PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I: COST ACCOUNTING

QUESTIONS

Material

1. A Ltd. produces a product 'X' using a raw material 'D'. To produce one unit of X, 4 kg of D is required. As per the sales forecast conducted by the company, it will be able to sale 20,000 units of X in the coming year.

   The following are the information related to the raw material D:

   (i) The Re-order quantity is 400 kg. less than the Economic Order Quantity (EOQ).

   (ii) Maximum consumption per day is 40 kg. more than the average consumption per day.

   (iii) There is an opening stock of 2,000 kg.

   (iv) Time required to get the raw materials from the suppliers is 4 to 8 days.

   (v) The purchase price is ₹ 250 per kg.

   There is an opening stock of 1,800 units of the finished product X.

   The carrying cost of inventory is 14% p.a.

   To place an order company has to incur ₹ 1,340 on paper and documentation work.

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

   (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 300 days for a year]

Labour

2. JBL Sisters operates a boutique which works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 8 hours for boutique work on a piece of garment. In the month of December 2020, two workers M and J were given 15 pieces and 21 pieces of garments respectively for boutique work. The following are the details of their work:

	M	J
Work assigned	15 pcs.	21 pcs.
Time taken	100 hours	140 hours

Workers are paid bonus as per Halsey System. The existing rate of wages is ₹ 60 per hour. As per the new wages agreement, the workers will be paid ₹ 72 per hour w.e.f. 1st January 2021. At the end of the month December 2020, the accountant of the company has wrongly calculated wages of these two workers taking ₹ 72 per hour.

Required:

(i) Calculate the loss incurred due to incorrect rate selection.

(ii) Calculate the loss incurred due to incorrect rate selection, had Rowan scheme of bonus payment followed.

(iii) Calculate the loss/ savings if Rowan scheme of bonus payment had followed.

(iv) Discuss the suitability of Rowan scheme of bonus payment for JBL Sisters?

Overheads

3. A manufacturing unit has purchased and installed a new machine at a cost of ₹ 24,90,000 to its fleet of 5 existing machines. The new machine has an estimated life of 12 years and is expected to realise ₹ 90,000 as scrap value at the end of its working life.

Other relevant data are as follows:

(i) Budgeted working hours are 2,496 based on 8 hours per day for 312 days. Plant maintenance work is carried out on weekends when production is totally halted. The estimated maintenance hours are 416. During the production hours machine set-up and change over works are carried out. During the set-up hours no production is done. A total 312 hours are required for machine set-ups and change overs.

(ii) An estimated cost of maintenance of the machine is ₹ 2,40,000 p.a.

(iii) The machine requires a component to be replaced every week at a cost of ₹ 2,400.

(iv) There are three operators to control the operations of all the 6 machines. Each operator is paid ₹ 30,000 per month plus 20% fringe benefits.

(v) Electricity: During the production hours including set-up hours, the machine consumes 60 units per hour. During the maintenance the machine consumes only 10 units per hour. Rate of electricity per unit of consumption is ₹ 6.

(vi) Departmental and general works overhead allocated to the operation during last year was ₹ 5,00,000. During the current year it is estimated to increase by 10%.

Required:

Compute the machine hour rate.

Non-Integrated Accounts

4. The financial books of a company reveal the following data for the year ended 31st March, 2020:

	(₹)
Opening Stock:	
Finished goods 625 units	1,06,250
Work-in-process	92,000
01.04.2019 to 31.03.2020	
Raw materials consumed	16,80,000
Direct Labour	12,20,000
Factory overheads	8,44,000
Administration overheads (production related)	3,96,000
Dividend paid	2,44,000
Bad Debts	36,000
Selling and Distribution Overheads	1,44,000
Interest received	76,000
Rent received	92,000
Sales 12,615 units	45,60,000
Closing Stock: Finished goods 415 units	91,300
Work-in-process	82,400

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹ 6 per unit sold.
- Opening Stock of finished goods is valued at ₹ 240 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit Reporting.

Required:

(i) Prepare statements for the year ended 31st March, 2020 showing:
   - the profit as per financial records
   - the profit as per costing records.

(ii) Prepare a statement reconciling the profit as per costing records with the profit as per financial records.

Job Costing

5. SM Motors Ltd. is a manufacturer of auto components. Following are the details of expenses for the year 2019-20:

		(₹)
(i)	Opening Stock of Material	15,00,000
(ii)	Closing Stock of Material	20,00,000
(iii)	Purchase of Material	1,80,50,000
(iv)	Direct Labour	90,50,000
(v)	Factory Overhead	30,80,000
(vi)	Administrative Overhead	20,50,400

During the FY 2020-21, the company has received an order from a car manufacturer where it estimates that the cost of material and labour will be ₹ 80,00,000 and ₹ 40,50,000 respectively. The company charges factory overhead as a percentage of direct labour and administrative overheads as a percentage of factory cost based on previous year's cost.

Cost of delivery of the components at customer's premises is estimated at ₹ 4,50,000.

You are required to:

(i) Calculate the overhead recovery rates based on actual costs for 2019-20.

(ii) Prepare a Job cost sheet for the order received and the price to be quoted if the desired profit is 25% on sales.

Process Costing

6. A company produces a component, which passes through two processes. During the month of November, 2020, materials for 40,000 components were put into Process- I of which 30,000 were completed and transferred to Process- II. Those not transferred to Process- II were 100% complete as to materials cost and 50% complete as to labour and overheads cost. The Process- I costs incurred were as follows:

Direct Materials	₹ 3,00,000
Direct Wages	₹ 3,50,000
Factory Overheads	₹ 2,45,000

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to materials and 25% complete as regard to wages and overheads.

Costs incurred in Process-II are as follows:

Packing Materials	₹ 80,000
Direct Wages	₹ 71,125
Factory Overheads	₹ 85,350

Packing material cost is incurred at the end of the second process as protective packing to the completed units of production.

Required:

(i) Prepare Statement of Equivalent Production, Cost per unit and Process I A/c.

(ii) Prepare statement of Equivalent Production, Cost per unit and Process II A/c.

Operating Costing

7. VPS is a public school having 25 buses each plying in different directions for the transport of its school students. In view of large 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 workload 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 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 8 km. The school works 22 days in a month and remains closed for vacation in May and June. The bus fee, however, is payable by the students for all the 12 months in a year.

The details of expenses for a year are as under:

Driver's salary – payable for all the 12 in months	₹ 12,000 per month per driver
Cleaner's salary payable for all the 12 months	₹ 8,000 per month per cleaner
License fees, taxes etc.	₹ 8,400 per bus per annum
Insurance Premium	₹ 15,600 per bus per annum
Repairs and Maintenance	₹ 20,500 per bus per annum
Purchase price of the bus	₹ 20,00,000 each
Life of the bus	16 years
Scrap value	₹ 1,60,000
Diesel Cost	₹ 78.50 per litre

Each bus gives an average of 5 km. per litre of diesel. The seating capacity of each bus is 40 students.

The school follows differential transportation fees based on distance travelled as under:

Students picked up and dropped within the range of distance from the school	Transportation fee	Percentage of students availing this facility
2 km.	25% of Full	15%
4 km.	50% of Full	30%
8 km.	Full	55%

Due to a pandemic, lockdown was imposed on schools and the school remained closed from April 2020 to December 2020. Drivers and cleaners were paid 75% of their salary during the lockdown period. Repairing cost reduced to 75% for the year 2020.

Ignore the interest cost.

Required:

(i) Prepare a statement showing the expenses of operating a single bus and the fleet of 25 buses for a year.

(ii) Find out transportation fee per student per month in respect of:

(a) Students coming from a distance of upto 2 km. from the school.

(b) Students coming from a distance of upto 4 km. from the school; and

(c) Students coming from a distance of upto 8 km. from the school.

(iii) Calculate the minimum bus fare that has to be recovered from the students for the year 2020.

Standard Costing

8. LM Limited produces a product 'SX4' which is sold in a 10 Kg. packet. The standard cost card per packet of 'SX4' is as follows:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹ 80 per hour	640
Variable Overhead 8 hours @ ₹ 20 per hour	160
Fixed Overhead	250
	1,950

Budgeted output for a quarter of a year was 10,000 Kg. Actual output is 9,000 Kg.

