PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I: COST ACCOUNTING

QUESTIONS

Material

1. Arnav Electronics manufactures electronic home appliances. It follows weighted average Cost method for inventory valuation. Following are the data of component X:

Date	Particulars	Units	Rate per unit (₹)
15-12-19	Purchase Order- 008	10,000	9,930
30-12-19	Purchase Order- 009	10,000	9,780
01-01-20	Opening stock	3,500	9,810
05-01-20	GRN*-008 (against the Purchase Order- 008)	10,000	-
05-01-20	MRN**-003 (against the Purchase Order- 008)	500	-
06-01-20	Material Requisition-011	3,000	-
07-01-20	Purchase Order- 010	10,000	9,750
10-01-20	Material Requisition-012	4,500	-
12-01-20	GRN-009 (against the Purchase Order- 009)	10,000	-
12-01-20	MRN-004 (against the Purchase Order- 009)	400	-
15-01-20	Material Requisition-013	2,200	-
24-01-20	Material Requisition-014	1,500	-
25-01-20	GRN-010 (against the Purchase Order- 010)	10,000	-
28-01-20	Material Requisition-015	4,000	-
31-01-20	Material Requisition-016	3,200	-

*GRN- Goods Received Note; **MRN- Material Returned Note

Based on the above data, you are required to calculate:

(i) Re-order level

(ii) Maximum stock level

(iii) Minimum stock level

(iv) Value of components used during the month of January, 2020.

(v) Inventory turnover ratio.

(vi) PREPARE Store Ledger for the period January 2020 and DETERMINE the value of stock as on 31-01-2020.

Labour

2. From the following information, calculate employee turnover rate using – (i) Separation Method, (ii) Replacement Method, (iii) New Recruitment Method, and (iv) Flux Method:

   No. of workers as on 01.01.2019 = 3,600

   No. of workers as on 31.12.2019 = 3,790

   During the year, 40 workers left while 120 workers were discharged. 350 workers were recruited during the year, of these 150 workers were recruited because of exits and the rest were recruited in accordance with expansion plans.

Overheads

3. ABC Ltd. has three production departments P_1, P_2 and P_3 and two service departments S_1 and S_2. The following data are extracted from the records of the company for the month of January, 2020:

	(₹)
Rent and rates	6,25,000
General lighting	7,50,000
Indirect wages	1,87,500
Power	25,00,000
Depreciation on machinery	5,00,000
Insurance of machinery	2,00,000

Other Information:

	P_1	P_2	P_3	S_1	S_2
Direct wages (₹)	3,75,000	2,50,000	3,75,000	1,87,500	62,500
Horse Power of Machines used	60	30	50	10	–
Cost of machinery (₹)	30,00,000	40,00,000	50,00,000	2,50,000	2,50,000
Floor space (Sq. ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	–	–

Expenses of the service departments S_1 and S_2 are reapportioned as below:

	P_1	P_2	P_3	S_1	S_2
S_1	20%	30%	40%	–	10%
S_2	40%	20%	30%	10%	–

Required:

(i) Compute overhead absorption rate per production hour for each production department.

(ii) Determine the total cost of product X which is processed for manufacture in department P_1, P_2 and P_3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is ₹6,250 and direct labour cost is ₹ 3,750.

Non-Integrated Accounting

4. The following are the balances existed in the books of JPG Ltd. for the year ended, 31st March, 2019:

Particulars	Dr. (₹)	Cr. (₹)
Stores Ledger Control A/c	30,00,000	
WIP Control A/c	15,00,000	
Finished Goods Control A/c	25,00,000	
Manufacturing Overheads Control A/c		1,50,000
Cost Ledger Control A/c		68,50,000

During the year 2019-20, the following transactions took place:

Particulars	Amount (₹)
Finished product (at cost)	22,50,000
Manufacturing Overhead incurred	8,50,000
Raw material purchased	12,50,000
Factory wages	4,00,000
Indirect labour	2,00,000
Cost of sales	17,50,000
Materials issued to production	13,50,000
Sales returned (at cost)	90,000
Material returned to suppliers	1,30,000
Manufacturing overhead charged to production	8,50,000

Required:

Prepare the following control accounts and Trial balance at the end of the year:

Cost Ledger, Stores Ledger, Work-in-process, Finished Stock, Manufacturing Overhead, Wages and Cost of Sales.

Job Costing

5. A factory uses job costing system. The following data are obtained from its books for the year ended 31st March, 2020:

	Amount (₹)
Direct materials	18,00,000
Direct wages	15,00,000
Selling and distribution overheads	10,50,000
Administration overheads	8,40,000
Factory overheads	9,00,000
Profit	12,18,000

(i) Prepare a Job Cost sheet indicating the Prime cost, Cost of Production, Cost of sales and the Sales value.

(ii) In 2019-20, the factory received an order for a job. It is estimated that direct materials required will be ₹ 4,80,000 and direct labour will cost ₹ 3,00,000. Determine what should be the price for the job if factory intends to earn the same rate of profit on sales assuming that the selling and distribution overheads have gone up by 15%. The factory overheads is recovered as percentage of wages paid, whereas, other overheads as a percentage of cost of production, based on cost rates prevailing in the previous year.

Process Costing

6. Star 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 papers containing records of the process operations for the month.

Star 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 1,600 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 1,06,560.
- Closing work-in-process at the end of the month was 320 litres, 30% complete for labour and 20% complete for overheads.
- Normal loss is 10% of input and total losses during the month were 1,200 litres partly due to the fire damage.

- Output sent to finished goods warehouse was 8,400 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 ₹78 for the month made up as follows:

	(₹)
Raw Material	46
Labour	14
Overheads	18
	78

Required:

(i) Calculate the quantity (in litres) of raw material inputs during the month.

(ii) 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.

(iii) Calculate the values of raw material, labour and overheads added to the process during the month.

(iv) Prepare the process account for the month.

Operating Costing

7. SMC is a public school having five buses each plying in different directions for the transport of its school students. In view of a larger number of students availing of the bus service the buses work two shifts daily both in the morning and in the afternoon. The buses are garaged in the school. The work-load of the students has been so arranged that in the morning the first trip picks up senior students and the second trip plying an hour later picks up the junior students. Similarly in the afternoon the first trip takes the junior students and an hour later the second trip takes the senior students home.

The distance travelled by each bus one way is 10 km. The school works 25 days in a month and remains closed for vacation in May, June and December. Bus fee, however, is payable by the students for all 12 months in a year.

The details of expenses for a year are as under:

Driver's salary	₹ 9,000 per month per driver
Cleaner's salary	₹ 6,000 per month
(Salary payable for all 12 months)	
(one cleaner employed for all the five buses)	
Licence fee, taxes, etc.	₹ 8,600 per bus per annum

Insurance	₹ 10,000 per bus per annum
Repairs & maintenance	₹ 35,000 per bus per annum
Purchase price of the bus	₹ 15,00,000 each
Life of each bus	12 years
Scrap value of buses at the end of life	₹ 3,00,000
Diesel cost	₹ 65.00 per litre

Each bus gives an average mileage of 4 km. per litre of diesel.

Seating capacity of each bus is 50 students.

The seating capacity is fully occupied during the whole year.

Students picked up and dropped within a range upto 5 km. of distance from the school are charged half fare and fifty per cent of the students travelling in each trip are in this category. Ignore interest. Since the charges are to be based on average cost you are required to :

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of five buses for a year.

(ii) Work out the average cost per student per month in respect of –

(A) students coming from a distance of upto 5 km. from the school and

(B) students coming from a distance beyond 5 km. from the school.

Standard Costing

8. ABC Ltd. had prepared the following estimation for the month of January:

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	90.00	72,000
Material-B	600 kg.	60.00	36,000
Skilled labour	1,000 hours	75.00	75,000
Unskilled labour	800 hours	44.00	35,200

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.	86.00	77,400
Material-B	650 kg.	65.00	42,250

Skilled labour	1,200 hours	71.00	85,200
Unskilled labour	860 hours	46.00	39,560

You are required to calculate:

(a) Material Cost Variance;

(b) Material Price Variance;

(c) Material Mix Variance;

(d) Material Yield Variance;

(e) Labour Cost Variance;

(f) Labour Efficiency Variance; and

(g) Labour Yield Variance.

