PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I: COST ACCOUNTING

QUESTIONS

Material

1. The following data are available in respect of material X for the year ended 31st March, 2021:

	(₹)
Opening stock	9,00,000
Purchases during the year	1,70,00,000
Closing stock	11,00,000

(i) Calculate:

(a) Inventory turnover ratio, and

(b) The number of days for which the average inventory is held.

(ii) Interpret the ratio calculated as above if the industry inventory turnover rate is 10.

Labour

2. Textile Ltd. pays following overtime premium for its labour beside normal wages of ₹ 100 per hour:

Before and after normal working hours	80% of basic wage rate
Sundays and holidays	150% of basic wage rate

During the previous year 2019-20, the following hours were worked:

Normal time	3,00,000 hours
Overtime before and after normal working hours	60,000 hours
Overtime on Sundays and holidays	15,000 hours
Total	3,75,000 hours

During the current year 2020-21, the following hours have been worked on job 'Spinning':

Normal	4,000 hours
Overtime before and after normal working hours	400 hours
Overtime on Sundays and holidays	100 hours
Total	4,500 hours

You are required to Calculate the labour cost chargeable to job 'Spinning' and overhead in each of the following instances:

(a) Where overtime is worked regularly throughout the year as a policy due to the workers' shortage.

(b) Where overtime is worked irregularly to meet the requirements of production.

(c) Where overtime is worked at the request of the customer to expedite the job.

Overheads

3. PL 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 October, 2020:

	(₹)
Rent and rates	12,50,000
General lighting	1,50,000
Indirect Wages	3,75,000
Power	5,00,000
Depreciation on machinery	10,00,000
Insurance of machinery	4,00,000

Other Information:

	P_1	P_2	P_3	S_1	S_2
Direct wages (₹)	7,50,000	5,00,000	7,50,000	3,75,000	1,25,000
Horse Power of Machines used	60	30	50	10	–
Cost of machinery (₹)	60,00,000	80,00,000	1,00,00,000	5,00,000	5,00,000
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 of 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 ₹ 12,500 and direct labour cost is ₹ 7,500.

Non-Integrated Accounts

4. XYZ Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2020-21:

Particulars	**(₹ in '000)**
Opening balances:	
- Stores ledger control A/c	24,000
- Work-in-process control A/c	6,000
- Finished goods control A/c	1,29,000
- Building construction A/c	3,000
- Cost ledger control A/c	1,62,000
During the year following transactions took place:	
Materials:	
- Purchased	12,000
- Issued to production	15,000
- Issued to general maintenance	1,800
- Issued to building construction	1,200
Wages:	
- Gross wages paid	45,000
- Indirect wages paid	12,000
- For building construction	3,000

Factory overheads:	
- Actual amount incurred (excluding items shown above)	48,000
- Absorbed in building construction	6,000
- Under-absorbed	2,400
Royalty paid	1,500
Selling, distribution and administration overheads	7,500
Sales	1,35,000

At the end of the year, the stock of raw material and work-in-process was ₹ 1,65,00,000 and ₹ 75,00,000 respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales.

Required:

Prepare the relevant control accounts to record the above transactions in the cost ledger of the company.

Batch Costing

5. Rollon Ltd. is committed to supply 96,800 bearings per annum to Racing Ltd. on steady basis. It is estimated that it costs 25 paise as inventory carrying cost per bearing per month and the set-up cost per run of bearing manufacture is ₹ 588.

   (a) Compute what would be the optimum run size for bearing manufacture?

   (b) Assuming that the company has a policy of manufacturing 8,800 bearings per run, calculate how much extra costs the company would be incurring as compared to the optimum run suggested in (a) above?

Process Costing

6. Following information is available regarding Process-I of a manufacturing company for the month of February:

Production Record:

Units in process as on 1st February (All materials used, 1/4th complete for labour and overhead)	8,000
New units introduced	32,000
Units completed	28,000
Units in process as on 28th February (All materials used, 1/3rd complete for labour and overhead)	12,000

Cost Records:	(₹)
Work-in-process as on 1st February	
Materials	1,20,000
Labour	20,000
Overhead	20,000
	1,60,000
Cost during the month:	
Materials	5,12,000
Labour	3,00,000
Overhead	3,00,000
	11,12,000

Presuming that average method of inventory is used, Prepare the following:

(i) Statement of equivalent production.

(ii) Statement showing cost for each element.

(iii) Statement of apportionment of cost.

(iv) Process cost account for Process-I.

Operating Costing

7. Mr. PS owns a bus which runs according to the following schedule:

(i)	Delhi to Hisar and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	9
	Seating capacity occupied	90%.
(ii)	Delhi to Aligarh and back, the same day	
	Distance covered:	160 km. one way
	Number of days run each month:	12
	Seating capacity occupied	95%
(iii)	Delhi to Alwar and back, the same day	
	Distance covered:	170 km. one way
	Number of days run each month:	6
	Seating capacity occupied	100%
(iv)	Following are the other details:	
	Cost of the bus	₹ 15,00,000

Salary of the Driver	₹ 30,000 p.m.
Salary of the Conductor	₹ 26,000 p.m.
Salary of the part-time Accountant	₹ 7,000 p.m.
Insurance of the bus	₹ 6,000 p.a.
Diesel consumption 5 km. per litre at	₹ 90 per litre
Road tax	₹ 21,912 p.a.
Lubricant oil	₹ 30 per 100 km.
Permit fee	₹ 500 p.m.
Repairs and maintenance	₹ 5,000 p.m.
Depreciation of the bus	@ 30% p.a.
Seating capacity of the bus	50 persons

Passenger tax is 20% of the total takings.

Calculate the bus fare to be charged from each passenger to earn a profit of 30% on total takings.

The fares are to be indicated per passenger for the journeys: (i) Delhi to Hisar (ii) Delhi to Aligarh and (iii) Delhi to Alwar.

Standard Costing

8. BabyMoon Ltd. uses standard costing system in manufacturing one of its product 'Baby Cap'. The details are as follows:

Direct Material 1 Meter @ ₹ 60 per meter	₹ 60
Direct Labour 2 hour @ ₹ 20 per hour	₹ 40
Variable overhead 2 hour @ ₹ 10 per hour	₹ 20
Total	₹ 120

During the month of August, 10,000 units of 'Baby Cap' were manufactured. Details are as follows:

Direct material consumed	11,400 meters	@	₹ 58 per meter	
Direct labour Hours	?	@	?	₹ 4,48,800
Variable overhead incurred				₹ 2,24,400

Variable overhead efficiency variance is ₹ 4,000 A. Variable overheads are based on Direct Labour Hours.

You are required to Calculate the following Variances:

(a) Material Variances- Material Cost Variance, Material Price Variance and Material Usage Variance.

(b) Variable Overheads variances- Variable overhead Cost Variance, Variable overhead Efficiency Variance and Variable overhead Expenditure Variance.

(c) Labour variances- Labour Cost Variance, Labour Rate Variance and Labour Efficiency Variance.