Actual costs for this quarter are as follows:

	(₹)
Direct Materials 8,900 Kg @ ₹ 92 per Kg.	8,18,800

Direct Labour 7,000 hours @ ₹ 84 per hour	5,88,000
Variable Overhead incurred	1,40,000
Fixed Overhead incurred	2,60,000

You are required to calculate:

(i) Material Usage Variance

(ii) Material Price Variance

(iii) Material Cost Variance

(iv) Labour Efficiency Variance

(v) Labour Rate Variance

(vi) Labour Cost Variance

(vii) Variable Overhead Cost Variance

(viii) Fixed Overhead Cost Variance.

Marginal Costing

9. The following figures are related to KG Limited for the year ending 31st March, 2020:

Sales - 48,000 units @ ₹ 400 per unit;

P/V Ratio 25% and Break-even Point 50% of sales.

You are required to calculate:

(i) Fixed cost for the year

(ii) Profit earned for the year

(iii) Units to be sold to earn a target net profit of ₹ 22,00,000 for a year.

(iv) Number of units to be sold to earn a net income of 25% on cost.

(v) Selling price per unit if Break-even Point is to be brought down by 4,000 units.

Budget and Budgetary Control

10. RS Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 302.4 lakh during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹ 60 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 69,12,000.

The other relevant details are as under:

Purchase Price:	Material A	₹ 160 per kg
	Materials B	₹ 100 per kg

Labour Rate:	Machine Shop	₹ 140 per hour
	Assembly Shop	₹ 70 per hour

	Finished Stock	Material A	Material B
Opening Stock	2,500 units	7,500 kg	4,000 kg
Closing Stock	3,000 units	8,000 kg	5,500 kg

Required

(i) Calculate number of units of product proposed to be sold and selling price per unit,

(ii) Prepare Production Budget in units and

(iii) Prepare Material Purchase Budget in units.

Miscellaneous

11. (a) Write note on cost-plus-contracts.

(b) How apportionment of joint costs upto the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? Discuss.

(c) Discuss cost classification based on variability and controllability.

(d) Describe the salient features of budget manual.

SUGGESTED ANSWERS

1. Working Notes:

(i) Computation of Annual consumption & Annual Demand for raw material 'D':

Sales forecast of the product 'X'	20,000 units
Less: Opening stock of 'X'	1,800 units
Fresh units of 'X' to be produced	18,200 units
Raw material required to produce 18,200 units of 'X' (18,200 units × 4 kg.)	72,800 kg.
Less: Opening Stock of 'D'	2,000 kg.
Annual demand for raw material 'D'	70,800 kg.

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

$$EOQ = \sqrt{\frac{2 \times \text{Annual demand of 'D'} \times \text{Ordering cost}}{\text{Carrying cost per unit per annum}}}$$

$$= \sqrt{\frac{2 \times 70,800 \text{ kg.} \times ₹1,340}{₹250 \times 14\%}} = \sqrt{\frac{2 \times 70,800 \text{ kg.} \times ₹1,340}{₹35}} = 2,328 \text{ kg.}$$

(iii) Re- Order level:

= (Maximum consumption per day × Maximum lead time)

$$= \left\{ \left(\frac{\text{Annual Consumption of 'D'}}{300 \text{ days}} + 40 \text{ kg.} \right) \times 8 \text{ days} \right\}$$

$$= \left\{ \left(\frac{70,800 \text{ kg.}}{300 \text{ days}} + 40 \text{ kg.} \right) \times 8 \text{ days} \right\} = 2,208 \text{ kg.}$$

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

Average Consumption per day = 236 Kg.

Hence, Maximum Consumption per day = 236 kg. + 40 kg. = 276 kg.

So Minimum consumption per day will be:

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

Or, 236 kg. $= \frac{\text{Min. consumption} + 276 \text{ kg.}}{2}$

Or, Min. consumption = 472 kg – 276 kg. = 196 kg.

(a) Re-order Quantity:

= EOQ – 400 kg. = 2,328 kg. – 400 kg. = 1,928 kg.

(b) Maximum Stock level:

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

= 2,208 kg. + 1,928 kg. – (196 kg. × 4 days) = 4,136 kg. – 784 kg. = 3,352 kg.

(c) Minimum Stock level:

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

= 2,208 kg. – (236 kg. × 6 days) = 792 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	1,928 kg.	2,328 kg.

II	No. of orders a year	$\frac{70,800\,kg.}{1,928\,kg.} = 36.72$ or 37 orders	$\frac{70,800\,kg.}{2,328\,kg.} = 30.41$ or 31 orders
III	Ordering Cost	37 orders × ₹ 1,340 = ₹ 49,580	31 orders × ₹ 1,340 = ₹ 41,540
IV	Average Inventory	$\frac{1,928\,kg.}{2} = 964\,kg.$	$\frac{2,328\,kg.}{2} = 1,164\,kg.$
V	Carrying Cost	964 kg. × ₹ 35 = ₹ 33,740	1,164 kg. × ₹ 35 = ₹ 40,740
VI	Total Cost	₹ 83,320	₹ 82,280

Extra Cost incurred due to not ordering EOQ = ₹ 83,320 - ₹ 82,280 = ₹ 1,040

2. Workings Notes:

Calculation of Total hours saved:

	M	J
No. of garments assigned (Pieces.)	15	21
Hour allowed per piece (Hours)	8	8
Total hours allowed (Hours)	120	168
Hours Taken (Hours)	100	140
Hours Saved (Hours)	20	28

(i) Calculation of loss incurred due to incorrect rate selection:

(While calculating loss, only excess rate per hour has been taken)

	M (₹)	J (₹)	Total (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	120 (50% of 20 Hrs. × ₹12)	168 (50% of 28 Hrs. × ₹12)	288
Excess Wages Paid	1,320	1,848	3,168

(ii) Calculation of loss incurred due to incorrect rate selection had Rowan scheme of bonus payment followed:

	M (₹)	J (₹)	Total (₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880
Bonus (as per Rowan Scheme) $\left(\frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Excess Rate}\right)$	200 $\left(\frac{100}{120} \times 20 \times ₹12\right)$	280 $\left(\frac{140}{168} \times 28 \times ₹12\right)$	480
Excess Wages Paid	1,400	1,960	3,360

(iii) Calculation of amount that could have been saved if Rowan Scheme were followed:

	M (₹)	J (₹)	Total (₹)
Wages paid under Halsey Scheme	1,320	1,848	3,168
Wages paid under Rowan Scheme	1,400	1,960	3,360
Difference (loss)	(80)	(112)	(192)

(iv) Rowan Scheme of incentive payment has the following benefits, which is suitable with the nature of business in which JBL Sisters operates:

(a) Under Rowan Scheme of bonus payment, workers cannot increase their earnings or bonus by merely increasing its work speed. Bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.

(b) If the rate setting department commits any mistake in setting standards for time to be taken to complete the works, the loss incurred will be relatively low.

3. Working Note:

1. Effective machine hour:

   = Budgeted working hours – Machine Set-up time

   = 2,496 hours – 312 hours = 2,184 hours.

2. Operators' salary per annum:

Salary (3 operators × ₹ 30,000 × 12months)	₹ 10,80,000
Add: Fringe benefits (20% of ₹ 10,80,000)	₹ 2,16,000
	₹ 12,96,000

3. Depreciation per annum

$= \frac{₹24,90,000 - ₹90,000}{12 \text{ years}} = ₹\ 2,00,000$

Computation of Machine hour Rate

	Amount p.a. (₹)	Amount per hour (₹)
Standing charges		
Operators' Salary $\left(\frac{₹12,96,000}{6 \text{ machines}} \times \frac{1}{2,184 \text{ hours}}\right)$	12,96,000	98.90
Departmental and general overheads: (₹ 5,00,000 × 110%) $\left(\frac{₹5,50,000}{6 \text{ machines}} \times \frac{1}{2,184 \text{ hours}}\right)$	5,50,000	41.97
(A)	18,46,000	140.87
Machine Expenses		
Depreciation $\left(\frac{₹2,00,000}{2,184 \text{ hours}}\right)$	2,00,000	91.58
Electricity:		
During working hours (2,496 hours × 60 units × ₹ 6)	8,98,560	411.43
During maintenance hours (416 hours × 10 units × ₹ 6)	24,960	11.43
Component replacement cost (2,400 × 52 weeks)	1,24,800	57.14
Machine maintenance cost	2,40,000	109.89
(B)	14,88,320	681.47
Machine Hour Rate (A + B)		822.34