Marginal Costing

9. A Ltd. manufacture and sales its product R-9. The following figures have been collected from cost records of last year for the product R-9:

Elements of Cost	Variable Cost portion	Fixed Cost
Direct Material	30% of Cost of Goods Sold	--
Direct Labour	15% of Cost of Goods Sold	--
Factory Overhead	10% of Cost of Goods Sold	₹ 2,30,000
Administration Overhead	2% of Cost of Goods Sold	₹ 71,000
Selling & Distribution Overhead	4% of Cost of Sales	₹ 68,000

Last Year 5,000 units were sold at ₹185 per unit. From the given information, determine the following:

(i) Break-even Sales (in rupees)

(ii) Profit earned during last year

(iii) Margin of safety (in %)

(iv) Profit if the sales were 10% less than the actual sales.

(Assume that Administration Overhead is related with production activity)

Budget and Budgetary Control

10. A Vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

Month	No. of vehicles
October	40,000

November	35,000
December	45,000
January	60,000
February	65,000

To manufacture a vehicle a standard cost of ₹11,42,800 is incurred and sold through dealers at a uniform selling price of ₹17,14,200 to customers. Dealers are paid 15% commission on selling price on sale of a vehicle.

Apart from other materials, four units of Part - X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part-X at the end of each month to cover 40% of next month's production. 48,000 units of Part-X are in stock as on 1st October.

There are 9,500 nos. of completed vehicles in stock as on 1st October and it is policy to have stocks at the end of each month to cover 20% of the next month's sales.

You are required to -

(i) Prepare Production budget (in nos.) for the month of October, November, December and January.

(ii) Prepare a Purchase budget for Part-X (in units) for the months of October, November and December.

(iii) Calculate the budgeted gross profit for the quarter October to December.

Miscellaneous

11. (a) Differentiate between Cost Accounting and Management Accounting.

(b) Discuss the impact of Information Technology (IT) on cost accounting system.

(c) Discuss the Escalation Clause in a Contract.

(d) Discuss the treatment of by-product cost in cost accounting.

SUGGESTED HINTS/ANSWERS

1. Workings:

Consumption is calculated on the basis of material requisitions:

Maximum component usage = 4,500 units (Material requisition on 10-01-20)

Minimum component usage = 1,500 units (Material requisition on 24-01-20)

Lead time is calculated from purchase order date to material received date

Maximum lead time = 21 days (15-12-2019 to 05-01-2020)

Minimum lead time = 14 days (30-12-2019 to 12-01-2020)

Calculations:

(i) Re-order level

= Maximum usage × Maximum lead time

= 4,500 units × 21 days = 94,500 units

(ii) Maximum stock level

= Re-order level + Re-order Quantity – (Min. Usage × Min. lead time)

= 94,500 units + 10,000 units – (1,500 units × 14 days)

= 1,04,500 units – 21,000 units = 83,500 units

(iii) Minimum stock level

= Re-order level – (Avg. consumption × Avg. lead time)

= 94,500 units – (3,000 units × 17.5 days)

= 94,500 units – 52,500 units

= 42,000 units

(iv) Value of components used during the month of January 2020:

Sum of material requisitions 011 to 016 ('000)

= ₹ 29,694 + ₹ 44,541 + ₹ 21,611 + ₹ 14,734 + ₹ 39,156 + ₹ 31,325 = ₹ 1,81,061

(v) Inventory Turnover Ratio

$$= \frac{\text{Value of materials used}}{\text{Average stock value}}$$

$$= \frac{₹\,1,81,061}{₹(1,39,001+34,335)/2} = \frac{₹\,1,81,061}{₹\,86,668} = 2.09$$

(vi) Store Ledger for the month of January 2020:

Date	Receipts				Issue				Balance		
	GRN/ MRN	Units	Rate ₹	Amt. (₹ '000)	MRN/ MR	Units	Rate ₹	Amt. (₹ '000)	Units	Rate ₹	Amt. (₹ '000)
01-01-20	-	-	-	-	-	-	-	-	3,500	9,810	34,335
05-01-20	008	10,000	9,930	99,300	003	500	9,930	4,965	13,000	9,898	1,28,670
06-01-20	-	-	-	-	011	3,000	9,898	29,694	10,000	9,898	98,980
10-01-20	-	-	-	-	012	4,500	9,898	44,541	5,500	9,898	54,439
12-01-20	009	10,000	9,780	97,800	004	400	9,780	3,912	15,100	9,823	1,48,327
15-01-20	-	-	-	-	013	2,200	9,823	21,611	12,900	9,823	1,26,716
24-01-20	-	-	-	-	014	1,500	9,823	14,734	11,400	9,823	1,11,982

25-01-20	010	10,000	9,750	97,500	-	-	-	-	21,400	9,789	2,09,482
28-01-20	-	-	-	-	015	4,000	9,789	39,156	17,400	9,789	1,70,326
31-01-20	-	-	-	-	016	3,200	9,789	31,325	14,200	9,789	1,39,001

[Note: Decimal figures may be rounded-off to the nearest rupee value wherever required)

Value of stock as on 31-01-2020 ('000) = ₹1,39,001

2. Employee turnover rate using:

(i) Separation Method:

$$= \frac{\text{No. of workers left + No. of workers discharged}}{\text{Average number of workers}} \times 100$$

$$= \frac{(40+120)}{(3,600+3,790)/2} \times 100 = \frac{160}{3,695} \times 100 = 4.33\%$$

(ii) Replacement Method:

$$= \frac{\text{No. of workers replaced}}{\text{Average number of workers}} \times 100 = \frac{150}{3,695} \times 100 = 4.06\%$$

(iii) New Recruitment Method:

$$= \frac{\text{No. of workers newly recruited}}{\text{Average number of workers}} \times 100$$

$$= \frac{\text{No. Recruitments - No. of Replacements}}{\text{Average number of workers}} \times 100$$

$$= \frac{350-150}{3,695} \times 100 = \frac{200}{3,695} \times 100 = 5.41\%$$

(iv) Flux Method:

$$= \frac{\text{No. of separations + No. of accessions}}{\text{Average number of workers}} \times 100$$

$$= \frac{(160+350)}{(3,600+3,790)/2} \times 100 = \frac{510}{3,695} \times 100 = 13.80\%$$

3. Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)	S_1 (₹)	S_2 (₹)
Direct wages	Actual	2,50,000	--	--	--	1,87,500	62,500

Rent and rates	Floor area (4 : 5 : 6 : 4 : 1)	6,25,000	1,25,000	1,56,250	1,87,500	1,25,000	31,250
General lighting	Light points (2 : 3 : 4 : 2 : 1)	7,50,000	1,25,000	1,87,500	2,50,000	1,25,000	62,500
Indirect wages	Direct wages (6 : 4 : 6 : 3 : 1)	1,87,500	56,250	37,500	56,250	28,125	9,375
Power	Horse Power of machines used (6 : 3 : 5 : 1)	25,00,000	10,00,000	5,00,000	8,33,333	1,66,667	–
Depreciation of machinery	Value of machinery (12:16:20:1:1)	5,00,000	1,20,000	1,60,000	2,00,000	10,000	10,000
Insurance of machinery	Value of machinery (12:16:20:1:1)	2,00,000	48,000	64,000	80,000	4,000	4,000
		50,12,500	14,74,250	11,05,250	16,07,083	6,46,292	1,79,625

Overheads of service cost centres:

Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2.