Marginal Costing

9. A company has three factories situated in North, East and South with its Head Office in Mumbai. The Management has received the following summary report on the operations of each factory for a period:

(₹ in '000)

Factory	Sales		Profit	
	Actual	Over / (Under) Budget	Actual	Over / (Under) Budget
North	1,100	(400)	135	(180)
East	1,450	150	210	90
South	1,200	(200)	330	(110)

Calculate the following for each factory and for the company as a whole for the period:

(i) Fixed Cost

(ii) Break-even Sales

Budget and Budgetary Control

10. The accountant of manufacturing company provides you the following details for year 2019-20:

Particulars	(₹)
Direct materials	28,00,000
Direct Wages	16,00,000
Fixed factory overheads	16,00,000
Variable factory overheads	16,00,000
Other variable costs	12,80,000
Other fixed costs	12,80,000
Profit	18,40,000
Sales	1,20,00,000

During the year, the company manufactured two products A and B and the output and costs were:

Particulars	A	B
Output (units)	2,00,000	1,00,000
Selling price per unit	₹ 32.00	₹ 56.00
Direct materials per unit	₹ 8.00	₹ 12.00
Direct wages per unit	₹ 4.00	₹ 8.00

Variable factory overhead is absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹ 4.00 per unit; and B ₹ 4.80 per unit.

During 2020-21, it is expected that the demand for product A will fall by 25% and for B by 50%. It is decided to manufacture a new product C, the cost for which is estimated as follows:

Particulars	Product C
Output (units)	2,00,000
Selling price per unit	₹ 28.00
Direct materials per unit	₹ 6.40
Direct wages per unit	₹ 4.00

It is anticipated that the other variable costs per unit of Product C will be same as for product A.

Prepare a budget to present to the management, showing the current position and the position for 2020-21. Comment on the comparative results.

Miscellaneous

11. (a) Differentiate between Cost Control and Cost Reduction.

(b) 'Like other branches of accounting, cost accounting also has certain limitations.' Explain the limitations.

(c) Differentiate between Job Costing and Process Costing.

(d) Discuss the treatment of by-product cost in Cost Accounting when they are of small total value.

SUGGESTED ANSWERS

1. (i) (a) Inventory turnover ratio (Refer to working note)

$$= \frac{\text{Cost of stock of raw material consumed}}{\text{Average stock of raw material}}$$

$$= \frac{₹\,1,68,00,000}{₹\,10,00,000} = 16.8$$

(b) Average number of days for which the average inventory is held

$$= \frac{365}{\text{Inventory turnover ratio}} = \frac{365\,\text{days}}{16.8} = 21.73 \text{ days}$$

Working Note:

Particulars	(₹)
Opening stock of raw material	9,00,000
Add: Material purchases during the year	1,70,00,000
Less: Closing stock of raw material	11,00,000
	1,68,00,000

(ii) The Inventory turnover ratio for material X is 16.8 which mean an inventory item takes only 21.73 or 22 days to issue from stores for production process. The rate is better than the industry rate which is 10 time or 36.5 days. This inventory turnover ratio indicates better inventory management system and good demand for the final product in market.

2. Workings:

Basic wage rate = ₹ 100 per hour

Overtime wage rate before and after working hours = ₹ 100 + (₹ 100 × 80%)

= ₹ 180 per hour

Overtime wage rate for Sundays and holidays = ₹ 100 + (₹ 100 × 150%)

= ₹ 250 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	Amount (₹)
Annual wages for the previous year for normal time (3,00,000 hrs. × ₹ 100)	3,00,00,000

Wages for overtime before and after normal working hours (60,000 hrs. × ₹ 180)	108,00,000
Wages for overtime on Sundays and holidays (15,000 hrs. × ₹ 250)	37,50,000
Total wages for 3,75,000 hrs.	**4,45,50,000**

Average inflated wage rate = $\frac{₹\ 4,45,50,000}{3,75,000\ hours}$ = ₹ 118.80

(a) Where overtime is worked regularly as a policy due to workers' shortage

The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate. Hence, employee cost chargeable to job 'Spinning'

= Total hours × Inflated wage rate = 4,500hrs. × ₹ 118.80 = ₹ **5,34,600**

(b) Where overtime is worked irregularly to meet the requirements of production

Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:

Employee cost chargeable to Job 'Spinning' = 4,500hours @ ₹ 100 per hour

= ₹ 4,50,000

Factory overhead = {400 hrs. × (₹ 100 × 80%)} + {100 hrs. × (₹ 100 × 150%)}

= {₹ 32,000 + ₹ 15,000} = ₹ **47,000**

(c) Where overtime is worked at the request of the customer, overtime premium is also charged to the job as under

		(₹)
Job 'Spinning' Employee cost: 4,500hrs. @ ₹ 100	=	4,50,000
Overtime premium: 400 hrs. @ (₹ 100 × 80%)	=	32,000
100 hrs. @ (₹ 100 × 150%)	=	15,000
Total		**4,97,000**

3. Primary Distribution Summary

Item of cost	Basis of apportionment	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)	S_1 (₹)	S_2 (₹)
Direct wages	Actual	5,00,000	--	--	--	3,75,000	1,25,000
Rent and Rates	Floor area (4:5:6:4:1)	12,50,000	2,50,000	3,12,500	3,75,000	2,50,000	62,500
General lighting	Light points (2:3:4:2:1)	1,50,000	25,000	37,500	50,000	25,000	12,500

Indirect wages	Direct wages (6:4:6:3:1)	3,75,000	1,12,500	75,000	1,12,500	56,250	18,750
Power	Horse Power of machines used (6:3:5:1)	5,00,000	2,00,000	1,00,000	1,66,667	33,333	–
Depreciation of machinery	Value of machinery (12:16:20:1:1)	10,00,000	2,40,000	3,20,000	4,00,000	20,000	20,000
Insurance of machinery	Value of machinery (12:16:20:1:1)	4,00,000	96,000	1,28,000	1,60,000	8,000	8,000
		41,75,000	**9,23,500**	**9,73,000**	**12,64,167**	**7,67,583**	**2,46,750**

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.

$S_1 = 7,67,583 + 0.10\ S_2$

$S_2 = 2,46,750 + 0.10\ S_1$

Substituting the value of S_2 in S_1 we get

$S_1 = 7,67,583 + 0.10\ (2,46,750 + 0.10\ S_1)$

$S_1 = 7,67,583 + 24,675 + 0.01\ S_1$

$0.99\ S_1 = 7,92,258$

$\therefore S_1 = ₹\ 8,00,260$

$\therefore S_2 = 2,46,750 + 0.10 \times 8,00,260$

$= ₹\ 3,26,776$

Secondary Distribution Summary

Particulars	Total (₹)	P_1 (₹)	P_2 (₹)	P_3 (₹)
Allocated and Apportioned over-heads as per primary distribution	31,60,667	9,23,500	9,73,000	12,64,167
S_1	8,00,260	1,60,052	2,40,078	3,20,104
S_2	3,26,776	1,30,710	65,355	98,033
		12,14,262	**12,78,433**	**16,82,304**

(i) Overhead rate per hour

	P_1	P_2	P_3
Total overheads cost (₹)	12,14,262	12,78,433	16,82,304
Production hours worked	6,225	4,050	4,100
Rate per hour (₹)	**195.06**	**315.67**	**410.32**

(ii) Cost of Product X

	(₹)
Direct material	12,500.00
Direct labour	7,500.00
Prime cost	**20,000.00**
Production on overheads	
P_1 5 hours × ₹ 195.06 = 975.30	
P_2 3 hours × ₹ 315.67 = 947.01	
P_3 4 hours × ₹ 410.32 = 1,641.28	3,563.59
Factory cost	**23,563.59**

4. Cost Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Costing P&L A/c	1,35,000	By Balance b/d	1,62,000
To Building Construction A/c	13,200	By Stores Ledger control A/c	12,000
To Balance c/d	1,44,900	By Wages Control A/c	45,000
		By Factory overhead control A/c	48,000
		By Royalty A/c	1,500
		By Selling, Distribution and Administration overheads	7,500
		By Costing P&L A/c	17,100
	2,93,100		2,93,100