4. (i) Statement of Profit as per financial records

(for the year ended March 31, 2020)

	(₹)		(₹)
To Opening stock of Finished Goods	1,06,250	By Sales	45,60,000

To Work-in-process	92,000	By Closing stock of finished Goods	91,300
To Raw materials consumed	16,80,000	By Work-in-Process	82,400
To Direct labour	12,20,000	By Rent received	92,000
To Factory overheads	8,44,000	By Interest received	76,000
To Administration overheads	3,96,000		
To Selling & distribution overheads	1,44,000		
To Dividend paid	2,44,000		
To Bad debts	36,000		
To Profit	1,39,450		
	49,01,700		49,01,700

Statement of Profit as per costing records
(for the year ended March 31, 2020)

	(₹)
Sales revenue (A) (12,615 units)	45,60,000
Cost of sales:	
Opening stock (625 units × ₹ 240)	1,50,000
Add: Cost of production of 12,405 units (Refer to working note 2)	43,28,140
Less: Closing stock $\left(\frac{₹43,28,140 \times 415 \text{ units}}{12,405 \text{ units}}\right)$	(1,44,795)
Production cost of goods sold (12,615 units)	43,33,345
Selling & distribution overheads (12,615 units × ₹ 6)	75,690
Cost of sales (B)	44,09,035
Profit {(A) – (B)}	1,50,965

(ii) Statement of Reconciliation

(Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		1,50,965

Add: Administration overheads over absorbed (₹ 5,64,540 – ₹ 3,96,000)	1,68,540	
Opening stock overvalued (₹ 1,50,000 – ₹ 1,06,250)	43,750	
Interest received	76,000	
Rent received	92,000	
Factory overheads over recovered (₹ 8,54,000 – ₹ 8,44,000)	10,000	3,90,290
		5,41,255
Less: Selling & distribution overheads under recovery (₹ 1,44,000 – ₹ 75,690)	68,310	
Closing stock overvalued (₹1,44,795 – ₹ 91,300)	53,495	
Dividend	2,44,000	
Bad debts	36,000	(4,01,805)
Profit as per financial accounts		1,39,450

Working notes:

1. Number of units produced

	Units
Sales	12,615
Add: Closing stock	415
Total	13,030
Less: Opening stock	(625)
Number of units produced	12,405

2. Cost Sheet

	(₹)
Raw materials consumed	16,80,000
Direct labour	12,20,000
Prime cost	29,00,000
Factory overheads (70% of direct wages)	8,54,000
Factory cost	37,54,000
Add: Opening work-in-process	92,000

Less: Closing work-in-process	(82,400)
Factory cost of goods produced	37,63,600
Administration overheads (15% of factory cost)	5,64,540
Cost of production of 12,405 units (Refer to working note 1)	43,28,140
Cost of production per unit: $= \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{₹43,28,140}{12,405 \text{ units}} = ₹348.90$	

5. (i) Calculation of Overhead Recovery Rate:

$$\text{Factory Overhead Recovery Rate} = \frac{\text{Factory Overhead in } 2019-20}{\text{Direct Labour Costs in } 2019-20} \times 100$$

$$= \frac{₹\ 30,80,000}{₹90,50,000} \times 100 = 34\% \text{ of Direct labour}$$

Administrative Overhead Recovery Rate

$$= \frac{\text{Administrative Overhead in 2019-20}}{\text{Factory Costs in 2019-20 (W.N.)}} \times 100$$

$$= \frac{₹\ 20,50,400}{₹\ 2,96,80,000} \times 100 = 6.91\% \text{ of Factory Cost}$$

Working Note: Calculation of Factory Cost in 2019-20

Particulars	Amount (₹)
Opening Stock of Material	15,00,000
Add: Purchase of Material	1,80,50,000
Less: Closing Stock of Material	(20,00,000)
Material Consumed	1,75,50,000
Direct Labour	90,50,000
Prime Cost	2,66,00,000
Factory Overhead	30,80,000
Factory Cost	2,96,80,000

(ii) Job Cost Sheet for the order received in 2020-21

Particulars	Amount (₹)
Material	80,00,000
Labour	40,50,000
Factory Overhead (34% of ₹ 40,50,000)	13,77,000
Factory Cost	1,34,27,000
Administrative Overhead (6.91% of ₹ 1,34,27,000)	9,27,806
Cost of delivery	4,50,000
Total Cost	1,48,04,806
Add: Profit @ 25% of Sales or 33.33% of cost	49,34,935
Sales value (Price to be quoted for the order)	1,97,39,741

Hence the price to be quoted is ₹ 1,97,39,741.

6. Process I

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
40,000	Completed	30,000	100	30,000	100	30,000	100	30,000
	Closing WIP	10,000	100	10,000	50	5,000	50	5,000
40,000		40,000		40,000		35,000		35,000

Particulars	Materials	Labour	Overhead	Total
Cost incurred (₹)	3,00,000	3,50,000	2,45,000	8,95,000
Equivalent units	40,000	35,000	35,000	--
Cost per equivalent unit (₹)	7.50	10.00	7.00	24.50

Process-I Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Materials	40,000	3,00,000	By Process-II A/c (30,000 units × ₹24.5)	30,000	7,35,000

To Labour		3,50,000	By Closing WIP*	10,000	1,60,000
To Overhead		2,45,000			
	40,000	8,95,000		40,000	8,95,000

***** Material (10,000 units × ₹ 7.5) + Labour (5,000 units × ₹ 10) + Overheads (5,000 units × ₹ 7)

= ₹ 75,000 + ₹ 50,000 + ₹ 35,000 = ₹ 1,60,000

Process II

Statement of Equivalent Production and Cost

Input (Units)	Particulars	Output Units	Equivalent Production					
			Materials		Labour		Overheads	
			(%)	Units	(%)	Units	(%)	Units
30,000	Completed	28,000	100	28,000	100	28,000	100	28,000
	Normal loss	200		--		--		--
	Closing WIP	1,800	100	1,800	25	450	25	450
30,000		30,000		29,800		28,450		28,450

Particulars	Materials	Labour	Overhead	Total
Process-I Cost	7,35,000	--	--	7,35,000
Cost incurred (₹)	--	71,125	85,350	1,56,475
Equivalent units	29,800	28,450	28,450	--
Cost per equivalent unit (₹)	24.6644	2.5000	3.0000	30.1644

Process-II Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	30,000	7,35,000	By Normal loss A/c	200	--
To Packing Material	--	80,000	By Finished Goods Stock A/c	28,000*	9,24,604
To Direct Wages	--	71,125	By Closing WIP	1,800**	46,871
To Factory Overhead	--	85,350			
	30,000	9,71,475		30,000	9,71,475

* 28,000 × ₹ 30.1644 = ₹ 8,44,603 + ₹ 80,000 (Packing Material Cost) = ₹ 9,24,604

** (1,800 units × ₹ 24.6644) + 450 units × (₹ 2.5 + ₹ 3) = ₹ 46,871

7. (i) Statement showing the expenses of operating a single bus and the fleet of 25 buses for a year

Particulars	Per bus per annum (₹)	Fleet of 25 buses per annum (₹)
Running costs: (A)		
Diesel (Refer to working note 1)	2,21,056	55,26,400
Repairs & maintenance costs: (B)	20,500	5,12,500
Fixed charges:		
Driver's salary (₹ 12,000 × 12 months)	1,44,000	36,00,000
Cleaners salary (₹8,000 × 12 months)	96,000	24,00,000
Licence fee, taxes etc.	8,400	2,10,000
Insurance	15,600	3,90,000
Depreciation $\left(\frac{₹\ 20,00,000 - ₹1,60,000}{16 \text{ years}}\right)$	1,15,000	28,75,000
Total fixed charges: (C)	3,79,000	94,75,000
Total expenses: (A+B+C)	6,20,556	1,55,13,900

(ii) Average cost per student per month in respect of students coming from a distance of:

(a)	2 km. from the school {₹ 6,20,556 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 219.12
(b)	4 km. from the school (₹ 219.12 × 2)	₹ 438.24
(c)	8 km. from the school (₹ 219.12 × 4)	₹ 876.48

(iii) Calculation of minimum bus fare to be recovered from the students during the year 2020:

Statement showing the expenses of operating a single bus in year 2020

Particulars	Per bus per annum (₹)
Running costs : (A)	
Diesel (Refer to working note 3)	66,316.80
Repairs & maintenance costs: (B)	15,375

(₹20,500 x 0.75)	
Fixed charges:	
Driver's salary {₹12,000 × 3 months + (75% of ₹12,000 × 9 months)}	1,17,000
Cleaners salary {₹8,000 × 3 months + (75% of ₹8,000 × 9 months)}	78,000
Licence fee, taxes etc.	8,400
Insurance	15,600
Depreciation $\left(\frac{₹\ 20,00,000 - ₹1,60,000}{16 \text{ years}}\right)$	1,15,000
Total fixed charges: (C)	3,34,000
Total expenses: (A+B+C)	4,15,691.80

Minimum bus fare to be recovered:

(a)	2 km. from the school {₹ 4,15,691.8 / (236 students × 12 months)} (Refer to Working Note 2)	₹ 146.78
(b)	4 km. from the school (₹ 146.78 × 2)	₹ 293.56
(c)	8 km. from the school (₹146.78 × 4)	₹ 587.12

Working Notes:

1. Calculation of diesel cost per bus:

No. of trips made by a bus each day	4
Distance travelled in one trip both ways (8 km. × 2 trips)	16 km.
Distance travelled per day by a bus (16 km. × 4 shifts)	64 km.
Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled per year (1,408. × 10 months)	14,080 km.
No. of litres of diesel required per bus per year (14,080 km. ÷ 5 km.)	2,816 litres
Cost of diesel per bus per year (2,816 litres × ₹ 78.50)	₹ 2,21,056

2. Calculation of equivalent number of students per bus:

Bus capacity of 2 trips (40 students × 2 trips)	80 students
$^1/_4{}^{th}$ fare students (15% × 80 students)	12 students
½ fare students (30% × 80 students × 2) (equivalent to $^1/_4{}^{th}$ fare students)	48 students

Full fare students (55% × 80 students × 4) (equivalent to $^1/_4{}^{th}$ fare students)	176 students
Total students equivalent to $^1/_4{}^{th}$ fare students	236 students

3. Calculation of diesel cost per bus in Year 2020:

Distance travelled during a month (64 km. × 22 days)	1,408 km.
Distance travelled during the year 2020 (1,408 × 3 months)	4,224 km.
No. of litres of diesel required per bus per year (4,224 km. ÷ 5 km.)	844.8 litres
Cost of diesel per bus per year (844.8 litres × ₹ 78.50)	₹ 66,316.80

8. (i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)
= ₹ 90 (9,000 kg. – 8,900 kg.)
= ₹ 9,000 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)
= 8,900 kg. (₹ 90 – ₹ 92) = ₹ 17,800 (Adverse)

(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost
= (SQ × SP) – (AQ × AP)
= (9,000 kg. × ₹ 90) – (8,900 kg. × ₹ 92)
= ₹ 8,10,000 – ₹ 8,18,800
= ₹ 8,800 (Adverse)

(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)
= ₹ 80 ($\frac{9,000}{10} \times 8 \text{hours}$ – 7,000 hrs.)
= ₹ 80 (7,200 hrs. – 7,000 hrs.)
= ₹ 16,000 (Favourable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)
= 7,000 hrs. (₹ 80 – ₹ 84)
= ₹ 28,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost
= (SH × SR) – (AH × AR)
= (7,200 hrs. × ₹ 80) – (7,000 hrs. × ₹ 84)
= ₹ 5,76,000 – ₹ 5,88,000
= ₹ 12,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost
= (7,200 hrs. × ₹ 20) – ₹ 1,40,000
= ₹ 4,000 (Adverse)

(viii) Fixed Overhead Cost Variance= Absorbed Fixed Overhead–Actual Fixed Overhead

$$= \frac{₹\ 250}{10\ kgs.} \times 9{,}000 kgs. - ₹\ 2{,}60{,}000$$

= ₹ 2,25,000 – ₹ 2,60,000 = ₹ 35,000 (Adverse)

9. Break- even point (in units) is 50% of sales i.e. 24,000 units.

Hence, Break- even point (in sales value) is 24,000 units × ₹ 400 = ₹ 96,00,000

(i) Break even sales $= \frac{\text{Fixed Cost}}{\text{P / V ratio}}$

Or, ₹ 96,00,000 $= \frac{\text{Fixed Cost}}{25\%}$

Or, Fixed Cost = ₹ 96,00,000 × 25%
= ₹ 24,00,000

So Fixed Cost for the year is ₹ 24,00,000

(ii) Contribution for the year = (48,000 units × ₹ 400) × 25%
= ₹ 48,00,000

Profit for the year = Contribution – Fixed Cost
= ₹ 48,00,000 - ₹ 24,00,000
= ₹ 24,00,000

(iii) Target net profit is ₹22,00,000

Hence, Target contribution = Target Profit + Fixed Cost
= ₹ 22,00,000 + ₹ 24,00,000
= ₹ 46,00,000

Contribution per unit = 25% of ₹ 400 = ₹ 100 per unit

No. of units $= \frac{₹46{,}00{,}000}{₹100\ \text{per unit}}$ = 46,000 units

So, 46,000 units to be sold to earn a target net profit of ₹ 22,00,000 for a year.

(iv) Let desired total Sales (Number of units × Selling price) be x then desired profit is 25% on Cost or 20% on Sales i.e. 0.2 x

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

$$x = \frac{₹24,00,000 + 0.2x}{25\%}$$

or, $0.25x$ = ₹ 24,00,000 + $0.2x$

or, $0.05x$ = ₹ 24,00,000

or, x = ₹ 4,80,00,000

$$\text{No. of units to be sold} = \frac{₹4,80,00,000}{₹400} = 1,20,000 \text{ units}$$

(v) If Break- even point is to be brought down by 4,000 units then Break-even point will be

24,000 units – 4,000 units = 20,000 units

Let Selling price be ₹ x and fixed cost and variable cost per unit remain unchanged i.e. ₹ 24,00,000 and ₹ 300 respectively.

Break- even point:

Sales revenue = Total cost

$20,000x$ = (20,000 × ₹ 300) + ₹ 24,00,000

Or, $20,000x$ = ₹ 60,00,000 + ₹ 24,00,000

$$\text{Or, } x = \frac{₹\,84,00,000}{20,000} = ₹\,420$$

∴ Selling Price should be ₹ 420

Hence, selling price per unit shall be ₹ 420 if Break-even point is to be brought down by 4,000 units.

10. Workings:

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs. @ ₹ 140 per hour	560
Assembly Shop: 2 hrs. @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold = Total Variable Cost / Variable Cost per unit
= ₹ 1,72,80,000 / ₹ 2,160
= 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold
= ₹ 3,02,40,000 / 8,000 units
= ₹ 3,780

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000
Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	51,000 (8,500 units × 6 Kg.)	25,500 (8,500 units × 3 Kg.)
Add: Desired Closing Stock	8,000	5,500

Total Requirements	59,000	31,000
Less: Opening Stock	(7,500)	(4,000)
Quantity to be purchased	51,500	27,000

11. (a) These contracts provide for the payment by the contractee of the actual cost of construction plus a stipulated profit, mutually decided between the two parties.

The main features of these contracts are as follows:

(i) The practice of cost-plus contracts is adopted in the case of those contracts where the probable cost of the contracts cannot be ascertained in advance with a reasonable accuracy.

(ii) These contracts are preferred when the cost of material and labour is not steady and the contract completion may take number of years.

(iii) The different costs to be included in the execution of the contract are mutually agreed, so that no dispute may arise in future in this respect. Under such type of contracts, contractee is allowed to check or scrutinize the concerned books, documents and accounts.

(iv) Such a contract offers a fair price to the contractee and also a reasonable profit to the contractor.

The contract price here is ascertained by adding a fixed and mutually pre-decided component of profit to the total cost of the work.

(b) Apportionment of Joint Cost amongst Joint Products using:

Market value at the point of separation: This method is used for apportionment of joint costs to joint products upto the split off point. It is difficult to apply if the market value of the product at the point of separation is not available. It is useful method where further processing costs are incurred disproportionately.

Net realizable value Method: From the sales value of joint products (at finished stage) the followings are deducted:

– Estimated profit margins

– Selling & distribution expenses, if any

– Post split off costs.