$S_1 = 6,46,292 + 0.10\ S_2$

$S_2 = 1,79,625 + 0.10\ S_1$

Substituting the value of S_2 in S_1 we get

$S_1 = 6,46,292 + 0.10\ (1,79,625 + 0.10\ S_1)$

$S_1 = 6,46,292 + 17,962.5 + 0.01\ S_1$

$0.99\ S_1 = 6,64,254.5$

$\therefore S_1$ = ₹6,70,964

$\therefore S_2$ = $1,79,625 + 0.10 \times 6,70,964$

= ₹2,46,721.4

Secondary Distribution Summary

Particulars	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)
Allocated and Apportioned overheads as per primary distribution	41,86,583	14,74,250	11,05,250	16,07,083

S_1	6,70,964	1,34,192.8	2,01,289.2	2,68,385.6
S_2	2,46,721.4	98,688.6	49,344.3	74,016.5
		17,07,131.4	13,55,883.5	19,49,485.1

(i) Overhead rate per hour

	P_1	P_2	P_3
Total overheads cost (₹)	17,07,131.4	13,55,883.5	19,49,485.1
Production hours worked	6,225	4,050	4,100
Rate per hour (₹)	274.24	334.79	475.48

(ii) Cost of Product X

	(₹)
Direct material	6,250.00
Direct labour	3,750.00
Prime cost	10,000.00
Production on overheads	
P_1 5 hours × ₹ 274.24 = 1,371.20	
P_2 3 hours × ₹ 334.79 = 1,004.37	
P_3 4 hours × ₹ 475.48 = 1,901.92	4,277.49
Factory cost	14,277.49

4. Cost Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Stores Ledger control A/c	1,30,000	By Balance b/d	68,50,000
To Costing Profit & Loss A/c	17,10,000	By Stores Ledger control A/c	12,50,000
		By Wages Control A/c	6,00,000
To Balance c/d	77,10,000	By Manufacturing overhead control A/c	8,50,000
	95,50,000		95,50,000

Store Ledger Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	30,00,000	By WIP Control A/c	13,50,000

To Cost Ledger control A/c	12,50,000	By Cost Ledger control A/c (return)	1,30,000
		By Balance c/d	27,70,000
	42,50,000		42,50,000

WIP Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	15,00,000	By Finished Stock Control A/c	22,50,000
To Wages Control A/c	4,00,000		
To Stores Ledger control A/c	13,50,000		
To Manufacturing overhead control A/c	8,50,000	By Balance c/d	18,50,000
	41,00,000		41,00,000

Finished Stock Control Account

Particulars	(₹)	Particulars	(₹)
To Balance b/d	25,00,000	By Cost of Sales A/c	17,50,000
To WIP Control A/c	22,50,000		
To Cost of Sales A/c (sales return)	90,000	By Balance c/d	30,90,000
	48,40,000		48,40,000

Manufacturing Overhead Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	8,50,000	By Balance b/d	1,50,000
To Wages Control A/c	2,00,000	By WIP Control A/c	8,50,000
		By Costing P&L A/c (under recovery)	50,000
	10,50,000		10,50,000

Wages Control Account

Particulars	(₹)	Particulars	(₹)
To Cost Ledger Control A/c	6,00,000	By WIP Control A/c	4,00,000
		By Manufacturing overhead control A/c	2,00,000
	6,00,000		6,00,000

Cost of Sales Account

Particulars	(₹)	Particulars	(₹)
To Finished Stock Control A/c	17,50,000	By Finished Stock Control A/c (sales return)	90,000
		By Costing Profit & Loss A/c	16,60,000
	17,50,000		17,50,000

Trial Balance

Particulars	Dr.	Cr.
	(₹)	(₹)
Stores Ledger Control A/c	27,70,000	
WIP Control A/c	18,50,000	
Finished Goods Control A/c	30,90,000	
Cost Ledger Control A/c		77,10,000
	77,10,000	77,10,000

Working:

Costing P&L Account

Particulars	(₹)	Particulars	(₹)
To Cost of Sales A/c	16,60,000	By Cost Ledger control A/c	17,10,000
To Manufacturing overhead control A/c	50,000		
	17,10,000		17,10,000

5. (i) Production Statement

For the year ended 31st March, 2020

		Amount (₹)
Direct materials		18,00,000
Direct wages		15,00,000
	Prime Cost	33,00,000
Factory overheads		9,00,000
	Cost of Production	42,00,000
Administration overheads		8,40,000

Selling and distribution overheads		10,50,000
	Cost of Sales	60,90,000
Profit		12,18,000
	Sales value	73,08,000

Calculation of Rates:

1. Percentage of factory overheads to direct wages = $\frac{₹9,00,000}{₹15,00,000} \times 100 = 60\%$

2. Percentage of administration overheads to Cost of production

   = $\frac{₹8,40,000}{₹42,00,000} \times 100 = 20\%$

3. Selling and distribution overheads = ₹10,50,000 × 115% = ₹12,07,500

   Selling and distribution overhead % to Cost of production

   = $\frac{₹12,07,500}{₹42,00,000} \times 100 = 28.75\%$

4. Percentage of profit to sales = $\frac{₹12,18,000}{₹73,08,000} \times 100 = 16.67\%$ or, 1/6

(ii) Calculation of price for the job received in 2019-20

	Amount (₹)
Direct materials	4,80,000
Direct wages	3,00,000
Prime Cost	7,80,000
Factory overheads (60% of ₹3,00,000)	1,80,000
Cost of Production	9,60,000
Administration overheads (20% of ₹9,60,000)	1,92,000
Selling and distribution overheads (28.75% of ₹9,60,000)	2,76,000
Cost of Sales	14,28,000
Profit (1/5 of ₹14,28,000)	2,85,600
Sales value	17,13,600

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

Quantities Entering Process	**Litres**	**Quantities Leaving Process**	**Litres**
Opening WIP	1,600	Transfer to Finished Goods	8,400

Raw material input (balancing figure)	8,320	Process Losses	1,200
		Closing WIP	320
	9,920		9,920

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

	Litres
Total process losses for month	1,200
Normal Loss (10% input)	832
Abnormal Loss (balancing figure)	368

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

	Material	Labour	Overheads
Cost per equivalent unit	₹46.00	₹14.00	₹18.00
Equivalent units (litre) (refer the working note)	7,488	7,744	7,872
Cost of equivalent units	₹3,44,448	₹1,08,416	₹1,41,696
Add: Scrap value of normal loss (832 units × ₹15)	₹12,480	--	--
Total value added	₹3,56,928	₹1,08,416	₹1,41,696

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	1,600	Units completed:							
Units introduced	8,320	- Opening WIP	1,600	--	--	480	30	640	40
		- Fresh inputs	6,800	6,800	100	6,800	100	6,800	100
		Normal loss	832	--	--	--	--	--	--
		Abnormal loss	368	368	100	368	100	368	100
		Closing WIP	320	320	100	96	30	64	20
	9,920		9,920	7,488		7,744		7,872	

(iv) Process Account for the month

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	1,600	1,06,560	By Finished goods [8400 x ₹ 78]	8,400	6,55,200
To Raw Materials	8,320	3,56,928	By Normal loss [832 x ₹ 15]	832	12,480
To Wages	--	1,08,416	By Abnormal loss [368 x ₹ 78]	368	28,704
To Overheads	--	1,41,696	By Closing WIP [(320 x ₹ 46) + (320 x .30 x ₹ 14) + (320 x .20 x ₹ 18)]	320	17,216
	9,920	7,13,600		9,920	7,13,600

7. (i) Statement of Expenses of operating bus/ buses for a year

Particulars	Rate (₹)	Per Bus per annum (₹)	Fleet of 5 buses p.a. (₹)
(i) Standing Charges:			
Driver's salary	9,000 p.m.	1,08,000	5,40,000
Cleaner's salary	6,000 p.m.	14,400	72,000
Licence fee, taxes etc.	8,600 p.a.	8,600	43,000
Insurance	10,000 p.a.	10,000	50,000
Depreciation (15,00,000 – 3,00,000) ÷ 12 yrs	1,00,000 p.a.	1,00,000	5,00,000
(ii) Maintenance Charges:			
Repairs & maintenance	35,000 p.a.	35,000	1,75,000
(iii) Operating Charges:			
Diesel (Working Note 1)		2,92,500	14,62,500
Total Cost [(i) + (ii) + (iii)]		5,68,500	28,42,500
Cost per month		47,375	2,36,875
Total no. of equivalent students (Working Note 2)		150	750
Total Cost per half fare equivalent student		₹ 316	₹ 316

(ii) Average cost per student per month:

A. Students coming from distance of upto 5 km. from school

$$= \frac{\text{Total cost per month}}{\text{Total no. of equivalent students}} = \frac{₹47,375}{150 \text{ students}} = ₹\ 316$$

B. Students coming from a distance beyond 4 km. from school

= Cost of per half fare student × 2 = ₹ 316 × 2 = ₹ 632

Working Notes:

1. Calculation of diesel cost per bus:

Distance travelled in a year : (8 round trip × 10 km. × 25 days × 9 months)

Distance travelled p.a. : 18,000 km.