Stores Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	24,000	By WIP control A/c	15,000

To Cost Ledger control A/c	12,000	By Factory overheads control A/c	1,800
		By Building construction A/c	1,200
		By Factory overhead control A/c (bal. fig.) (loss)	1,500
		By Balance c/d	16,500
	36,000		36,000

Wages Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	45,000	By Factory overhead control A/c	12,000
		By Building Construction A/c	3,000
		By WIP Control A/c (bal. fig.)	30,000
	45,000		45,000

Factory Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Stores Ledger control A/c	1,800	By Building Construction A/c	6,000
To Wages Control A/c	12,000	By WIP Control A/c (bal. fig.)	54,900
To Cost Ledger control A/c	48,000	By Costing P&L A/c (under-absorption)	2,400
To Stores Ledger control A/c (loss)	1,500		
	63,300		63,300

Royalty Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	1,500	By WIP Control A/c	1,500
	1,500		1,500

Work-in-process Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	6,000	By Finished goods control A/c (bal. fig.)	99,900
To Stores Ledger control A/c	15,000		
To Wages Control A/c	30,000		

To Factory overhead control A/c	54,900		
To Royalty A/c	1,500	By Balance c/d	7,500
	1,07,400		1,07,400

Finished Goods Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	1,29,000	By Cost of Goods Sold A/c (Refer working note)	1,08,000
To WIP control A/c	99,900	By Balance c/d	1,20,900
	2,28,900		2,28,900

Cost of Goods Sold Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Finished Goods control A/c	1,08,000	By Cost of sales A/c	1,08,000
	1,08,000		1,08,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	7,500	By Cost of sales A/c	7,500
	7,500		7,500

Cost of Sales Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Goods Sold A/c	1,08,000	By Costing P&L A/c	1,15,500
To Selling, Distribution and Administration A/c	7,500		
	1,15,500		1,15,500

Costing P&L Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Sales A/c	1,15,500	By Cost Ledger control A/c	1,35,000
To Factory overhead control A/c	2,400		
To Cost Ledger control A/c (bal. fig.) (Profit)	17,100		
	1,35,000		1,35,000

Building Construction Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	3,000	By Cost Ledger control A/c	13,200
To Stores Ledger control A/c	1,200		
To Wages Control A/c	3,000		
To Factory overhead control A/c	6,000		
	13,200		13,200

Trial Balance

Particulars	Dr.	Cr.
	(₹ in '000)	(₹ in '000)
Stores Ledger Control A/c	16,500	
WIP Control A/c	7,500	
Finished Goods Control A/c	1,20,900	
Cost Ledger Control A/c		1,44,900
	1,44,900	1,44,900

Workings:

Cost of Goods sold = $\frac{₹\ 13,50,00,000 \times 80}{100}$ = ₹ 10,80,00,000

5. (a) Optimum production run size (Q)

$$= \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 96,800 \times ₹\ 588}{0.25 \times 12}} = 6,160 \text{ bearings.}$$

(b) Calculation of Extra Cost

Total Cost (of maintaining the inventories) when production run size (Q) are 6,160 and 8,800 bearings respectively.

Total cost = Total set-up cost + Total carrying cost.

Particulars	When run size is 6,160 bearings	When run size is 8,800 bearings
Total set up cost	= $\frac{96,800}{6,160}$ × ₹ 588 = ₹ 9,240 Or, No. of setups = 15.71 (16	= $\frac{96,800}{8,800}$ × ₹ 588 = ₹ 6,468

	setups) = 16 x ₹ 588 = ₹ 9,408	
Total Carrying cost	½ × 6,160 × 0.25 × 12 = ₹ 9,240	½ × 8,800 × 0.25 × 12 = ₹ 13,200
Total Cost	₹ **18,480/** ₹ **18,648**	₹ **19,668**

₹ 1,188/ ₹ 1,020 is the extra cost incurred by the company due to run size not being optimum run size.

6. (i) Statement of equivalent production (Average cost method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	8,000	Completed and transferred	28,000	100	28,000	100	28,000
Units introduced	32,000	Closing WIP	12,000	100	12,000	1/3rd	4,000
	40,000		40,000		40,000		32,000

(ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	1,20,000	20,000	20,000	1,60,000
Cost incurred during the month	5,12,000	3,00,000	3,00,000	11,12,000
Total cost: (A)	6,32,000	3,20,000	3,20,000	12,72,000
Equivalent units: (B)	40,000	32,000	32,000	
Cost per equivalent unit: (C) = (A ÷ B)	15.8	10	10	35.8

(iii) Statement of apportionment of cost

	Particulars	Amount (₹)	Amount (₹)
1.	Value of units completed and transferred (28,000 units × ₹ 35.8)		10,02,400
2.	Value of Closing W-I-P:		
	- Materials (12,000 units × ₹ 15.8)	1,89,600	

- Labour (4,000 units × ₹ 10)	40,000	
- Overheads (4,000 units × ₹ 10)	40,000	2,69,600

(iv) Process-I Cost Account

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W-I-P	8,000	1,60,000	By Completed units	28,000	10,02,400
To Materials	32,000	5,12,000	By Closing W-I-P	12,000	2,69,600
To Labour	--	3,00,000			
To Overhead	--	3,00,000			
	40,000	12,72,000		40,000	12,72,000

7. Working Notes:

1. Total Distance (in km.) covered per month

Bus route	Km. per trip	Trips per day	Days per month	Km. per month
Delhi to Hisar	160	2	9	2,880
Delhi to Aligarh	160	2	12	3,840
Delhi to Alwar	170	2	6	2,040
Total				8,760

2. Passenger- km. per month

	Total seats available per month (at 100% capacity)	Capacity utilised		Km. per trip	Passenger-Km. per month
		(%)	Seats		
Delhi to Hisar & Back	900 (50 seats × 2 trips × 9 days)	90	810	160	1,29,600 (810 seats × 160 km.)
Delhi to Aligarh & Back	1,200 (50 seats × 2 trips × 12 days)	95	1,140	160	1,82,400 (1,140 seats × 160 km.)
Delhi to Alwar & Back	600 (50 seats × 2 trips × 6 days)	100	600	170	1,02,000 (600 seats × 170 km.)
Total					4,14,000

Monthly Operating Cost Statement

Particulars	(₹)	(₹)
(i) Running Costs		
Diesel {(8,760 km ÷ 5 km) × ₹ 90}	1,57,680.00	
Lubricant oil {(8,760 km ÷ 100) × ₹ 30}	2,628.00	1,60,308.00
(ii) Maintenance Costs		
Repairs & Maintenance		5,000.00
(iii) Standing charges		
Salary to driver	30,000.00	
Salary to conductor	26,000.00	
Salary of part-time accountant	7,000.00	
Insurance (₹ 6,000 ÷12)	500.00	
Road tax (₹ 21,912 ÷12)	1,826.00	
Permit fee	500.00	
Depreciation {(₹ 15,00,000 × 30%) ÷ 12}	37,500.00	1,03,326.00
Total costs per month before Passenger Tax (i)+(ii)+(iii)		2,68,634.00
Passenger Tax*		1,07,453.60
Total Cost		3,76,087.60
Add: Profit*		1,61,180.40
Total takings per month		5,37,268.00

*Let total takings be X then,

X = Total costs per month before passenger tax + 0.2 X (passenger tax) + 0.3 X (profit)