The resultant figure so obtained is known as net realizable value of joint products. Joint costs are apportioned in the ratio of net realizable value.

(c) Cost classification based on variability

(i) 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.

(ii) **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.

(iii) **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

(i) **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.

(ii) **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.

(d) Salient features of Budget Manual

- Budget manual contains much information which is required for effective budgetary planning.
- A budget manual is a collection of documents that contains key information for those involved in the planning process.
- An introductory explanation of the budgetary planning and control process, including a statement of the budgetary objective and desired results is included in Budget Manual.
- Budget Manual contains a form of organisation chart to show who is responsible for the preparation of each functional budget and the way in which the budgets are interrelated.
- In contains a timetable for the preparation of each budget.
- Copies of all forms to be completed by those responsible for preparing budgets, with explanations concerning their completion is included in Budget Manual.

PART-II: FINANCIAL MANAGEMENT

QUESTIONS

Time Value of Money

1. Ajay invested ₹ 50,000 in a 6-month Term Deposit on 1st April, 2020 earning 7% interest compounded quarterly. On October 1st, 2020, the said Term Deposit matured, so, he added enough additional money to invest in another 6-month Term Deposit for ₹ 60,000 earning 9% compounded monthly.

   (a) How much additional amount did the person invest on October 1st?

   (b) What was the maturity value of his Time Deposit on April 1, 2021?

   (c) How much total interest was earned?

Ratio Analysis

2. Given below are the estimations for the next year by Niti Ltd.:

Particulars	(₹ in crores)
Fixed Assets	5.20
Current Liabilities	4.68
Current Assets	7.80
Sales	23.00
EBIT	2.30

The company will issue equity funds of ₹ 5 crores in the next year. It is also considering the debt alternatives of ₹ 3.32 crores for financing the assets. The company wants to adopt one of the policies given below:

(₹ in crores)

Financing Policy	Short term debt @ 12%	Long term debt @ 16%	Total
Conservative	1.08	2.24	3.32
Moderate	2.00	1.32	3.32
Aggressive	3.00	0.32	3.32

Assume tax rate of 30%. Calculate the following for each of the financing policy:

(i) Return on total assets

(ii) Return on owner's equity

(iii) Net Working capital

(iv) Current Ratio

Also advise which Financing policy should be adopted if the company wants high returns.

Cost of Capital

3. ABC Company's equity share is quoted in the market at ₹ 25 per share currently. The company pays a dividend of ₹ 2 per share and the investor's market expects a growth rate of 6% per year.

   You are required to:

   (i) Calculate the company's cost of equity capital.

   (ii) If the anticipated growth rate is 8% per annum, calculate the indicated market price per share.

   (iii) If the company issues 10% debentures of face value of ₹ 100 each and realizes ₹ 96 per debenture while the debentures are redeemable after 12 years at a premium of 12%, what will be the cost of debenture?

   Assume Tax rate to be 50%.

Capital Structure

4. Zordon Ltd. has net operating income of ₹ 5,00,000 and total capitalization of ₹ 50,00,000 during the current year. The company is contemplating to introduce debt financing in capital structure and has various options for the same. The following information is available at different levels of debt value:

Debt value (₹)	Interest rate (%)	Equity capitalization rate (%)
0	-	10.00
5,00,000	6.0	10.50
10,00,000	6.0	11.00
15,00,000	6.2	11.30
20,00,000	7.0	12.40
25,00,000	7.5	13.50
30,00,000	8.0	16.00

   Assuming no tax and that the firm always maintains books at book values, you are required to calculate:

   (i) Amount of debt to be employed by firm as per traditional approach.

   (ii) Equity capitalization rate, if MM approach is followed.

Leverage

5. Net sales of AP Ltd. for the FY. 2020-21 is ₹ 60.00 lakhs along with fixed cost (excluding interest) of ₹ 4.08 lakhs. The capital employed of the company comprises ₹ 34.00 lakhs of Equity Share Capital of ₹ 10 each, and ₹ 42.50 lakhs of 12% Debentures of ₹ 100 each. Considering the following additional information:

Operating leverage	1.4
Combined leverage	2.8
Income tax rate	30%

You are required to:

(i) Calculate Financial leverage.

(ii) Calculate Variable Cost.

(iii) Calculate P/V ratio and Earning per Share (EPS).

If the company belongs to an industry, whose assets turnover is 1.5, does it have a high or low assets turnover?

Capital Budgeting

6. The General Manager of Merry Ltd. is considering the replacement of five-year-old equipment. The company has to incur excessive maintenance cost of the equipment. The equipment has zero written down value. It can be modernized at a cost of ₹ 1,40,000 enhancing its economic life to 5 years. The equipment could be sold for ₹ 30,000 after 5 years. The modernization would help in material handling and in reducing labour & maintenance, repairs costs.

The company has another alternative to buy a new machine at a cost of ₹ 3,50,000 with an economic life of 5 years and salvage value of ₹ 60,000. The new machine is expected to be more efficient in reducing costs of material handling, labour & maintenance and repairs, etc.

The annual cost are as follows:

	Existing Equipment (₹)	Modernization (₹)	New Machine (₹)
Wages & Salaries	45,000	35,500	15,000
Supervision	20,000	10,000	7,000
Maintenance	25,000	5,000	2,500
Power	30,000	20,000	15,000
	1,20,000	70,500	39,500

Assuming tax rate of 50% and required rate of return of 10%, should the company modernize the equipment or buy a new machine?

PV factor at 10% are as follows:

Year	1	2	3	4	5
PV factor	0.909	0.826	0.751	0.683	0.621

Management of Receivables (Debtors)

7. Zeta Limited has a current credit sales of ₹ 7,20,000. It is considering revising its credit policy. The proposed terms of credit will be "2/10, net 30" against the present policy of "net 30".

   As a result, Zeta Limited's credit sales are expected to increase by ₹ 20,000 and the average collection period will reduce from 30 days to 20 days. It is also expected that 50 percent of the customers will take the discounts and pay on the 10th day and rest of the customers will pay on the 30th day. Bad debt losses will remain at 2 percent of sales. The variable cost ratio is 70 percent.

   Its corporate tax rate is 50 percent and opportunity cost of investment in receivables is 10 percent.

   Advise whether Zeta Limited should change its credit period?

Management of working Capital

8. TN Ltd. is a readymade garment manufacturing company. Its production cycle indicates that materials are introduced in the beginning of the production phase; wages and overhead accrue evenly throughout the period of cycle.

   The following figures for the 12 months ending 31st March, 2021 are given:

Production of shirts	54,000 units
Selling price per unit	₹ 200
Duration of the production cycle	1 month
Raw material inventory held	2 month's consumption
Finished goods stock held for	1 month
Ratio of cost to sales price	
Raw materials	60%
Direct wages	10%
Overheads	20%

   Credit allowed to debtors is 1.5 months and credit allowed by creditors is 1 month.

   Wages are paid in the next month following the month of accrual.

   In the work-in-progress, 50% of wages and overheads are supposed to be conversion costs.

   Cash is to be held to the extent of 40% of current liabilities and safety margin of 15% will be maintained.

   Calculate amount of working capital required for the company on cash cost basis.

Cash Flow Statement

9. The Balance Sheet (extract) of X Ltd. as on 31st March, 2021 is as follows:

		Particulars	Note No.	2021 (₹)
I		Equity and Liabilities:		
	(1)	Shareholders' funds		
		(a) Equity Share Capital		60,00,000
		(b) 8% Preference Share Capital		32,50,000
		(c) Reserves and surplus		14,00,000
	(2)	Non-current liabilities		
		(a) Long- term borrowings		
		(i) 10% Debentures		20,00,000
	(3)	Current liabilities		
		(a) Trade Payables		32,50,000
				1,59,00,000
II		Assets:		
	(1)	Non-current assets		
		(a) Fixed assets (tangible)		1,62,50,000
		Less: Accumulated Depreciation		(52,00,000)
				1,10,50,000
	(2)	Current Assets		
		(a) Inventories		20,00,000
		(b) Trade receivable		26,00,000
		(c) Cash and cash equivalents		2,50,000
				1,59,00,000

The following additional information is available:

(i) The stock turnover ratio based on cost of goods sold would be 6 times.