Cost of diesel (per bus p.a.) : $\frac{18,000 \text{ km.}}{4 \text{ kmpl}} \times ₹65 = ₹2,92,500$

2. Calculation of Equivalent number of students per bus:

Seating capacity of a bus	50 students
Half fare students (50% of 50 students)	25 students
Full fare students (50% of 50 students)	25 students
Total number of students equivalent to half fare students	
Full fare students (25 students × 2)	50 students
Add: Half fare students	25 students
Total Equivalent number of students in a trip	75 students
Total number of equivalent students in two trips (Senior + Junior)	150 students

8. Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	90.00	84,600	886 kg.	79,740	900 kg.	81,000	86.00	77,400
B	705 kg.	60.00	42,300	664 kg.	39,840	650 kg.	39,000	65.00	42,250
	1645 kg		1,26,900	1550 kg	1,19,580	1550 kg	1,20,000		1,19,650

WN-1: Standard Quantity (SQ):

Material A- $\left(\frac{800\text{kg.}}{0.9\times1,400\text{kg.}}\times1,480\text{kg.}\right)$ = 939.68 or 940 kg.

Material B- $\left(\frac{600\text{kg.}}{0.9\times1,400\text{kg.}}\times1,480\text{kg.}\right)$ = 704.76 or 705 kg.

WN- 2: Revised Standard Quantity (RSQ):

Material A- $\left(\frac{800\text{kg.}}{1,400\text{kg.}}\times1,550\text{kg.}\right)$ = 885.71 or 886 kg.

Material B- $\left(\frac{600\text{kg.}}{1,400\text{kg.}}\times1,550\text{kg.}\right)$ = 664.28 or 664 kg.

(a) Material Cost Variance (A + B) = {(SQ × SP) – (AQ × AP)}
= {1,26,900 – 1,19,650} = 7,250 (F)

(b) Material Price Variance (A + B) = {(AQ × SP) – (AQ × AP)
= {1,20,000 – 1,19,650} = 350 (F)

(c) Material Mix Variance (A + B) = {(RSQ × SP) – (AQ × SP)}
= {1,19,580 – 1,20,000} = 420 (A)

(d) Material Yield Variance (A + B) = {(SQ × SP) – (RSQ × SP)}
= {1,26,900 – 1,19,580} = 7,320 (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	75.00	83,700	1144	85,800	1,200	90,000	71.00	85,200
Unskilled	893 hrs	44.00	39,292	916	40,304	860	37,840	46.00	39,560
	2,009 hrs		1,22,992	2,060	1,26,104	2,060	1,27,840		1,24,760

WN- 3: Standard Hours (SH):

Skilled labour- $\left(\frac{0.95\times1,000\text{hr.}}{0.90\times1,400\text{kg.}}\times1,480\text{kg.}\right)$ =1,115.87 or 1,116 hrs.

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 or 893 hrs.

WN- 4: Revised Standard Hours (RSH):

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

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

(e) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) – (AH × AR)}
= {1,22,992 – 1,24,760} = 1,768 (A)

(f) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) – (AH × SR)}
= {1,22,992 – 1,27,840} = 4,848 (A)

(g) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) – (RSH × SR)}
= {1,22,992 – 1,26,104} = 3,112 (A)

9. Working Notes:

(1) Calculation of Cost of Goods Sold (COGS):

COGS = DM + DL + FOH + AOH

COGS = {0.3 COGS + 0.15 COGS + (0.10 COGS + ₹ 2,30,000) + (0.02 COGS + ₹ 71,000)}

Or, COGS = 0.57 COGS + ₹ 3,01,000

Or, COGS = $\frac{₹\,3,01,000}{0.43}$ = ₹ 7,00,000

(2) Calculation of Cost of Sales (COS):

COS = COGS + S&DOH

COS = COGS + (0.04 COS + ₹ 68,000)

Or, COS = ₹ 7,00,000 + (0.04 COS + ₹ 68,000)

Or, COS = $\frac{₹\,7,68,000}{0.96}$ = ₹ 8,00,000

(3) Calculation of Variable Costs:

Direct Material-	(0.30 × ₹ 7,00,000)	₹ 2,10,000
Direct Labour-	(0.15 × ₹ 7,00,000)	₹ 1,05,000

Factory Overhead-	(0.10 × ₹ 7,00,000)	₹ 70,000
Administration OH-	(0.02 × ₹ 7,00,000)	₹ 14,000
Selling & Distribution OH	(0.04 × ₹ 8,00,000)	₹ 32,000
		₹ 4,31,000

(4) Calculation of total Fixed Costs:

Factory Overhead-	₹ 2,30,000
Administration OH-	₹ 71,000
Selling & Distribution OH	₹ 68,000
	₹ 3,69,000

(5) Calculation of P/V Ratio:

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}} \times 100$$

$$= \frac{(₹185 \times 5,000 \text{ units}) - ₹\,4,31,000}{₹185 \times 5,000 \text{ units}} \times 100 = 53.41\%$$

(i) Break-Even Sales

$$= \frac{\text{Fixed Costs}}{\text{P/V Ratio}} = \frac{₹\,3,69,000}{53.41\%} = ₹\,6,90,882$$

(ii) Profit earned during the last year

= (Sales – Total Variable Costs) – Total Fixed Costs

= (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 1,25,000

(iii) Margin of Safety (%)

$$= \frac{\text{Sales} - \text{Breakeven sales}}{\text{Sales}} \times 100$$

$$= \frac{₹\,9,25,000 - ₹\,6,90,882}{₹\,9,25,000} \times 100 = 25.31\%$$

(iv) Profit if the sales were 10% less than the actual sales:

Profit = 90% (₹ 9,25,000 - ₹ 4,31,000) - ₹ 3,69,000

= ₹ 4,44,600 - ₹ 3,69,000 = ₹ 75,600

10. (i) Preparation of Production Budget (in units)

	October	November	December	January
Demand for the month (Nos.)	40,000	35,000	45,000	60,000
Add: 20% of next month's demand	7,000	9,000	12,000	13,000
Less: Opening Stock	(9,500)	(7,000)	(9,000)	(12,000)
Vehicles to be produced	37,500	37,000	48,000	61,000

(ii) Preparation of Purchase budget for Part-X

	October	November	December
Production for the month (Nos.)	37,500	37,000	48,000
Add: 40% of next month's production	14,800 (40% of 37,000)	19,200 (40% of 48,000)	24,400 (40% of 61,000)
	52,300	56,200	72,400
No. of units required for production	2,09,200 (52,300 × 4 units)	2,24,800 (56,200 × 4 units)	2,89,600 (72,400 × 4 units)
Less: Opening Stock	(48,000)	(59,200) (14,800 × 4 units)	(76,800) (19,200 × 4 units)
No. of units to be purchased	1,61,200	1,65,600	2,12,800

(iii) Budgeted Gross Profit for the Quarter October to December

	October	November	December	Total
Sales in nos.	40,000	35,000	45,000	1,20,000
Net Selling Price per unit* (₹)	14,57,070	14,57,070	14,57,070	
Sales Revenue (₹ in lakh)	5,82,828	5,09,974.50	6,55,681.50	17,48,484
Less: Cost of Sales (₹ in lakh) (Sales unit × Cost per unit)	4,57,120	3,99,980	5,14,260	13,71,360
Gross Profit (₹ in lakh)	1,25,708	1,09,994.50	1,41,421.50	3,77,124

* Net Selling price unit =₹17,14,200 – 15% commission on ₹17,14,200 = ₹14,57,070.