X = ₹ 2,68,634 + 0.2 X + 0.3 X

0.5 X = ₹ 2,68,634 or, X = ₹ 5,37,268

Passenger Tax = 20% of ₹ 5,37,268= ₹ 1,07,453.60

Profit = 30% of ₹ 5,37,268 = ₹ 1,61,180.40

Calculation of Rate per passenger km. and fares to be charged for different routes

$$\textbf{Rate per Passenger-Km.} = \frac{\text{Total takings per month}}{\text{Total Passenger-Km. per month}}$$

$$= \frac{₹\ 5,37,268}{4,14,000\ \text{Passenger-Km.}} = ₹\ 1.30\ (\text{approx.})$$

Bus fare to be charged per passenger:

Delhi to Hisar	=	₹ 1.30 × 160 km	=	₹ 208.00
Delhi to Aligarh	=	₹ 1.30 × 160 km	=	₹ 208.00
Delhi to Alwar	=	₹ 1.30 × 170 km	=	₹ 221.00

8. (i) Material Variances

Budget			Std. for actual			Actual		
Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)
1	60	60	10,000	60	6,00,000	11,400	58	6,61,200

Material Cost Variance = (SQ × SP – AQ × AP)

= 6,00,000 – 6,61,200 = ₹ 61,200 (A)

Material Price Variance = (SP – AP) AQ

= (60 - 58) 11,400 = ₹ 22,800 (F)

Material Usage Variance = (SQ – AQ) SP

= (10,000 – 11,400) 60 = ₹ 84,000 (A)

(ii) Variable Overheads variances

Variable overhead Cost Variance

= Standard variable overhead – Actual Variable Overhead

= (10,000 units × 2 hours × ₹ 10) – 2,24,400 = ₹ 24,400 (A)

Variable overhead Efficiency Variance

= (Standard Hours – Actual Hours) × Standard Rate per Hour

Let Actual Hours be 'X', then:

(20,000 – X) × 10 = 4,000 (A)

2,00,000 – 10X = - 4,000

X = 2,04,000 ÷ 10

Therefore, Actual Hours (X) = 20,400

Variable overhead Expenditure Variance

= Variable Overhead at Actual Hours - Actual Variable Overheads

= 20,400 × ₹ 10 – 2,24,400 = ₹ 20,400 (A)

(iii) Labour variances

Budget			Std. for actual			Actual		
Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
2	20	40	20,000	20	4,00,000	20,400	22*	4,48,800

*Actual Rate = ₹ 4,48,800 ÷ 20,400 hours = ₹ 22

Labour Cost Variance = (SH × SR) – (AH × AR)

= 4,00,000 – 4,48,800 = ₹ 48,800 (A)

Labour Rate Variance = (SR – AR) × AH

= (20 – 22) × 20,400 = ₹ 40,800 (A)

Labour Efficiency Variance = (SH – AH) × SR

= (20,000 – 20,400) × 20 = ₹ 8,000 (A)

9. Computation of Profit Volume Ratio

(₹ in '000)

Factory	Sales			Profit			P/V Ratio $\left(\frac{\text{Change in Profit}}{\text{Change in Sales}}\right)$
	Actual	Over / (Under) Budget	Budgeted Sales	Actual	Over /(Under) Budget	Budget Profit	
North	1,100	(400)	1,500	135	(180)	315	45%
East	1,450	150	1,300	210	90	120	60%
South	1,200	(200)	1,400	330	(110)	440	55%

(i) Computation of Fixed Costs

(₹ in '000)

Factory	Actual Sales	P/V Ratio	Contribution	Actual Profit	Fixed Cost
	(1)	(2)	(3) = (1) × (2)	(4)	(5) = (3) - (4)
North	1,100	45%	495	135	360
East	1,450	60%	870	210	660

South	1,200	55%	660	330	**330**
Total	3,750		2,025	675	**1,350**

(ii) Computation of Break-Even Sales

Factory	Fixed Cost (a)	P/V Ratio (b)	Break-even Sales (a) / (b)
North	360	45%	800
East	660	60%	1,100
South	330	55%	600
			2,500

$$\text{Break-even Sales (Company as Whole)} = \frac{\text{Fixed Cost}}{\text{Composite P / V Ratio *}}$$

$$= \frac{₹\ 13,50,000}{54\%}$$

$$= ₹\ 25,00,000$$

$$\text{*Composite P/V Ratio} = \frac{\text{Total Contribution}}{\text{Total Actual sales}} = \frac{2,025}{3,750} = 54\%$$

10. Budget Showing Current Position and Position for 2020-21

	Position for 2019-20			Position for 2020-21			
	A	B	Total (A+B)	A	B	C	Total (A+B+C)
Sales (units)	2,00,000	1,00,000	–	1,50,000	50,000	2,00,000	–
	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
(A) Sales	**64,00,000**	**56,00,000**	**1,20,00,000**	**48,00,000**	**28,00,000**	**56,00,000**	**1,32,00,000**
Direct Material	16,00,000	12,00,000	28,00,000	12,00,000	6,00,000	12,80,000	30,80,000
Direct wages	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Factory overhead (variable)	8,00,000	8,00,000	16,00,000	6,00,000	4,00,000	8,00,000	18,00,000
Other variable costs	800,000	4,80,000	12,80,000	6,00,000	240,000	8,00,000	16,40,000
(B) Marginal Cost	40,00,000	32,80,000	72,80,000	30,00,000	16,40,000	36,80,000	83,20,000
(C) Contribution (A-B)	**24,00,000**	**23,20,000**	**47,20,000**	**18,00,000**	**11,60,000**	**19,20,000**	**48,80,000**

Fixed costs				
– Factory		16,00,000		16,00,000
– Others		12,80,000		12,80,000
(D) Total fixed cost		28,80,000		28,80,000
Profit (C – D)		**18,40,000**		**20,00,000**

Comments: Introduction of Product C is likely to increase profit by ₹ 1,60,000 (i.e. from ₹ 18,40,000 to ₹ 20,00,000) in 2020-21 as compared to 2019-20 even if the demand for Product A & B falls. Therefore, introduction of product C is recommended.

11. (a)

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

(b) "Like other branches of accounting, cost accounting also has certain limitations". The limitations of cost accounting are as follows:

(i) Expensive: It is expensive because analysis, allocation and absorption of overheads requires considerable amount of additional work, and hence additional money.

(ii) Requirement of reconciliation: The results shown by cost accounts differ from those shown by financial accounts. Thus, preparation of reconciliation statements is necessary to verify their accuracy.

(iii) Duplication of work: It involves duplication of work as organization has to maintain two sets of accounts i.e. Financial Accounts and Cost Accounts.

(c)

Job Costing	Process Costing
(i) A Job is carried out or a product is produced by specific orders.	The process of producing the product has a continuous flow and the product produced is homogeneous.
(ii) Costs are determined for each job.	Costs are compiled on time basis i.e., for production of a given accounting period for each process or department.
(iii) Each job is separate and independent of other jobs.	Products lose their individual identity as they are manufactured in a continuous flow.
(iv) Each job or order has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
(v) Costs are computed when a job is completed. The cost of a job may be determined by adding all costs against the job.	Costs are calculated at the end of the cost period. The unit cost of a process may be computed by dividing the total cost for the period by the output of the process during that period.
(vi) As production is not continuous and each job may be different, so more managerial attention is required for effective control.	Process of production is usually standardized and is therefore, quite stable. Hence control here is comparatively easier.

(d) 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:

(i) 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.

(ii) 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.