(ii) The cost of fixed assets to sales ratio would be 1.4.

(iii) Fixed assets costing ₹ 30,00,000 to be installed on 1st April, 2021, payment would be made on March 31, 2022.

(iv) In March, 2022, a dividend of 7 per cent on equity capital would be paid.

(v) ₹ 5,50,000, 11% Debentures would be issued on 1st April, 2021.

(vi) ₹ 35,00,000, Equity shares would be issued on 31st March, 2022.

(vii) Trade payables would be 20% of materials consumed.

(viii) Trade receivables would be 15% of sales.

(ix) The cost of goods sold would be 90 per cent of sales including material 40 per cent and depreciation 5 per cent of sales.

(x) The profit is subject to debenture interest and taxation @ 30 per cent.

Required:

(i) Prepare the projected Balance Sheet as on 31st March, 2022.

(ii) Prepare projected Cash Flow Statement using indirect method.

Miscellaneous

10. (i) "Profit Maximization cannot be the sole objective of a company". Comment.

(ii) Discuss advantages and disadvantages of raising funds by issue of preference shares.

SUGGESTED ANSWERS

1. (a) The initial investment earned interests for April – June and July – September quarter, i.e. for 2 quarters.

In this case, $i = \frac{7}{4}\%$, $n = 2$, P = 50,000

Compounded Amount = $P(1+i)^n$ = 50,000 $\left(1+ \frac{7}{4}\%\right)^2$ = ₹ 51,765.31

The additional amount = ₹ (60,000 – 51,765.31) = ₹ 8,234.69

(b) In this case, the Term Deposit earned interest compounded monthly for 2 quarters.

Here, $i = \frac{9}{12}\%$, n = 6, P = 60,000

Required maturity value = $P(1+i)^n$ = 60,000 $\left(1+ \frac{9}{12}\%\right)^6$ = ₹ 62,751.13

(c) Total interest earned = ₹ (1,765.31+ 2,751.13) = ₹ 4,516.44

2. (i) Return on total assets

$$\text{Return on total assets} = \frac{\text{EBIT}(1 - T)}{\text{Total assets (FA + CA)}}$$

$$= \frac{₹\ 2.30 \text{ crores}(1 - 0.3)}{₹\ 5.20 \text{ crores} + ₹\ 7.80 \text{ crores}}$$

$$= \frac{₹\ 1.61 \text{crores}}{₹\ 13 \text{ crores}} = 0.1238 \text{ or } 12.38\%$$

(ii) Return on owner's equity

(Amount in ₹)

	Financing policy		
	Conservative	**Moderate**	**Aggressive**
Expected EBIT	2,30,00,000	2,30,00,000	2,30,00,000
Less: Interest			
Short term Debt @ 12%	12,96,000	24,00,000	36,00,000
Long term Debt @ 16%	35,84,000	21,12,000	5,12,000
Earnings before tax (EBT)	1,81,20,000	1,84,88,000	1,88,88,000
Less: Tax @ 30%	54,36,000	55,46,400	56,66,400
Earnings after Tax (EAT)	1,26,84,000	1,29,41,600	1,32,21,600
Owner's Equity	5,00,00,000	5,00,00,000	5,00,00,000
Return on owner's equity $= \frac{\text{Net Profit after taxes (EAT)}}{\text{Owners' equity}}$	$= \frac{1,26,84,000}{5,00,00,000}$ = 0.2537 or 25.37%	$= \frac{1,29,41,600}{5,00,00,000}$ = 0.2588 or 25.88%	$= \frac{1,32,21,600}{5,00,00,000}$ = 0.2644 or 26.44%

(iii) Net Working capital

(₹ in crores)

	Financing policy		
	Conservative	**Moderate**	**Aggressive**
Current Liabilities (Excluding Short term Debt)	4.68	4.68	4.68
Short term Debt	1.08	2.00	3.00
Total Current Liabilities	5.76	6.68	7.68
Current Assets	7.80	7.80	7.80
Net Working capital	7.80 - 5.76	7.80 - 6.68	7.80 - 7.68

= Current Assets - Current Liabilities	= 2.04	= 1.12	= 0.12

(iv) Current ratio

(₹ in crores)

	Financing policy		
	Conservative	**Moderate**	**Aggressive**
Current Ratio $= \frac{\text{Current Assets}}{\text{Current Liabilities}}$	$= \frac{7.80}{5.76} = 1.35$	$= \frac{7.80}{6.68} = 1.17$	$= \frac{7.80}{7.68} = 1.02$

Advise: It is advisable to adopt aggressive financial policy, if the company wants high return as the return on owner's equity is maximum in this policy i.e. 26.44%.

3. (i) Cost of Equity Capital (K_e)

$$K_e = \frac{D_1}{P_0} + g = \frac{₹\ 2\ (1 + 0.06)}{₹\ 25} + 0.06 = 0.1448 \text{ or } 14.48\%$$

(ii) Indicated Market Price per share when growth rate is 8% p.a.

$$K_e = \frac{D_1}{P_0} + g$$

$$\text{Or, } P_o = \frac{D_1}{K_e - g} = \frac{₹\ 2\ (1+0.08)}{0.1448 - 0.08} = \frac{₹\ 2.16}{0.0648} = ₹\ 33.33$$

(iii) Cost of Debenture (K_d)

Identification of relevant cash flows

Year	Cash flows
0	Current Market Price (P_0) = ₹ 96
1 to 12	Interest Net of Tax [I (1 – t)] = 10% of ₹ 100 (1 - 0.05) = ₹ 5
12	Redemption Value (RV) = ₹ 100 (1.12) = ₹ 112

Using Approximation method

$$K_d = \frac{I(1-t) + \frac{(RV - NP)}{n}}{\frac{(RV + NP)}{2}} = \frac{10(1-0.5) + \frac{(112-96)}{12}}{\frac{(112+96)}{2}} = \frac{5+1.33}{104} = 0.0609\% \text{ or } 6.09\%$$

***Alternatively*, Using Present Value Method or YTM**

Year	Cash flows (₹)	Discount factor @ 5% (L)	Present Value	Discount factor @ 10% (H)	Present Value (₹)
0	96	1.000	(96.00)	1.000	(96.00)
1 to 12	5	8.863	44.32	6.814	34.07
12	112	0.557	62.38	0.319	35.73
NPV			+10.7		-26.2

$$IRR = L + \frac{NPV_L}{NPV_L - NPV_H}(H-L) = 5\% + \frac{10.7}{10.7-(-26.2)}(10\%-5\%) = 5\% + \frac{53.5}{36.9} = 6.45\%$$

4. (a) Amount of debt to be employed by firm as per traditional approach

Calculation of Equity, W_d and W_e

Total Capital (₹)	Debt (₹)	W_d	Equity (₹)	W_e
(a)	(b)	(b)/(a)	(c) = (a) - (b)	(c)/(a)
50,00,000	0	-	50,00,000	1.0
50,00,000	5,00,000	0.1	45,00,000	0.9
50,00,000	10,00,000	0.2	40,00,000	0.8
50,00,000	15,00,000	0.3	35,00,000	0.7
50,00,000	20,00,000	0.4	30,00,000	0.6
50,00,000	25,00,000	0.5	25,00,000	0.5
50,00,000	30,00,000	0.6	20,00,000	0.4

Statement of Weighted Average Cost of Capital (WACC)

K_e	W_e	K_d	W_d	$K_e W_e$	$K_d W_d$	K_o
(1)	(2)	(3)	(4)	(5) = (1) x (2)	(6) = (3) x (4)	(7) = (5) + (6)
0.100	1.0	-	-	0.100	-	0.100
0.105	0.9	0.060	0.1	0.095	0.006	0.101
0.110	0.8	0.060	0.2	0.088	0.012	0.100
0.113	0.7	0.062	0.3	0.079	0.019	0.098
0.124	0.6	0.070	0.4	0.074	0.028	0.102
0.135	0.5	0.075	0.5	0.068	0.038	0.106
0.160	0.4	0.080	0.6	0.064	0.048	0.112

So, amount of Debt to be employed = ₹ 15,00,000 as WACC is minimum at this level of debt i.e. 9.8%.

