below in the light of their inter-relationship and to see how they can help in maximising the shareholders' wealth i.e. market price of the company's shares.

Investment decision: The investment of long term funds is made after a careful assessment of the various projects through capital budgeting and uncertainty analysis. However, only that investment proposal is to be accepted which is expected to yield at least so much return as is adequate to meet its cost of financing. This has an influence on the profitability of the company and ultimately on its wealth.

Financing decision: Funds can be raised from various sources. Each source of funds involves different issues. The finance manager has to maintain a proper balance between long-term and short-term funds. With the total volume of long-term funds, he has to ensure a proper mix of loan funds and owner's funds. The optimum financing mix will increase return to equity shareholders and thus maximise their wealth.

Dividend decision: The finance manager is also concerned with the decision to pay or declare dividend. He assists the top management in deciding as to what portion of the profit should be paid to the shareholders by way of dividends and what portion should be retained in the business. An optimal dividend pay-out ratio maximises shareholders' wealth.

The above discussion makes it clear that investment, financing and dividend decisions are interrelated and are to be taken jointly keeping in view their joint effect on the shareholders' wealth.

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

Process of Debt Securitisation

- (i) *The origination function* – A borrower seeks a loan from a finance company, bank. The credit worthiness of borrower is evaluated and contract is entered into with repayment schedule structured over the life of the loan.
- (ii) *The pooling function* – Similar loans on receivables are clubbed together to create an underlying pool of assets. The pool is transferred in favour of Special purpose Vehicle (SPV), which acts as a trustee for investors.
- (iii) *The securitisation function* – SPV will structure and issue securities on the basis of asset pool. The securities carry a coupon and expected maturity which can be asset-based/mortgage based. These are generally sold to investors through merchant bankers. Investors are – pension funds, mutual funds, insurance funds.