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. Following information has been gathered from the books of Cram Ltd. for the year ended 31st March 2021, the equity shares of which is trading in the stock market at ₹ 28:

Particulars	Amount (₹)
Equity Share Capital (Face value @ ₹ 20)	20,00,000
10% Preference Share capital	4,00,000
Reserves & Surplus	16,00,000
12.5% Debentures	12,00,000
Profit before Interest and Tax for the year	8,00,000

Calculate the following when company falls within 25% tax bracket:

(i) Return on Capital Employed

(ii) Earnings Per share

(iii) P/E Ratio

Cost of Capital

3. Kalyanam Ltd. has an operating profit of ₹ 34,50,000 and has employed Debt which gives total Interest Charge of ₹ 7,50,000. The firm has an existing Cost of Equity and Cost of Debt as 16% and 8% respectively. The firm has a new proposal before it, which requires funds of ₹ 75 Lakhs and is expected to bring an additional profit of ₹ 14,25,000. To finance the proposal, the firm is expecting to issue an additional debt at 8% and will not be issuing any new equity shares in the market. Assume no tax culture.

You are required to calculate the Weighted Average Cost of Capital (WACC) of Kalyanam Ltd.:

(i) Before the new Proposal

(ii) After the new Proposal

Capital Structure

4. Blue Ltd., an all equity financed company is considering the repurchase of ₹ 275 lakhs equity shares and to replace it with 15% debentures of the same amount. Current market value of the company is ₹ 1,750 lakhs with its cost of capital of 20%. The company's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future years. The company also has a policy of distributing its entire earnings as dividend.

   Assuming the corporate tax rate as 30%, you are required to CALCULATE the impact on the following on account of the change in the capital structure as per Modigliani and Miller (MM) Approach:

   (i) Market value of the company

   (ii) Overall Cost of capital

   (iii) Cost of equity

Leverage

5. The following particulars relating to Navya Ltd. for the year ended 31st March 2021 is given:

Output	1,00,000 units at normal capacity
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March, 2021 is as follows:

Particulars	**₹**
Equity share capital (1,00,000 shares of ₹ 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	**30,00,000**

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve ₹ 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

(i) Entirely by equity shares of ₹ 10 each at par.

(ii) ₹ 5 lakh by issue of equity shares of ₹ 10 each and the balance by issue of 6% debentures of ₹ 100 each at par.

(iii) Entirely by 6% debentures of ₹ 100 each at par.

Find out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

Capital Budgeting

6. HMR Ltd. is considering replacing a manually operated old machine with a fully automatic new machine. The old machine had been fully depreciated for tax purpose but has a book value of ₹ 2,40,000 on 31st March 2021. The machine has begun causing problems with breakdowns and it cannot fetch more than ₹ 30,000 if sold in the market at present. It will have no realizable value after 10 years. The company has been offered ₹ 1,00,000 for the old machine as a trade in on the new machine which has a price (before allowance for trade in) of ₹ 4,50,000. The expected life of new machine is 10 years with salvage value of ₹ 35,000.

Further, the company follows straight line depreciation method but for tax purpose, written down value method depreciation @ 7.5% is allowed taking that this is the only machine in the block of assets.

Given below are the expected sales and costs from both old and new machine:

	Old machine (₹)	New machine (₹)
Sales	8,10,000	8,10,000
Material cost	1,80,000	1,26,250
Labour cost	1,35,000	1,10,000
Variable overhead	56,250	47,500
Fixed overhead	90,000	97,500
Depreciation	24,000	41,500
PBT	3,24,750	3,87,250
Tax @ 30%	97,425	1,16,175
PAT	2,27,325	2,71,075

From the above information, analyse whether the old machine should be replaced or not if required rate of return is 10%? Ignore capital gain tax.

PV factors @ 10%:

Year	1	2	3	4	5	6	7	8	9	10
PVF	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386

Management of Receivables (Debtors)

7. The Alliance Ltd., a Petrochemical sector company had just invested huge amount in its new expansion project. Due to huge capital investment, the company is in need of an additional ₹ 1,50,000 in working capital immediately. The Finance Manger has determined the following three feasible sources of working capital funds:

   (i) Bank loan: The Company's bank will lend ₹ 2,00,000 at 15%. A 10% compensating balance will be required, which otherwise would not be maintained by the company.

   (ii) Trade credit: The company has been offered credit terms from its major supplier of 3/30, net 90 for purchasing raw materials worth ₹ 1,00,000 per month.

   (iii) Factoring: A factoring firm will buy the company's receivables of ₹ 2,00,000 per month, which have a collection period of 60 days. The factor will advance up to 75% of the face value of the receivables at 12% on an annual basis. The factor will also charge commission of 2% on all receivables purchased. It has been estimated that the factor's services will save the company a credit department expense and bad debt expense of ₹ 1,250 and ₹ 1,750 per month respectively.

   On the basis of annual percentage cost, advise which alternative should the company select? Assume 360 days year.

Management of working Capital

8. The management of Trux Company Ltd. is planning to expand its business and consults you to prepare an estimated working capital statement. The records of the company reveals the following annual information:

	(₹)
Sales – Domestic at one month's credit	18,00,000
Export at three month's credit (sales price 10% below domestic price)	8,10,000
Materials used (suppliers extend two months credit)	6,75,000
Lag in payment of wages – ½ month	5,40,000
Lag in payment of manufacturing expenses (cash) – 1 month	7,65,000
Lag in payment of Administration Expenses – 1 month	1,80,000
Selling expenses payable quarterly in advance	1,12,500
Income tax payable in four installments, of which one falls in the next financial year	1,68,000

Rate of gross profit is 20%. Ignore work-in-progress and depreciation.

The company keeps one month's stock of raw materials and finished goods (each) and believes in keeping ₹ 2,50,000 available to it including the overdraft limit of ₹ 75,000 not yet utilized by the company.

The management is also of the opinion to make 10% margin for contingencies on computed figure.

You are required to prepare the estimated working capital statement for the next year.

Cash Flow Statement

9. Balance Sheets of a company as on 31st March, 2020 and 2021 were as follows:

Particulars	Note No.	2021	2020
I Equity and Liabilities:			
(1) Shareholders' funds			
(a) Equity Share Capital		10,00,000	10,00,000
(b) 8% Preference Share Capital		3,00,000	2,00,000
(c) Reserves and surplus			
(i) Securities Premium Reserve		25,000	--
(ii) General Reserve		1,45,000	1,20,000
(iii) Surplus (Bal. in Statement of P&L)		3,00,000	2,10,000
(2) Non-current liabilities			
(a) Long- term borrowings			
(ii) 11% Debentures		3,00,000	5,00,000
(3) Current liabilities			
(a) Trade Payables		2,15,000	1,85,000
(b) Provision for Taxation		1,05,000	80,000
(c) Proposed dividend		1,44,000	1,36,000
Total		25,34,000	24,31,000
II Assets:			
(1) Non-current assets			
(a) Fixed assets (tangible):			
(i) Land and Building		6,50,000	7,00,000
(ii) Plant and Machinery		6,60,000	6,00,000
(b) Fixed assets (Intangible):			
(i) Goodwill		80,000	1,00,000
(c) Non-current investments		2,20,000	2,40,000

(2) Current Assets			
(a) Inventories		3,85,000	4,00,000
(b) Trade receivable		4,15,000	2,88,000
(c) Cash and cash equivalents		93,000	88,000
(d) Other current assets			
(i) Prepaid expenses		11,000	15,000
(ii) Premium on redemption of debentures		20,000	--
		25,34,000	24,31,000

Additional Information:

1. Investments were sold during the year at a profit of ₹ 15,000.
2. During the year an old machine costing ₹ 80,000 was sold for ₹ 36,000. Its written down value was ₹ 45,000.
3. Depreciation charged on Plants and Machinery @ 20 per cent on the opening balance.
4. There was no purchase or sale of Land and Building.
5. Provision for tax made during the year was ₹ 96,000.
6. Preference shares were issued for consideration of cash during the year.
7. Proposed dividend as at 31st March 2020 and 2021 are ₹ 1,36,000 and ₹ 1,44,000 respectively.