11. (a) Difference between Cost Accounting and Management Accounting

	Basis	Cost Accounting	Management Accounting
(i)	Nature	It records the quantitative aspect only.	It records both qualitative and quantitative aspect.
(ii)	Objective	It records the cost of producing a product and providing a service.	It Provides information to management for planning and co-ordination.
(iii)	Area	It only deals with cost Ascertainment.	It is wider in scope as it includes financial accounting, budgeting, taxation, planning etc.
(iv)	Recording of data	It uses both past and present figures.	It is focused with the projection of figures for future.
(v)	Development	Its development is related to industrial revolution.	It develops in accordance to the need of modern business world.
(vi)	Rules and Regulation	It follows certain principles and procedures for recording costs of different products.	It does not follow any specific rules and regulations.

(b) The impact of IT in cost accounting system may include the following:

(i) After the introduction of ERPs, different functional activities get integrated and as a consequence a single entry into the accounting system provides custom made reports for every purpose and saves an organisation from preparing different sets of documents. Reconciliation process of results of both cost and financial accounting systems become simpler and less sophisticated.

(ii) A move towards paperless environment can be seen where documents like Bill of Material, Material Requisition Note, Goods Received Note, labour utilisation report etc. are no longer required to be prepared in multiple copies, the related department can get e-copy from the system.

(iii) Information Technology with the help of internet (including intranet and extranet) helps in resource procurement and mobilisation. For example, production department can get materials from the stores without issuing material requisition note physically. Similarly, purchase orders can be initiated to the suppliers with the help of extranet. This enables an entity to shift towards Just-in-Time (JIT) approach of inventory management and production.

(iv) Cost information for a cost centre or cost object is ascertained with accuracy in timely manner. Each cost centre and cost object is codified and all related costs are assigned to the cost object or cost centre. This process automates the cost accumulation and ascertainment process. The cost information can be customised as per the requirement. For example, when an entity manufacture or provide services, it can know information job-wise, batch-wise, process-wise, cost centre wise etc.

(v) Uniformity in preparation of report, budgets and standards can be achieved with the help of IT. ERP software plays an important role in bringing uniformity irrespective of location, currency, language and regulations.

(vi) Cost and revenue variance reports are generated in real time basis which enables the management to take control measures immediately.

(vii) IT enables an entity to monitor and analyse each process of manufacturing or service activity closely to eliminate non value added activities.

The above are examples of few areas where Cost Accounting is done with the help of IT.

(c) **Escalation clause** in a contract empowers a contractor to revise the price of the contract in case of increase in the prices of inputs due to some macro-economic or other agreed reasons. A contract takes longer period to complete and the factors based on which price negotiation is done at the time of entering into the contract may change till the contract completes. This protect the contractor from adverse financial impacts and empowers the contractor to recover the increased prices. As per this clause, the contractor increases the contract price if the cost of materials, employees and other expenses increase beyond a certain limit. Inclusion of such a clause in a contract deed is called an "Escalation Clause".

(d) **By-product cost can be dealt in cost accounting in the following ways:**

(i) **When they are of small total value:** When the by-products are of small total value, the amount realised from their sale may be dealt in any one the following two ways:

1. The sales value of the by-products may be credited to the Costing Profit and Loss Account and no credit be given in the Cost Accounts. The credit to the Costing Profit and Loss Account here is treated either as miscellaneous income or as additional sales revenue.

2. The sale proceeds of the by-product may be treated as deductions from the total costs. The sale proceeds in fact should be deducted either from the production cost or from the cost of sales.

(ii) **When the by-products are of considerable total value:** Where by-products are of considerable total value, they may be regarded as joint products rather

than as by-products. To determine exact cost of by-products the costs incurred upto the point of separation, should be apportioned over by-products and joint products by using a logical basis. In this case, the joint costs may be divided over joint products and by-products by using relative market values; physical output method (at the point of split off) or ultimate selling prices (if sold).

(iii) Where they require further processing: In this case, the net realisable value of the by-product at the split-off point may be arrived at by subtracting the further processing cost from the realisable value of by-products.

If total sales value of by-products at split-off point is small, it may be treated as per the provisions discussed above under (*i*).

In the contrary case, the amount realised from the sale of by-products will be considerable and thus it may be treated as discussed under (*ii*).

PART-II: FINANCIAL MANAGEMENT

QUESTIONS

Time Value of Money

1. A company offers a fixed deposit scheme whereby ₹ 10,000 matures to ₹ 12,625 after 2 years, on a half-yearly compounding basis. If the company wishes to amend the scheme by compounding interest every quarter, what will be the revised maturity value?

Ratio Analysis

2. MT Limited has the following Balance Sheet as on March 31, 2019 and March 31, 2020:

Balance Sheet

	₹ in lakhs	
	March 31, 2019	**March 31, 2020**
Sources of Funds:		
Shareholders' Funds	2,500	2,500
Loan Funds	3,500	3,000
	6,000	5,500
Applications of Funds:		
Fixed Assets	3,500	3,000
Cash and bank	450	400
Receivables	1,400	1,100
Inventories	2,500	2,000
Other Current Assets	1,500	1,000
Less: Current Liabilities	(1,850)	(2,000)
	6,000	5,500

The Income Statement of the MT Ltd. for the year ended is as follows:

	₹ in lakhs	
	March 31, 2019	**March 31, 2020**
Sales	22,500	23,800
Less: Cost of Goods sold	(20,860)	(21,100)
Gross Profit	1,640	2,700
Less: Selling, General and Administrative expenses	(1,100)	(1,750)
Earnings before Interest and Tax (EBIT)	540	950

Less: Interest Expense	(350)	(300)
Earnings before Tax (EBT)	190	650
Less: Tax	(57)	(195)
Profits after Tax (PAT)	133	455

Required:

Calculate for the year 2019-20:

(a) Inventory turnover ratio

(b) Financial Leverage

(c) Return on Capital Employed (ROCE)

(d) Return on Equity (ROE)

(e) Average Collection period.

[Take 1 year = 365 days]

Cost of Capital

3. PK Ltd. has the following book-value capital structure as on March 31, 2020.

	(₹)
Equity share capital (10,00,000 shares)	2,00,00,000
11.5% Preference shares	60,00,000
10% Debentures	1,00,00,000
	3,60,00,000

The equity shares of the company are sold for ₹ 200. It is expected that the company will pay next year a dividend of ₹ 10 per equity share, which is expected to grow by 5% p.a. forever. Assume a 35% corporate tax rate.

Required:

(i) Compute weighted average cost of capital (WACC) of the company based on the existing capital structure.

(ii) Compute the new WACC, if the company raises an additional ₹50 lakhs debt by issuing 12% debentures. This would result in increasing the expected equity dividend to ₹12.40 and leave the growth rate unchanged, but the price of equity share will fall to ₹ 160 per share.

Capital Structure Decisions

4. Calculate the level of earnings before interest and tax (EBIT) at which the EPS indifference point between the following financing alternatives will occur.

   (i) Equity share capital of ₹60,00,000 and 12% debentures of ₹40,00,000.

   Or

   (ii) Equity share capital of ₹40,00,000, 14% preference share capital of ₹20,00,000 and 12% debentures of ₹40,00,000.

   Assume the corporate tax rate is 35% and par value of equity share is ₹100 in each case.

Leverage

5. A firm has sales of ₹ 85,00,000, variable cost is 56% and fixed cost is ₹ 20,00,000. It has a debt of ₹ 45,00,000 at 12% and equity of ₹ 55,00,000. You are required to interpret the following:

   (i) The firm's ROI?

   (ii) Does it have favourable financial leverage?

   (iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?

   (iv) The operating, financial and combined leverages of the firm?

   (v) If the sales is increased by 10%, by what percentage will EBIT increase?

   (vi) At what level of sales, the EBT of the firm will be equal to zero?

   (vii) If EBIT increases by 20%, by what percentage will EBT increase?