(b) As per MM approach, cost of the capital (K_o) remains constant and cost of equity increases linearly with debt.

$$\text{Value of a firm} = \frac{\text{Net Operating Income (NOI)}}{K_0}$$

$$₹\ 50,00,000 = \frac{₹\ 5,00,000}{K_o}$$

$$K_o = \frac{₹\ 5,00,000}{₹\ 50,00,000} = 10\%$$

Statement of Equity Capitalization rate (k_e) under MM approach

Debt (₹)	Equity (₹)	Debt/Equity	K_o	K_d	$K_o - K_d$	$K_e = K_o + (K_o - K_d)\frac{\text{Debt}}{\text{Equity}}$
(1)	(2)	(3) = (1)/(2)	(4)	(5)	(6) = (4) - (5)	(7) = (4) + (6) x (3)
0	50,00,000	0	0.10	-	0.100	0.100
5,00,000	45,00,000	0.11	0.10	0.060	0.040	0.104
10,00,000	40,00,000	0.25	0.10	0.060	0.040	0.110
15,00,000	35,00,000	0.43	0.10	0.062	0.038	0.116
20,00,000	30,00,000	0.67	0.10	0.070	0.030	0.120
25,00,000	25,00,000	1.00	0.10	0.075	0.025	0.125
30,00,000	20,00,000	1.50	0.10	0.080	0.020	0.130

5. (i) Financial leverage

Combined Leverage = Operating Leverage (OL) × Financial Leverage (FL)

2.8 = 1.4 × FL

Or, Financial Leverage = 2

(ii) Variable Cost

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$1.4 = \frac{\text{Sales - Variable Cost}}{\text{Sales - Variable Cost - Fixed Cost}}$$

$$1.4 = \frac{₹\ 60,00,000 - \text{Variable Cost}}{₹\ 60,00,000 - \text{Variable Cost} - ₹\ 4,08,000}$$

₹ 78,28,800 – 1.4 Variable Cost = ₹ 60,00,000 – Variable Cost

Variable Cost = ₹ 45,72,000

(iii) P/V Ratio and EPS

Contribution = Sales – Variable Cost

= ₹ 60,00,000 - ₹ 45,72,000 = ₹ 14,28,000

Now, P/V ratio $= \frac{\text{Contribution (C)}}{\text{Sales (S)}} \times 100 = \frac{₹\ 14,28,000}{₹\ 60,00,000} \times 100 = 23.8\%$

Therefore, P/V Ratio = 23.8%

$$\text{EPS} = \frac{\text{Profit after tax}}{\text{No. of equity shares}}$$

EBT = Contribution – FC – Interest

= ₹ 14,28,000 – ₹ 4,08,000 – ₹ 5,10,000

= ₹ 5,10,000

PAT = EBT – Tax

= ₹ 5,10,000 – ₹ 1,53,000 = ₹ 3,57,000

$$\text{EPS} = \frac{₹\ 3,57,000}{₹\ 3,40,000} = 1.05$$

(iii) Assets turnover

$$\text{Assets turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{₹\ 60,00,000}{₹\ 76,50,000} = 0.784$$

0.784 < 1.5 means lower than industry turnover.

6. Workings:

Calculation of Depreciation:

$$\text{On Modernized Equipment} = \frac{₹\ 1,40,000 - ₹\ 30,000}{5 \text{ years}} = ₹\ 22,000 \text{ p.a.}$$

On New machine $= \frac{₹\ 3,50,000 - ₹\ 60,000}{5 \text{ years}} = ₹\ 58,000$ p.a.

(i) Calculation of Incremental annual cash inflows/ savings:

Particulars	Existing Equipment (₹)	Modernization		New Machine	
		Amount (₹)	Savings (₹)	Amount (₹)	Savings (₹)
	(1)	(2)	(3)=(1)-(2)	(4)	(5)=(1)-(4)
Wages & Salaries	45,000	35,500	9,500	15,000	30,000
Supervision	20,000	10,000	10,000	7,000	13,000
Maintenance	25,000	5,000	20,000	2,500	22,500
Power	30,000	20,000	10,000	15,000	15,000
Total	**1,20,000**	**70,500**	**49,500**	**39,500**	**80,500**
Less: Depreciation (Refer Workings)			22,000		58,000
Total Savings			**27,500**		**22,500**
Less: Tax @ 50%			13,750		11,250
After Tax Savings			**13,750**		**11,250**
Add: Depreciation			22,000		58,000
Incremental Annual Cash Inflows			**35,750**		**69,250**

(ii) Calculation of Net Present Value (NPV)

Particulars	Year	Modernization (₹)	New Machine (₹)
Initial Cash outflow (A)	0	1,40,000.00	3,50,000.00
Incremental Cash Inflows	1-5	1,35,492.50 (₹ 35,750 x 3.790)	2,62,457.50 (₹ 69,250 x 3.790)
Salvage value	5	18,630.00 (₹ 30,000 x 0.621)	37,260.00 (₹ 60,000 x 0.621)
PV of Cash inflows (B)		1,54,122.50	2,99,717.50
Net Present Value (B - A)		14,122.50	(50,282.50)

Advise: The company should modernize its existing equipment and not buy a new machine because NPV is positive in modernization of equipment.

7. Advise to Zeta Limited regarding Change in Credit Policy:

Particulars	(₹)
Current Credit Sales	7,20,000
Increase in Credit Sales	20,000
New Level of Credit Sales	7,40,000
Current Average Collection Period (Days)	30
New Average Collection Period (Days)	20
Current Level of Receivables $\left(₹\ 7,20,000 \times \frac{30}{360}\right)$	60,000
New Level of Receivables $\left(₹\ 7,40,000 \times \frac{20}{360}\right)$	41,111
Cash Discount	2%
Discount Period (Days)	10
Percentage of Customers Taking Discount	50%
Bad Debt Losses	2%
Variable Cost	70%
Corporate Tax Rate	50%
Opportunity Cost of Capital	10%
(A) Increased Credit Sales	20,000
(B) Contribution from Increased Credit Sales [A x (1-0.70)]	6,000
(C) Bad Debt Loss [A x 2%]	400
(D) Cost of Cash Discount [₹ 740,000 x 0.02 x 0.5]	7,400
(E) After-tax Profit [(B - C - D) x (1-0.5)]	(900)
(F) Decrease in Receivable Investment [₹ 41,111 - ₹ 60,000]	(18,889)
(G) Expected Return (E/F)	4.8%
(H) Net Gain % [10% -G]	5.2%

Therefore, Zeta Limited should change the credit policy because it results in net gain of 5.2%.

8. Working Notes:

1. Raw material inventory: The cost of materials for the whole year is 60% of the Sales value.

$$= \frac{54,000 \text{ units} \times (60\% \text{ of } ₹ 200)}{12 \text{ months}} \times 2 \text{ months} = ₹ 10,80,000$$

2. Work-in-process (Each unit of production is expected to be in process for one month):

		(₹)
(a)	Raw materials in work-in-process (being one month's raw material requirements)	5,40,000
(b)	Labour costs in work-in-process $\left(\frac{54,000 \text{ units} \times (10\% \text{ of } ₹200)}{12 \text{ months}} \times 1 \text{month}\right) \times 0.5$	45,000
(c)	Overheads $\left(\frac{54,000 \text{ units} \times (20\% \text{ of } ₹200)}{12 \text{ months}} \times 1 \text{month}\right) \times 0.5$	90,000
		6,75,000

3. Finished goods inventory = $\frac{54,000 \text{ units} \times (90\% \text{ of } ₹ 200)}{12 \text{ months}} \times 1 \text{ month}$ = ₹8,10,000

4. Receivables = $\frac{54,000 \text{ units} \times (90\% \text{ of } ₹200)}{12 \text{ months}} \times 1.5 \text{months}$ = ₹12,15,000

5. Payable to suppliers = $\frac{54,000 \text{ units} \times (60\% \text{ of } ₹ 200)}{12 \text{ months}} \times 1 \text{ month}$ = ₹5,40,000

6. Direct Wages payable = $\frac{54,000 \text{ units} \times (10\% \text{ of } ₹ 200)}{12 \text{ months}} \times 1 \text{ month}$ = ₹ 90,000

Calculation of Working Capital Requirement on cash cost basis

Particulars	(₹)	(₹)
A. Current Assets		
(i) Inventories:		
- Raw Materials	10,80,000	
- Work-in-process	6,75,000	
- Finished goods	8,10,000	25,65,000