You are required to prepare:

(i) Cash flow statement as per AS 3.

(ii) Schedule of Changes in Working Capital.

Miscellaneous

10. (a) Discuss the points that demonstrates the Importance of good financial management.

(b) Explain some common methods of Venture capital financing.

SUGGESTED 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 $2 \times 0.06 = 12$ percent.

I = 6% for half year

I = 12% for full year.

Therefore, Rate of Interest = 12% per annum

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

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

Revised Maturity Value = ₹ 12,670

2. (i) Return on Capital Employed (ROCE)

$$\text{ROCE (Pre-tax)} = \frac{\text{Profit before interest and taxes (PBIT)}}{\text{Capital Employed}} \times 100$$

$$= \frac{₹\ 8,00,000}{₹\ 52,00,000} \times 100$$

= 15.38% (approx.)

$$\text{ROCE (Post-tax)} = \frac{\text{PBIT}(1-t)}{\text{Capital Employed}} \times 100$$

$$= \frac{₹\ 8,00,000\ (1-0.25)}{₹\ 52,00,000} \times 100$$

= 11.54% (approx.)

(ii) Earnings Per share (EPS)

$$= \frac{\text{Profit available to equity share holders}}{\text{Number of equity shares outstanding}}$$

$$= \frac{₹\ 4,47,500}{1,00,000}$$

= ₹ 4.475

(iii) P/E Ratio

$$= \frac{\text{Market Price per Share (MPS)}}{\text{Earning per Share (EPS)}}$$

$$= \frac{₹\ 28}{₹\ 4.475}$$

= 6.26 times (approx.)

Workings:

(a) Income Statement

Particulars	Amount (₹)
Profit before Interest and Tax (PBIT)	8,00,000
Interest on Debentures (12.5% of ₹ 12,00,000)	(1,50,000)
Profit before Tax (PBT)	6,50,000
Tax @ 25%	(1,62,500)
Profit after Tax (PAT)	4,87,500
Preference Dividend (10% of ₹ 4,00,000)	(40,000)
Profit available to Equity shareholders	4,47,500

(b) Calculation of Capital Employed

= Equity Shareholder's Fund + Preference share Capital + Debentures

= (₹ 20,00,000 + ₹ 16,00,000) + ₹ 4,00,000 + ₹ 12,00,000 = ₹ 52,00,000

3. Workings:

(a) Value of Debt $= \frac{\text{Interest}}{\text{Cost of debt } (K_d)}$

$= \frac{₹\ 7,50,000}{0.08} = ₹\ 93,75,000$

(b) Value of equity capital $= \frac{\text{Operating profit - Interest}}{\text{Cost of equity } (K_e)}$

$= \frac{₹\ 34,50,000 - ₹\ 7,50,000}{0.16} = ₹\ 1,68,75,000$

(c) New Cost of equity (K_e) after proposal

$= \frac{\text{Increased Operating profit - Interest on Increased debt}}{\text{Equity capital}}$

$= \frac{(₹\ 34,50,000 + ₹\ 14,25,000) - (₹\ 7,50,000 + ₹\ 6,00,000)}{₹\ 1,68,75,000}$

$= \frac{₹\ 48,75,000 - ₹\ 13,50,000}{₹\ 1,68,75,000} = \frac{₹\ 35,25,000}{₹\ 1,68,75,000} = 0.209 \text{ or } 20.9\%$

(i) Calculation of Weighted Average Cost of Capital (WACC) before the new proposal

Sources	Amount (₹)	Weight	Cost of Capital	WACC
Equity	1,68,75,000	0.6429	0.160	0.1029
Debt	93,75,000	0.3571	0.080	0.0286
Total	**2,62,50,000**	**1**		**0.1315 or 13.15%**

(ii) Calculation of Weighted Average Cost of Capital (WACC) after the new proposal

Sources	Amount (₹)	Weight	Cost of Capital	WACC
Equity	1,68,75,000	0.5000	0.209	0.1045
Debt	1,68,75,000	0.5000	0.080	0.0400
Total	**3,37,50,000**	**1**		**0.1445 or 14.45%**

4. Workings:

Market Value of Equity $= \frac{\text{Net income (NI) for equity holders}}{K_e}$

₹ 1,750 lakhs $= \frac{\text{Net income (NI) for equity holders}}{0.20}$

Net Income to equity holders/EAT = ₹ 350 lakhs

Therefore, EBIT = $\frac{EAT}{(1-t)} = \frac{₹\ 350\ lakhs}{(1-0.3)}$ = ₹ 500 lakhs

Income Statement

	All Equity (₹ In lakhs)	Equity & Debt (₹ In lakhs)
EBIT (as calculated above)	500	500
Interest on ₹ 275 lakhs @ 15%	--	41.25
EBT	500	458.75
Tax @ 30%	150	137.63
Income available to equity holders	350	321.12

(i) Market value of the company

Market value of levered firm = Value of unlevered firm + Tax Advantage

= ₹ 1,750 lakhs + (₹ 275 lakhs x 0.3)

= ₹ 1,832.5 lakhs

Change in market value of the company = ₹ 1,832.5 lakhs – ₹ 1,750 lakhs

= ₹ 82.50 lakhs

The impact is that the market value of the company has increased by ₹ 82.50 lakhs due to replacement of equity with debt.

(ii) Overall Cost of Capital

Market Value of Equity = Market value of levered firm - Equity repurchased

= ₹ 1,832.50 lakhs – ₹ 275 lakhs = ₹ 1,557.50 lakhs

Cost of Equity (K_e) = (Net Income to equity holders / Market value of equity) × 100

= (₹ 321.12 lakhs / ₹ 1,557.50 lakhs) × 100 = 20.62%

Cost of debt (K_d) = I (1 - t) = 15 (1 - 0.3) = 10.50%

Components	Amount (₹ In lakhs)	Cost of Capital %	Weight	WACC (K_o) %
Equity	1,557.50	20.62	0.85	17.53
Debt	275.00	10.50	0.15	1.58
	1,832.50		1	19.11

The impact is that the Overall Cost of Capital or K_o has fallen by 0.89% (20% - 19.11%) due to the benefit of tax relief on debt interest payment.

(iii) Cost of Equity

The impact is that cost of equity has risen by 0.62% (20.62% - 20%) due to the presence of financial risk i.e. introduction of debt in capital structure.

Note: Cost of Capital and Cost of equity can also be calculated with the help of following formulas, though there will be no change in the final answers.