Capital Budgeting

6. A company is considering the proposal of taking up a new project which requires an investment of ₹800 lakhs on machinery and other assets. The project is expected to yield the following earnings (before depreciation and taxes) over the next five years:

Year	Earnings (₹ in lakhs)
1	320
2	320
3	360
4	360
5	300

The cost of raising the additional capital is 12% and assets have to be depreciated at 20% on written down value basis. The scrap value at the end of the five year period may be taken as zero. Income-tax applicable to the company is 40%.

You are required to calculate the net present value of the project and advise the management to take appropriate decision. Also calculate the Internal Rate of Return of the Project.

Note: Present values of Re. 1 at different rates of interest are as follows:

Year	10%	12%	14%	16%	20%
1	0.91	0.89	0.88	0.86	0.83
2	0.83	0.80	0.77	0.74	0.69
3	0.75	0.71	0.67	0.64	0.58
4	0.68	0.64	0.59	0.55	0.48
5	0.62	0.57	0.52	0.48	0.40

Management of Receivables (Debtors)

7. TM Limited, a manufacturer of colour TV sets is considering the liberalization of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be sold to the customers in addition to other sales are as follows:

Quantity sold (No. of TV Sets)

Credit Period (Days)	A	B	C
0	10,000	10,000	-
30	10,000	15,000	-
60	10,000	20,000	10,000
90	10,000	25,000	15,000

The selling price per TV set is ₹15,000. The expected contribution is 50% of the selling price. The cost of carrying receivable averages 20% per annum.

You are required to compute the credit period to be allowed to each customer.

(Assume 360 days in a year for calculation purposes).

Management of Working Capital

8. Day Ltd., a newly formed company has applied to the Private Bank for the first time for financing it's Working Capital Requirements. The following information is available about the projections for the current year:

Estimated Level of Activity	Completed Units of Production 31,200 plus unit of work in progress 12,000
Raw Material Cost	₹ 40 per unit
Direct Wages Cost	₹ 15 per unit
Overhead	₹ 40 per unit (inclusive of Depreciation ₹10 per unit)
Selling Price	₹ 130 per unit
Raw Material in Stock	Average 30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods Stock	24,000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages (Lag in payment)	15 days
Expected Cash Balance	₹ 2,00,000

Assume that production is carried on evenly throughout the year (360 days) and wages and overheads accrue similarly. All sales are on the credit basis. You are required to calculate the Net Working Capital Requirement on Cash Cost Basis.

Cash Flow Statement

9. Balance Sheet of Jungle Limited as on 31st March, 2019 and 31st March, 2020 are furnished below:

(Amount in Rupees)

Liabilities	**As at 31st March, 2019**	**As at 31st March, 2020**
Equity Share Capital	75,00,000	1,02,50,000
General Reserve	42,50,000	50,00,000
Profit & Loss Account	15,00,000	18,75,000
13 % Debentures of face value ₹ 100 each	58,00,000	43,50,000
Current Liabilities	30,00,000	32,50,000
Proposed Dividend	7,50,000	9,10,000
Provision for Income tax	22,50,000	24,75,000
Total	2,50,50,000	2,81,10,000

(Amount in Rupees)

Assets	As at 31st March, 2019	As at 31st March, 2020
Goodwill	10,00,000	7,75,000
Land & Building	68,00,000	61,20,000
Plant & Machinery	75,12,000	1,07,95,000
Investment	25,00,000	21,25,000
Stock	33,00,000	27,50,000
Debtors	24,45,000	36,20,000
Cash and Bank	14,93,000	19,25,000
Total	2,50,50,000	2,81,10,000

Following additional information is available:

(i) During the financial year 2019-20 the company issued equity shares at par.

(ii) Debentures were redeemed on 1st April, 2019 at a premium of 10%.

(iii) Some investments were sold at a profit of ₹ 75,000 and the profit was credited to General Reserve Account.

(iv) During the year an old machine costing ₹ 23,50,000 was sold for ₹ 6,25,000. Its written down value was ₹ 8,00,000.

(v) Depreciation is to be provided on plant and machinery at 20% on the opening balance.

(vi) There was no purchase or sale of land and building.

(vii) Provision for tax made during the year was ₹ 4,50,000.

You are required to prepare a Cash Flow Statement for the year ended 31st March 2020.

Miscellaneous

10. (i) "The profit maximization is not an operationally feasible criterion." Identify.

(ii) Explain the basics of debt securitisation process.

SUGGESTED HINTS/ANSWERS

1. Computation of Rate of Interest and Revised Maturity Value

Principal = ₹ 10,000

Amount = ₹ 12,625

$$₹\ 10,000 = \frac{₹12,625}{(1+i)^4}$$

$P_n = A \times (PVF_{n,i})$

$₹\ 10,000 = 12,625\ (PVF_{4,i})$

$0.7921 = (PVF_{4,i})$

According to the Table on Present Value Factor ($PVF_{4,i}$) of a lump sum of ₹1, a PVF of 0.7921 for half year at interest (i) = 6 percent. Therefore, the annual interest rate is 2 × 0.06 = 12 percent.

I = 6% for half year

I = 12% for full year.

Therefore, Rate of Interest = 12% per annum

Revised Maturity Value $= ₹\,10,000\left(1+\frac{12}{100}\times\frac{1}{4}\right)^{2\times4} = 10,000\left(1+\frac{3}{100}\right)^{8} = 10,000\ (1.03)^8$

$= ₹\ 10,000 \times 1.267$ [Considering $(CVF_{8,3}) = 1.267$]

Revised Maturity Value = ₹ 12,670

2. Ratios for the year 2019-2020

(a) Inventory turnover ratio

$$= \frac{\text{COGS}}{\text{Average Inventory}} = \frac{₹21,100}{\frac{₹(2,500 + 2,000)}{2}} = 9.4$$

(b) Financial leverage

$$= \frac{\text{EBIT}}{\text{EBT}} = \frac{₹\,950}{₹\,650} = 1.46$$

(c) ROCE

$$= \frac{\text{EBIT}\,(1-t)}{\text{Average Capital Employed}} = \frac{₹\,950\,(1-0.3)}{₹\left(\frac{6,000+5,500}{2}\right)} = \frac{₹\,665}{₹\,5,750}\times100 = 11.56\ \%$$

[Here, Return on Capital Employed (ROCE) is calculated after Tax]

(d) ROE

$$= \frac{\text{Profits after tax}}{\text{Average shareholders' funds}} = \frac{₹\,455}{₹\,2,500}\times100 = 18.2\%$$

(e) Average Collection Period

$$\text{Average Sales per day} = \frac{₹\ 23,800}{365} = ₹\ 65.20 \text{ lakhs}$$

$$\text{Average collection period} = \frac{\text{Average Receivables}}{\text{Average sales per day}}$$

$$= \frac{\frac{₹\ (1,400 + 1,100)}{2}}{₹\ 65.2} = \frac{₹\ 1,250}{₹\ 65.2} = 19.17 \text{days}$$

3. (i) Computation of Weighted Average Cost of Capital based on existing capital structure

Source of Capital	Existing Capital structure (₹)	Weights (a)	After tax cost of capital (%) (b)	WACC (%) (a) × (b)
Equity share capital (W.N.1)	2,00,00,000	0.555	10.00	5.55
11.5% Preference share capital	60,00,000	0.167	11.50	1.92
10% Debentures (W.N.2)	1,00,00,000	0.278	6.50	1.81
	3,60,00,000	1.000		9.28

Working Notes (W.N.):

1. Cost of equity capital:

$$K_e = \frac{\text{Expected Dividend}(D_1)}{\text{Current Market Price per share}(P_0)} + \text{Growth}(g) = \frac{₹10}{₹200} + 0.05 = 10\%$$

2. Cost of 10% Debentures:

$$= \frac{I(1-t)}{NP} = \frac{₹10,00,000(1-0.35)}{₹1,00,00,000} = 0.065 \text{ or } 6.5\%$$

(ii) Computation of Weighted Average Cost of Capital based on new capital structure