(ii) Receivables		12,15,000
(iii) Cash in hand (40% of ₹ 6,30,000)		2,52,000
Total Current Assets		40,32,000
B. Current Liabilities:		
(i) Payables for raw materials		5,40,000
(ii) Direct wages payables		90,000
Total Current Liabilities		6,30,000
Net Working Capital (A – B)		**34,02,000**
Add: Safety margin (15% of Net Working Capital)		5,10,300
Working capital requirement		**39,12,300**

9. Workings:

(1) $\text{Sales} = \frac{\text{Cost of fixed assets}^*}{1.4} = \frac{₹\,1,92,50,000}{1.4} = ₹\ 1,37,50,000$

*Cost of fixed assets:

As on 31st March 2021	₹ 1,62,50,000
Add: Purchased during the year	₹ 30,00,000
	₹ 1,92,50,000

(2) Cost of Goods Sold = (Sales × 0.90) = (₹ 1,37,50,000 × 0.90) = ₹ 1,23,75,000

(3) Material = (Sales × 0.40) = (₹ 1,37,50,000 × 0.40) = ₹ 55,00,000

(4) Depreciation = (Sales × 0.05) = (₹ 1,37,50,000 × 0.05) = ₹ 6,87,500

(5) Operating profit = (Sales × 0.10) = (₹ 1,37,50,000 × 0.10) = ₹ 13,75,000

(6) Calculation of Net Fixed Assets:

	(₹)	(₹)
Opening balance		1,62,50,000
Add: Purchase		30,00,000
Less: Accumulated Depreciation	52,00,000	
Additional Depreciation	6,87,500	(58,87,500)
Closing balance of fixed assets		1,33,62,500

(7) Calculation of Closing Inventories:

$$\text{Average Inventories} = \frac{\text{Cost of Goods Sold}}{\text{Stock Turnover Ratio}} = \frac{₹\,1,23,75,000}{6} = ₹\,20,62,500$$

$$\text{Now, Average Inventories} = \frac{\text{Opening Inventories} + \text{Closing Inventories}}{2}$$

$$\text{Or, } ₹\,20,62,500 = \frac{₹\,20,00,000 + \text{Closing Inventories}}{2}$$

Or, Closing Inventories = ₹ 41,25,000 – ₹ 20,00,000

= ₹ 21,25,000

(8) Trade Receivables = Sales × 0.15 = ₹ 1,37,50,000 × 0.15

= ₹ 20,62,500

(9) Trade Payables = Material consumed × 0.20 = ₹ 55,00,000 × 0.20

= ₹ 11,00,000

(10) Calculation of Interest and Provision for Taxation:

	(₹)	(₹)
Operating profit (Working note 5)		13,75,000
Less: Interest on 10% Debentures (10% of ₹ 20,00,000)	(2,00,000)	
Less: Interest on 11% Debentures (11% of ₹ 5,50,000)	(60,500)	(2,60,500)
Profit before tax		11,14,500
Less: Provision for tax @ 30%		(3,34,350)
Profit after tax		7,80,150
Less: Preference share dividend (8% of ₹ 32,50,000)		(2,60,000)
Profit available for equity share holders		5,20,150
Less: Equity dividend paid (7% of ₹ 60,00,000)		(4,20,000)
Surplus to be transferred under the head Reserve & Surplus		1,00,150

(11) Reserve and surplus

Opening balance	₹ 14,00,000

Add: Surplus transferred (Working note 10) ₹ 1,00,150

₹ 15,00,150

(i) Statement of Projected Balance Sheet as at 31st March, 2022

Particulars	Note No.	2022 (₹)	2021 (₹)
I Equity and Liabilities:			
(1) Shareholders' funds			
(a) Equity Share Capital		95,00,000	60,00,000
(b) 8% Preference Share Capital		32,50,000	32,50,000
(c) Reserves and surplus		15,00,150	14,00,000
(2) Non-current liabilities			
(a) Long- term borrowings			
(i) 10% Debentures		20,00,000	20,00,000
(ii) 11% Debentures		5,50,000	--
(3) Current liabilities			
(a) Trade Payables		11,00,000	32,50,000
(b) Provision for Taxation		3,34,350	--
		1,82,34,500	1,59,00,000
II Assets:			
(1) Non-current assets			
(a) Fixed assets (tangible)		1,92,50,000	1,62,50,000
Less: Accumulated Depreciation		(58,87,500)	(52,00,000)
		1,33,62,500	1,10,50,000
(2) Current Assets			
(a) Inventories		21,25,000	20,00,000
(b) Trade receivable		20,62,500	26,00,000
(c) Cash and cash equivalents		6,84,500	2,50,000
		1,82,34,500	1,59,00,000

(ii) Statement of Projected Cash Flow for the year ended 31st March, 2022

	(₹)
Cash flow from Operating Activities	
Profit before taxation	11,14,500

Adjustments:	
Add: Depreciation	6,87,500
Operating profit before working capital changes	18,02,000
Increase in Inventories (₹ 21,25,000 – ₹ 20,00,000)	(1,25,000)
Decrease in Trade receivables (₹ 26,00,000 – ₹ 20,62,500)	5,37,500
Decrease in Trade payables (₹ 32,50,000 – ₹ 11,00,000)	(21,50,000)
Cash generated from operations	64,500
Less: Income tax paid	--
Net Cash from Operating activities (A)	64,500
Cash flow from Investing Activities	
Purchase of fixed assets	(30,00,000)
Net cash from Investing activities (B)	(30,00,000)
Cash Flow from Financing Activities	
Issue of equity shares	35,00,000
Issue of 11% Debenture	5,50,000
Dividend paid to equity share holders	(4,20,000)
Dividend paid to 8% Preference share holders	(2,60,000)
Net cash from Financing activities (C)	33,70,000
Net Increase/(Decrease) in cash and cash equivalents (A+B+C)	4,34,500
Cash and cash equivalent at the beginning of the year	2,50,000
Cash and cash equivalent at the end of the year	6,84,500

10. (i) Following are the reasons due to which Profit Maximization cannot be the sole objective of a company:

(a) The term profit is vague. It does not clarify what exactly it means. It conveys a different meaning to different people. For example, profit may be in short term or long-term period; it may be total profit or rate of profit etc.

(b) Profit maximisation has to be attempted with a realisation of risks involved. There is a direct relationship between risk and profit. Many risky propositions yield high profit. Higher the risk, higher is the possibility of profits. If profit maximisation is the only goal, then risk factor is altogether ignored. This implies that finance manager will accept highly risky proposals also, if they give high profits. In practice, however, risk is very important consideration and has to be balanced with the profit objective.

(c) Profit maximisation as an objective does not take into account the time pattern of returns. Proposal A may give a higher amount of profits as compared to proposal B, yet if the returns of proposal A begin to flow say 10 years later, proposal B may be preferred which may have lower overall profit but the returns flow is more early and quick.

(d) Profit maximisation as an objective is too narrow. It fails to take into account the social considerations as also the obligations to various interests of workers, consumers, society, as well as ethical trade practices. If these factors are ignored, a company cannot survive for long. Profit maximization at the cost of social and moral obligations is a short sighted policy.

(ii) Advantages and disadvantages of raising funds by issue of preference shares

Advantages

(i) No dilution in EPS on enlarged capital base – On the other hand if equity shares are issued it reduces EPS, thus affecting the market perception about the company.

(ii) There is also the advantage of leverage as it bears a fixed charge (because companies are required to pay a fixed rate of dividend in case of issue of preference shares). Non-payment of preference dividends does not force a company into liquidity.

(iii) There is no risk of takeover as the preference shareholders do not have voting rights except where dividend payment are in arrears.

(iv) The preference dividends are fixed and pre-decided. Hence preference shareholders cannot participate in surplus profits as the ordinary shareholders can except in case of participating preference shareholders.

(v) Preference capital can be redeemed after a specified period.

Disadvantages

(i) One of the major disadvantages of preference shares is that preference dividend is not tax deductible and so does not provide a tax shield to the company. Hence, preference shares are costlier to the company than debt e.g. debenture.

(ii) Preference dividends are cumulative in nature. This means that if in a particular year preference dividends are not paid they shall be accumulated and paid later. Also, if these dividends are not paid, no dividend can be paid to ordinary shareholders. The non-payment of dividend to ordinary shareholders could seriously impair the reputation of the concerned company.