Cost of Capital (K_o) = K_{eu} [1 – (t x L)]

Where,

K_{eu} = Cost of equity in an unlevered company

t = Tax rate

$$L = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

$$\text{So, } K_o = 0.20 \left[1 - \left(0.3 \times \frac{₹\ 275 \text{ lakhs}}{₹\ 1{,}832.5 \text{ lakhs}}\right)\right] = 0.191 \text{ or } 19.10\% \text{ (approx.)}$$

$$\text{Cost of Equity } (K_e) = K_{eu} + (K_{eu} - K_d)\ \frac{\text{Debt}(1-t)}{\text{Equity}}$$

Where,

K_{eu} = Cost of equity in an unlevered company

K_d = Cost of debt

t = Tax rate

$$\text{So, } K_e = 0.20 + \left((0.20 - 0.15) \times \frac{₹\ 275 \text{ lakhs } (1 - 0.3)}{₹\ 1{,}557.5 \text{ lakhs}}\right) = 0.2062 \text{ or } 20.62\%$$

5. Statement showing Profitability of Alternative Schemes for Financing

(₹ in '00,000)

Particulars	Existing	Alternative Schemes		
		(i)	(ii)	(iii)
Equity Share capital (existing)	10	10	10	10
New issues	-	10	5	-
	10	**20**	**15**	**10**
7% debentures	10	10	10	10
6% debentures	-	-	5	10
	20	**30**	**30**	**30**

Debenture interest (7%)	0.7	0.7	0.7	0.7
Debenture interest (6%)	-	-	0.3	0.6
	0.7	**0.7**	**1.0**	**1.3**
Output (units in lakh)	1	1.5	1.5	1.5
Contribution per. unit (₹) (Selling price - Variable Cost)	**20**	**22**	**22**	**22**
Contribution (₹ lakh)	**20**	**33**	**33**	**33**
Less: Fixed cost	10	15	15	15
EBIT	**10**	**18**	**18**	**18**
Less: Interest (as calculated above)	0.7	0.7	1.0	1.3
EBT	**9.3**	**17.3**	**17**	**16.7**
Less: Tax (40%)	3.72	6.92	6.8	6.68
EAT	**5.58**	**10.38**	**10.20**	**10.02**
Operating Leverage (Contribution /EBIT)	**2.00**	**1.83**	**1.83**	**1.83**
Financial Leverage (EBIT/EBT)	**1.08**	**1.04**	**1.06**	**1.08**
Combined Leverage (Contribution/EBT)	**2.15**	**1.91**	**1.94**	**1.98**
EPS (EAT/No. of shares) (₹)	**5.58**	**5.19**	**6.80**	**10.02**
Risk	**-**	**Lowest**	**Lower than option (3)**	**Highest**
Return	**-**	**Lowest**	**Lower than option (3)**	**Highest**

From the above figures, we can see that the Operating Leverage is same in all alternatives though Financial Leverage differs. Alternative (iii) uses the maximum amount of debt and result into the highest degree of financial leverage, followed by alternative (ii). Accordingly, risk of the company will be maximum in these options. Corresponding to this scheme, however, maximum EPS (i.e., ₹ 10.02 per share) will be also in option (iii).

So, if Navya Ltd. is ready to take a high degree of risk, then alternative (iii) is strongly recommended. In case of opting for less risk, alternative (ii) is the next best option with a reduced EPS of ₹ 6.80 per share. In case of alternative (i), EPS is even lower than the existing option, hence not recommended.

6. Workings:

1. Calculation of Base for depreciation or Cost of New Machine

Particulars	(₹)
Purchase price of new machine	4,50,000
Less: Sale price of old machine	1,00,000
	3,50,000

2. Calculation of Profit before tax as per books

Particulars	Old machine (₹)	New machine (₹)	Difference (₹)
PBT as per books	3,24,750	3,87,250	62,500
Add: Depreciation as per books	24,000	41,500	17,500
Profit before tax and depreciation (PBTD)	3,48,750	4,28,750	80,000

Calculation of Incremental NPV

Year	PVF @ 10%	PBTD (₹)	Dep. @ 7.5% (₹)	PBT (₹)	Tax @ 30% (₹)	Cash Inflows (₹)	PV of Cash Inflows (₹)
	(1)	(2)	(3)	(4)	(5) = (4) x 0.30	(6) = (4) – (5) + (3)	(7) = (6) x (1)
1	0.909	80,000.00	26,250.00	53,750.00	16,125.00	63,875.00	58,062.38
2	0.826	80,000.00	24,281.25	55,718.75	16,715.63	63,284.38	52,272.89
3	0.751	80,000.00	22,460.16	57,539.84	17,261.95	62,738.05	47,116.27
4	0.683	80,000.00	20,775.64	59,224.36	17,767.31	62,232.69	42,504.93
5	0.621	80,000.00	19,217.47	60,782.53	18,234.76	61,765.24	38,356.21
6	0.564	80,000.00	17,776.16	62,223.84	18,667.15	61,332.85	34,591.73
7	0.513	80,000.00	16,442.95	63,557.05	19,067.12	60,932.88	31,258.57
8	0.467	80,000.00	15,209.73	64,790.27	19,437.08	60,562.92	28,282.88
9	0.424	80,000.00	14,069.00	65,931.00	19,779.30	60,220.70	25,533.58
10	0.386	80,000.00	13,013.82	66,986.18	20,095.85	59,904.15	23,123.00
							3,81,102.44
Add: PV of Salvage value of new machine (₹ 35,000 × 0.386)							13,510.00
Total PV of incremental cash inflows							3,94,612.44
Less: Cost of new machine							3,50,000.00
Incremental Net Present Value							44,612.44

Analysis: Since the Incremental NPV is positive, the old machine should be replaced.

7. (i) Bank loan: Since the compensating balance would not otherwise be maintained, the real annual cost of taking bank loan would be:

$$= \frac{15}{90} \times 100 = 16.67\ \%\ \text{p.a.}$$

(ii) Trade credit: Amount upto ₹ 1,50,000 can be raised within 2 months or 60 days. The real annual cost of trade credit would be:

$$= \frac{3}{97} \times \frac{360}{60} \times 100 = 18.56\%\ \text{p.a.}$$

(iii) Factoring:

Commission charges per year	= 2% × (₹ 2,00,000 × 12)	= ₹ 48,000
Total Savings per year	= (₹ 1,250 + ₹ 1,750) × 12	= ₹ 36,000
Net factoring cost per year	= ₹ 48,000 - ₹ 36,000	= ₹ 12,000

Annual Cost of Borrowing ₹ 1,50,000 receivables through factoring would be:

$$= \frac{12\% \times 1,50,000 + ₹\ 12,000}{₹\ 1,50,000} \times 100$$

$$= \frac{₹\ 18,000 + ₹\ 12,000}{₹\ 1,50,000} \times 100$$

= 20% p.a.

Advise: The company should select alternative of Bank Loan as it has the lowest annual cost i.e. 16.67% p.a.

8. Preparation of Statement of Working Capital Requirement for Trux Company Ltd.

	(₹)	(₹)
A. Current Assets		
(i) Inventories:		
Material (1 month) $\left(\frac{₹\ 6,75,000}{12\ \text{months}} \times 1\ \text{month}\right)$	56,250	
Finished goods (1 month) $\left(\frac{₹\ 21,60,000}{12\ \text{months}} \times 1\ \text{month}\right)$	1,80,000	2,36,250

(ii)	Receivables (Debtors)		
	For Domestic Sales $\left(\frac{₹15,17,586}{12\text{months}} \times 1\text{month}\right)$	1,26,466	
	For Export Sales $\left(\frac{₹\ 7,54,914}{12\text{months}} \times 3\text{months}\right)$	1,88,729	3,15,195
(iii)	Prepayment of Selling expenses $\left(\frac{₹1,12,500}{12\text{months}} \times 3\text{months}\right)$		28,125
(iii)	Cash in hand & at bank		1,75,000
	Total Current Assets		7,54,570
B.	**Current Liabilities:**		
(i)	Payables (Creditors) for materials (2 months) $\left(\frac{₹6,75,000}{12\text{months}} \times 2\text{months}\right)$		1,12,500
(ii)	Outstanding wages (0.5 months) $\left(\frac{₹5,40,000}{12\text{months}} \times 0.5\text{month}\right)$		22,500
(iii)	Outstanding manufacturing expenses $\left(\frac{₹7,65,000}{12\text{months}} \times 1\text{month}\right)$		63,750
(iv)	Outstanding administrative expenses $\left(\frac{₹1,80,000}{12\text{months}} \times 1\text{month}\right)$		15,000
(v)	Income tax payable		42,000
	Total Current Liabilities		2,55,750
	Net Working Capital (A – B)		4,98,820
Add:	10% contingency margin		49,882
	Total Working Capital required		5,48,702