Source of Capital	New Capital structure (₹)	Weights (b)	After tax cost of capital (%) (a)	WACC (%) (a) × (b)
Equity share capital (W.N. 3)	2,00,00,000	0.488	12.75	6.10
Preference share	60,00,000	0.146	11.50	1.68

10% Debentures (W.N. 2)	1,00,00,000	0.244	6.50	1.59
12% Debentures (W.N.4)	50,00,000	0.122	7.80	0.95
	4,10,00,000	1.00		10.32

Working Notes (W.N.):

3. Cost of equity capital:

$$K_e = \frac{\text{Expected Dividend}(D_1)}{\text{Current Market Price per share}(P_0)} + \text{Growth}(g)$$

$$= \frac{₹12.4}{₹160} + 0.05 = 0.1275 \text{ or } 12.75\%$$

4. Cost of 12% Debentures

$$= \frac{₹6,00,000(1-0.35)}{₹50,00,000} = 0.078 \text{ or } 7.8\%$$

$$K_d = \frac{₹2,40,000(1-0.35)}{₹20,00,000} = 0.078 \text{ or } 7.8\%$$

4. Computation of level of earnings before interest and tax (EBIT)

In case, alternative (i) is accepted, then the EPS of the firm would be:

$$EPS_{\text{Alternative (i)}} = \frac{(EBIT - \text{Interest})\ (1-\text{tax rate})}{\text{No. of equity shares}}$$

$$= \frac{(EBIT - 0.12 \times ₹40,00,000)\ (1-0.35)}{60,000 \text{ shares}}$$

In case, alternative (ii) is accepted, then the EPS of the firm would be:

$$EPS_{\text{Alternative (ii)}} = \frac{(EBIT - 0.12 \times ₹40,00,000)(1-0.35) - (0.14 \times ₹20,00,000)}{40,000 \text{ shares}}$$

In order to determine the indifference level of EBIT, the EPS under the two alternative plans should be equated as follows:

$$\frac{(EBIT - 0.12 \times ₹40,00,000)(1-0.35)}{60,000 \text{ shares}} = \frac{(EBIT - 0.12 \times ₹40,00,000)(1-0.35) - (0.14 \times ₹20,00,000)}{40,000 \text{ shares}}$$

$$\text{Or} \quad \frac{0.65\ EBIT - ₹3,12,000}{3} = \frac{0.65\ EBIT - ₹5,92,000}{2}$$

$$\text{Or} \quad 1.30\ EBIT - ₹6,24,000 = 1.95\ EBIT - ₹17,76,000$$

$$\text{Or} \quad (1.95 - 1.30)\ EBIT = ₹17,76,000 - ₹6,24,000 = ₹11,52,000$$

Or EBIT = $\frac{₹11,52,000}{0.65}$

Or EBIT = ₹17,72,308

5. Income Statement

Particulars	Amount (₹)
Sales	85,00,000
Less: Variable cost (56% of ₹85,00,000)	(47,60,000)
Contribution	37,40,000
Less: Fixed costs	(20,00,000)
Earnings before interest and tax (EBIT)	17,40,000
Less: Interest on debt (@ 12% on ₹45 lakh)	(5,40,000)
Earnings before tax (EBT)	12,00,000

(i) $ROI = \frac{EBIT}{Capital\ employed} \times 100 = \frac{EBIT}{Equity + Debt} \times 100$

$= \frac{17,40,000}{55,00,000 + 45,00,000} \times 100 = 17.4\%$

(ROI is calculated on Capital Employed)

(ii) ROI = 17.4% and Interest on debt is 12%, hence, it has a favourable financial leverage.

(iii) Capital Turnover $= \frac{Net\ Sales}{Capital}$

Or, $= \frac{Net\ Sales}{Capital} = \frac{85,00,000}{1,00,00,000} = 0.85$

Which is very low as compared to industry average of 3.

(iv) Calculation of Operating, Financial and Combined leverages

(a) Operating Leverage $= \frac{Contribution}{EBIT} = \frac{37,40,000}{17,40,000} = 2.15$

(b) Financial Leverage $= \frac{EBIT}{EBT} = \frac{17,40,000}{12,00,000} = 1.45$

(c) Combined Leverage $= \frac{Contribution}{EBT} = \frac{37,40,000}{12,00,000} = 3.12$

Or, = Operating Leverage × Financial Leverage = 2.15 × 1.45 = 3.12

(v) Operating leverage is 2.15. So if sales is increased by 10%. EBIT will be increased by 2.15 × 10 i.e. 21.50% (approx.)

(vi) Since the combined Leverage is 3.12, sales have to drop by 100/3.12 i.e. 32.05% to bring EBT to Zero

Accordingly, New Sales = ₹85,00,000 × (1-0.3205)

=₹85,00,000 × 0.6795 = ₹57,75,750

Hence at ₹57,75,750 sales level, EBT of the firm will be equal to Zero.

(vii) Financial leverage is 1.45. So, if EBIT increases by 20% then EBT will increase by 1.45 × 20 = 29%

6. (i) Calculation of Net Cash Flow

					(₹ in lakhs)
Year	**Profit before dep. and tax**	**Depreciation (20% on WDV)**	**PBT**	**PAT**	**Net cash flow**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(3) + (5)**
1	320	800 × 20% = 160	160	96	256
2	320	(800 – 160)× 20% = 128	192	115.20	243.20
3	360	(640 – 128)× 20% = 102.4	257.6	154.56	256.96
4	360	(512 – 102.4)× 20% = 81.92	278.08	166.85	248.77
5	300	(409.6 – 81.92) = 327.68*	–27.68	–16.61	311.07

*this is treated as a short term capital loss.

(ii) Calculation of Net Present Value (NPV)

(₹ in lakhs)

Year	Net Cash Flow	12%		16%		20%	
		D.F	P.V	D.F	P.V	D.F	P.V
1	256	0.89	227.84	0.86	220.16	0.83	212.48
2	243.20	0.80	194.56	0.74	179.97	0.69	167.81
3	256.96	0.71	182.44	0.64	164.45	0.58	149.03
4	248.77	0.64	159.21	0.55	136.82	0.48	119.41
5	311.07	0.57	177.31	0.48	149.31	0.40	124.43
			941.36		850.71		773.16
	Less: Initial Investment		800.00		800.00		800.00
		NPV	141.36		50.71		-26.84

(iii) Advise: Since Net Present Value of the project at 12% = 141.36 lakhs, therefore the project should be implemented.

(iv) Calculation of Internal Rate of Return (IRR)

$$IRR = 16\% + \frac{50.71 \times 4}{50.71 - (-26.84)}$$

$$= 16\% + \frac{2.03}{77.55} = 16\% + 2.62\% = 18.62\%.$$

7. In case of customer A, there is no increase in sales even if the credit is given. Hence comparative statement for B & C is given below:

Particulars	**Customer B**				**Customer C**			
1. Credit period (days)	0	30	60	90	0	30	60	90
2. Sales Units	10,000	15,000	20,000	25,000	-	-	10,000	15,000
	₹ in lakh				**₹in lakh**			
3. Sales Value	1,500	2,250	3,000	3,750	-	-	1,500	2,250
4. Contribution at 50% (A)	750	1,125	1,500	1,875	-	-	750	1,125
5. Receivables:- $\frac{\text{Credit Period} \times \text{Sales}}{360}$	-	187.5	500	937.5	-	-	250	562.5
6. Debtors at cost	-	93.75	250	468.75	-	-	125	281.25
7. Cost of carrying debtors at 20% (B)	-	18.75	50	93.75	-	-	25	56.25
8. Excess of contributions over cost of carrying debtors (A – B)	750	1,106.25	1,406.25	1,781.25	-	-	725	1,068.75

The excess of contribution over cost of carrying Debtors is highest in case of credit period of 90 days in respect of both the customers B and C. Hence, credit period of 90 days should be allowed to B and C.