Working Notes:

1. Calculation of Cost of Goods Sold and Cost of Sales

	Domestic (₹)	Export (₹)	Total (₹)
Domestic Sales	18,00,000	8,10,000	26,10,000
Less: Gross profit @ 20% on domestic sales and 11.11% on export sales (Working note-2)	3,60,000	90,000	4,50,000
Cost of Goods Sold	14,40,000	7,20,000	21,60,000
Add: Selling expenses (Working note-3)	77,586	34,914	1,12,500
Cash Cost of Sales	15,17,586	7,54,914	22,72,500

2. Calculation of gross profit on Export Sales

Let domestic selling price is ₹ 100. Gross profit is ₹ 20, and then cost per unit is ₹ 80

Export price is 10% less than the domestic price i.e. ₹ 100 – (1- 0.1) = ₹ 90

Now, gross profit will be = ₹ 90 - ₹ 80 = ₹ 10

So, Gross profit ratio at export price will be = $\frac{₹\ 10}{₹\ 90} \times 100 = 11.11\%$

3. Apportionment of Selling expenses between Domestic and Exports sales:

Apportionment on the basis of sales value:

Domestic Sales = $\frac{₹\ 1,12,500}{₹\ 26,10,000} \times ₹\ 18,00,000 = ₹\ 77,586$

Exports Sales = $\frac{₹\ 1,12,500}{₹\ 26,10,000} \times ₹\ 8,10,000 = ₹\ 34,914$

4. Assumptions

(i) It is assumed that administrative expenses is related to production activities.

(ii) Value of opening and closing stocks are equal.

9. (i) Statement of Cash Flow for the year ending 31st March, 2021

	(₹)
Cash flow from Operating Activities	
Surplus during the year (₹ 3,00,000 – ₹ 2,10,000)	90,000

Adjustments:	
Add: Transfer to General Reserve	25,000
Provision for Tax	96,000
Proposed Dividend	1,44,000
Profit before Tax	3,55,000
Depreciation:	
Land and Building (₹7,00,000 – ₹6,50,000)	50,000
Plant and Machinery	1,20,000
Loss on sale of Plant and Machinery	9,000
Goodwill written off (₹1,00,000 – ₹80,000)	20,000
Interest on 11% Debentures (11% of ₹3,00,000)	33,000
Less: Profit on sale of Investments	(15,000)
Operating profit before working capital changes	5,72,000
Decrease in Prepaid expenses	4,000
Decrease in Inventories	15,000
Increase in Trade receivables	(1,27,000)
Increase in Trade payables	30,000
Cash generated from operations	4,94,000
Less: Income tax paid	(71,000)
Net Cash from Operating activities (A)	4,23,000
Cash flow from Investing Activities	
Sale of investment {(₹2,40,000 – ₹2,20,000) + ₹15,000}	35,000
Sale of Plant and Machinery	36,000
Purchase of Plant and Machinery	(2,25,000)
Net cash from Investing activities (B)	(1,54,000)
Cash Flow from Financing Activities	
Issue of 8% Preference shares	1,00,000
Premium received in issue of shares	25,000
Redemption of 11% Debentures (including premium)	(2,20,000)
Dividend paid	(1,36,000)
Interest paid to 11% Debenture holders	(33,000)
Net cash from Financing activities (C)	(2,64,000)

Net Increase/(Decrease) in cash and cash equivalents (A+B+C)	5,000
Cash and cash equivalent at the beginning of the year	88,000
Cash and cash equivalent at the end of the year	93,000

Working Notes:

(1) Provision for the Tax Account

	(₹)		(₹)
To Bank (paid)	71,000	By Balance b/d	80,000
To Balance c/d	1,05,000	By Statement of P&L	96,000
	1,76,000		1,76,000

(2) Investment Account

	(₹)		(₹)
To Balance b/d	2,40,000	By Bank A/c	35,000
To Statement of P&L (Profit on sale)	15,000	By Balance c/d	2,20,000
	2,55,000		2,55,000

(3) Plant and Machinery Account

	(₹)		(₹)
To Balance b/d	6,00,000	By Bank (sale)	36,000
To Bank a/c (Purchase)	2,25,000	By Statement of P&L (Loss on sale)	9,000
		By Depreciation	1,20,000
		By Balance c/d	6,60,000
	8,25,000		8,25,000

Note: Since the date of redemption of debentures is not mentioned in the question, therefore, it is assumed that the debentures are redeemed at the beginning of the year.

(ii) Schedule of Changes in Working Capital

Particulars	31st March		Change in Working Capital	
	2020 (₹)	2021 (₹)	Increase (₹)	Decrease (₹)
Current Assets				
Inventories	4,00,000	3,85,000	--	15,000

Trade receivables	2,88,000	4,15,000	1,27,000	--
Prepaid Expenses	15,000	11,000	–	4,000
Cash and Bank	88,000	93,000	5,000	--
Total (A)	7,91,000	9,04,000		
Current Liabilities				
Trade payables	1,85,000	2,15,000	--	30,000
Total (B)	1,85,000	2,15,000		
Working Capital (A – B)	6,06,000	6,89,000		
Increase in Working Capital	83,000	--	--	83,000
	6,89,000	6,89,000	1,32,000	1,32,000

10. (a) Points that demonstrates the Importance of good financial management:

- **Taking care** not to over-invest in fixed assets
- **Balancing** cash-outflow with cash-inflows
- **Ensuring** that there is a sufficient level of short-term working capital
- **Setting** sales revenue targets that will deliver growth
- **Increasing** gross profit by setting the correct pricing for products or services
- **Controlling** the level of general and administrative expenses by finding more cost-efficient ways of running the day-to-day business operations, and
- **Tax planning** that will minimize the taxes a business has to pay.

(b) Some common methods of venture capital financing are as follows:

(i) Equity financing: The venture capital undertakings generally require funds for a longer period but may not be able to provide returns to the investors during the initial stages. Therefore, the venture capital finance is generally provided by way of equity share capital. The equity contribution of venture capital firm does not exceed 49% of the total equity capital of venture capital undertakings so that the effective control and ownership remains with the entrepreneur.

(ii) Conditional loan: A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans. In India venture capital financiers charge royalty ranging between 2 and 15 per cent; actual rate depends on other factors of the venture such as gestation period, cash flow patterns, risk and other factors of the enterprise. Some Venture capital financiers give a choice to the enterprise of paying a high rate of interest (which could be well above 20 per cent) instead of royalty on sales once it becomes commercially sound.

(iii) Income note: It is a hybrid security which combines the features of both conventional loan and conditional loan. The entrepreneur has to pay both interest and royalty on sales but at substantially low rates. IDBI's VCF provides funding equal to 80 – 87.50% of the projects cost for commercial application of indigenous technology.

(iv) Participating debenture: Such security carries charges in three phases — in the start-up phase no interest is charged, next stage a low rate of interest is charged up to a particular level of operation, after that, a high rate of interest is required to be paid.