8. Calculation of Net Working Capital requirement:

	(₹)	**(₹)**
A. Current Assets:		
Inventories:		
Stock of Raw material (Refer to Working note (iii)	1,44,000	

Stock of Work in progress (Refer to Working note (ii)	7,50,000	
Stock of Finished goods (Refer to Working note (iv)	20,40,000	
Debtors for Sales (Refer to Working note (v)	1,02,000	
Cash	2,00,000	
Gross Working Capital	32,36,000	32,36,000
B. Current Liabilities:		
Creditors for Purchases (Refer to Working note (vi)	1,56,000	
Creditors for wages (Refer to Working note (vii)	23,250	
	1,79,250	1,79,250
Net Working Capital (A - B)		**30,56,750**

Working Notes:

(i) Annual cost of production

	(₹)
Raw material requirements {(31,200 × ₹ 40) + (12,000 x ₹ 40)}	17,28,000
Direct wages {(31,200 ×₹ 15) +(12,000 X ₹ 15 x 0.5)}	5,58,000
Overheads (exclusive of depreciation) {(31,200 × ₹ 30) + (12,000 x ₹ 30 x 0.5)}	11,16,000
Gross Factory Cost	34,02,000
Less: Closing W.I.P [12,000 (₹ 40 + ₹ 7.5 + ₹15)]	(7,50,000)
Cost of Goods Produced	26,52,000
Less: Closing Stock of Finished Goods (₹ 26,52,000 × 24,000/31,200)	(20,40,000)
Total Cash Cost of Sales*	6,12,000

[*Note: Alternatively, Total Cash Cost of Sales = (31,200 units – 24,000 units) x (₹ 40 + ₹ 15 + ₹ 30) = ₹ 6,12,000]

(ii) Work in progress stock

	(₹)
Raw material requirements (12,000 units × ₹40)	4,80,000
Direct wages (50% × 12,000 units × ₹ 15)	90,000
Overheads (50% × 12,000 units × ₹ 30)	1,80,000
	7,50,000

(iii) Raw material stock

It is given that raw material in stock is average 30 days consumption. Since, the company is newly formed; the raw material requirement for production and work in progress will be issued and consumed during the year. Hence, the raw material consumption for the year (360 days) is as follows:

	(₹)
For Finished goods (31,200 × ₹ 40)	12,48,000
For Work in progress (12,000 × ₹ 40)	4,80,000
	17,28,000

$$\text{Raw material stock} = \frac{₹17,28,000}{360\,\text{days}} \times 30\,\text{days} = ₹1,44,000$$

(iv) Finished goods stock:

24,000 units @ ₹ (40+15+30) per unit = ₹20,40,000

(v) Debtors for sale: $₹\,6,12,000 \times \frac{60\,\text{days}}{360\,\text{days}} = ₹\,1,02,000$

(vi) Creditors for raw material Purchases [Working Note (iii)]:

Annual Material Consumed (₹12,48,000 + ₹4,80,000)	₹17,28,000
Add: Closing stock of raw material [(₹17,28,000 x 30 days) / 360 days]	₹ 1,44,000
	₹18,72,000

$$\text{Credit allowed by suppliers} = \frac{₹18,72,000}{360\,\text{days}} \times 30\,\text{days} = ₹\ 1,56,000$$

(vii) Creditors for wages:

Outstanding wage payment = [(31,200 units x ₹ 15) + (12,000 units x ₹ 15 x .50)] x 15 days / 360 days

$$= \frac{₹5,58,000}{360\,\text{days}} \times 15\,\text{days} = ₹\ 23,250$$

9. Cash Flow Statement
for the year ended 31st March, 2020

	Amount (₹)	Amount (₹)
A. Cash flow from Operating Activities		
Profit and Loss A/c (Closing)		18,75,000
Less: Profit and Loss A/c (Opening)		15,00,000

			3,75,000
	Add: Transfer to General Reserve	6,75,000	
	Provision for Tax	4,50,000	
	Proposed Dividend	9,10,000	20,35,000
	Profit before Tax		24,10,000
	Adjustment for Depreciation:		
	Land and Building (on building) (₹ 68,00,000 - ₹ 61,20,000)	6,80,000	
	Plant and Machinery (₹ 75,12,000 x 20%)	15,02,400	21,82,400
	Loss on Sale of Plant and Machinery (₹ 8,00,000 - ₹ 6,25,000)		1,75,000
	Goodwill written off (₹ 10,00,000 - ₹ 7,75,000)		2,25,000
	Interest on 13% Debentures (₹ 43,50,000 x13%)		5,65,500
	Premium on Redemption [10% of (₹ 58,00,000 - ₹ 43,50,000)]		1,45,000
	Operating Profit before Working Capital Changes		57,02,900
	Adjustment for Working Capital Changes:		
	Decrease in Stock	5,50,000	
	Increase in Debtors	(11,75,000)	
	Increase in Current Liabilities	2,50,000	(3,75,000)
	Cash generated from Operations		53,27,900
	Income tax paid		(225,000)
	Net Cash Inflow from Operating Activities (a)		51,02,900
B.	**Cash flow from Investing Activities**		
	Sale of Investment		4,50,000
	Sale of Plant and Machinery		6,25,000
	Purchase of Plant and Machinery		(55,85,400)
	Net Cash Outflow from Investing Activities (b)		(45,10,400)
C.	**Cash Flow from Financing Activities**		
	Issue of Equity Shares (₹ 1,02,50,000 - ₹ 75,00,000)		27,50,000

Redemption of Debentures		(14,50,000)
Redemption of Debentures at premium		(1,45,000)
Dividend paid		(7,50,000)
Interest paid to Debenture holders		(5,65,500)
Net Cash Outflow from Financing Activities (c)		(1,60,500)
Net increase in Cash and Cash Equivalents during the year **(a + b + c)**		4,32,000
Cash and Cash Equivalents at the beginning of the year		14,93,000
Cash and Cash Equivalents at the end of the year		19,25,000

Working Notes:

1. **Provision for the Tax Account**

Particulars	₹	Particulars	₹
To Bank (paid) (bal. fig.)	2,25,000	By Balance b/d	22,50,000
To Balance c/d	24,75,000	By Profit and Loss A/c (Provision)	4,50,000
	27,00,000		27,00,000

2. **Investment Account**

Particulars	₹	Particulars	₹
To Balance b/d	25,00,000	By Bank A/c (Sale) (bal. fig.)	4,50,000
To General Reserve A/c (Profit on Sale)	75,000	By Balance c/d	21,25,000
	25,75,000		25,75,000

3. **Plant and Machinery Account**

Particulars	₹	Particulars	₹
To Balance b/d	75,12,000	By Bank (Sale)	6,25,000
To Bank A/c (Purchase- Bal. figure)	55,85,400	By Profit and Loss A/c (Loss on sale)	1,75,000
		By Profit and Loss A/c (Depreciation)	15,02,400
		By Balance c/d	1,07,95,000
	1,30,97,400		1,30,97,400

4. **Proposed Dividend Account**

	Particulars	₹		Particulars	₹
To	Bank (paid)	7,50,000	By	Balance b/d	7,50,000
To	Balance c/d	9,10,000	By	Profit and Loss A/c	9,10,000
		16,60,000			16,60,000

5. **General Reserve Account**

	Particulars	₹		Particulars	₹
			By	Balance b/d	42,50,000
			By	Profit & Loss (transfer from) (bal. fig.)	6,75,000
To	Balance c/d	50,00,000	By	Investment (Gain on Sale)	75,000
		50,00,000			50,00,000

10. (i) 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:

(a) 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?

(b) 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.

(c) It ignores the risk factor.

(d) The term maximization is also vague.

(ii) Process of Debt Securitisation:

(a) *The origination function* – A borrower seeks a loan from a finance company or a bank. The credit worthiness of borrower is evaluated and contract is entered into with repayment schedule structured over the life of the loan.

(b) *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.

(c) *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.

The process of securitization is generally without recourse i.e. investors bear the credit risk and issuer is under an obligation to pay to investors only if the cash flows are received by him from the collateral. The benefits to the originator are that assets are shifted off the balance sheet, thus giving the originator recourse to off-balance sheet funding.