PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART-I COST ACCOUNTING

QUESTIONS

Material

1. A company uses four raw materials A, B, C and D for a particular product for which the following data apply :–

Raw Material	Usage per unit of product (Kg.)	Re-order Quantity (Kg.)	Price per Kg. (₹)	Delivery period (in weeks)			Re-order level (Kg.)	Minimum level (Kg.)
				Minimum	Average	Maximum		
A	12	12,000	12	2	3	4	60,000	?
B	8	8,000	22	5	6	7	70,000	?
C	6	10,000	18	3	5	7	?	25,500
D	5	9,000	20	1	2	3	?	?

Weekly production varies from 550 to 1,250 units, averaging 900 units of the said product. What would be the following quantities:–

(i) Minimum Stock of A?

(ii) Maximum Stock of B?

(iii) Re-order level of C?

(iv) Average stock level of A?

(v) Re-order level of D?

(vi) Minimum Stock level of D?

Labour

2. GZ Ld. pays the following to a skilled worker engaged in production works. The following are the employee benefits paid to the employee:

(a)	Basic salary per day	₹1,000
(b)	Dearness allowance (DA)	20% of basic salary
(c)	House rent allowance	16% of basic salary
(d)	Transport allowance	₹50 per day of actual work
(e)	Overtime	Twice the hourly rate (considers basic and DA), only if works more than 9 hours a day otherwise no overtime allowance. If works for more than 9 hours

		a day then overtime is considered after 8th hours.
(f)	Work of holiday and Sunday	Double of per day basic rate provided works atleast 4 hours. The holiday and Sunday basic is eligible for all allowances and statutory deductions.
(h)	Earned leave & Casual leave	These are paid leave.
(h)	Employer's contribution to Provident fund	12% of basic and DA
(i)	Employer's contribution to Pension fund	7% of basic and DA

The company normally works 8-hour a day and 26-day in a month. The company provides 30 minutes lunch break in between.

During the month of August 2020, Mr.Z works for 23 days including 15th August and a Sunday and applied for 3 days of casual leave. On 15th August and Sunday he worked for 5 and 6 hours respectively without lunch break.

On 5th and 13th August he worked for 10 and 9 hours respectively.

During the month Mr. Z worked for 100 hours on Job no.HT200.

You are required to CALCULATE:

(i) Earnings per day

(ii) Effective wages rate per hour of Mr.Z.

(iii) Wages to be charged to Job no.HT200.

Overheads

3. You are given the following information of the three machines of a manufacturing department of X Ltd.:

	Preliminary estimates of expenses (per annum)			
	Total (₹)	Machines		
		A (₹)	B (₹)	C (₹)
Depreciation	2,00,000	75,000	75,000	50,000
Spare parts	1,00,000	40,000	40,000	20,000
Power	4,00,000			
Consumable stores	80,000	30,000	25,000	25,000
Insurance of machinery	80,000			
Indirect labour	2,00,000			
Building maintenance expenses	2,00,000			

Annual interest on capital outlay	1,00,000	40,000	40,000	20,000
Monthly charge for rent and rates	20,000			
Salary of foreman (per month)	42,000			
Salary of Attendant (per month)	12,000			

(The foreman and the attendant control all the three machines and spend equal time on them.)

The following additional information is also available:

	Machines		
	A	B	C
Estimated Direct Labour Hours	1,00,000	1,50,000	1,50,000
Ratio of K.W. Rating	3	2	3
Floor space (sq. ft.)	40,000	40,000	20,000

There are 12 holidays besides Sundays in the year, of which two were on Saturdays. The manufacturing department works 8 hours in a day but Saturdays are half days. All machines work at 90% capacity throughout the year and 2% is reasonable for breakdown.

You are required to :

CALCULATE predetermined machine hour rates for the above machines after taking into consideration the following factors:

- An increase of 15% in the price of spare parts.
- An increase of 25% in the consumption of spare parts for machine 'B' & 'C' only.
- 20% general increase in wages rates.

Non-Integrated Accounts

4. A manufacturing company disclosed a net loss of ₹6,94,000 as per their cost accounts for the year ended March 31,2020. The financial accounts however disclosed a net loss of ₹10,20,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

	(₹)
(i) Factory Overheads under-absorbed	80,000
(ii) Administration Overheads over-absorbed	1,20,000
(iii) Depreciation charged in Financial Accounts	6,50,000
(iv) Depreciation charged in Cost Accounts	5,50,000
(v) Interest on investments not included in Cost Accounts	1,92,000

(vi) Income-tax provided	1,08,000
(vii) Interest on loan funds in Financial Accounts	4,90,000
(viii) Transfer fees (credit in financial books)	48,000
(ix) Stores adjustment (credit in financial books)	28,000
(x) Dividend received	64,000

PREPARE a memorandum Reconciliation Account.

Batch Costing

5. A Ltd. manufactures mother boards used in smart phones. A smart phone requires one mother board. As per the study conducted by the Indian Cellular Association, there will be a demand of 180 million smart phones in the coming year. A Ltd. is expected to have a market share of 5.5% of the total market demand of the mother boards in the coming year. It is estimated that it costs ₹6.25 as inventory holding cost per board per month and that the set-up cost per run of board manufacture is ₹33,500.

   (i) COMPUTE the optimum run size for board manufacturing?

   (ii) Assuming that the company has a policy of manufacturing 80,000 boards per run, CALCULATE how much extra costs the company would be incurring as compared to the optimum run suggested in (i) above?

Job Costing

6. AP Ltd. received a job order for supply and fitting of plumbing materials. Following are the details related with the job work:

   Direct Materials

   AP Ltd. uses a weighted average method for the pricing of materials issues.

   Opening stock of materials as on 12th August 2020:

   - 15mm GI Pipe, 12 units of (15 feet size) @ ₹600 each
   - 20mm GI Pipe, 10 units of (15 feet size) @ ₹ 660 each
   - Other fitting materials, 60 units @ ₹ 26 each
   - Stainless Steel Faucet, 6 units @ ₹ 204 each
   - Valve, 8 units @ ₹ 404 each

   Purchases:

   On 16th August 2020:

   - 20mm GI Pipe, 30 units of (15 feet size) @ ₹ 610 each
   - 10 units of Valve @ ₹ 402 each

On 18th August 2020:

- Other fitting materials, 150 units @ ₹ 28 each
- Stainless Steel Faucet, 15 units @ ₹ 209 each

On 27th August 2020:

- 15mm GI Pipe, 35 units of (15 feet size) @ ₹ 628 each
- 20mm GI Pipe, 20 units of (15 feet size) @ ₹ 660 each
- Valve, 14 units @ ₹ 424 each

Issues for the hostel job:

On 12th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- Other fitting materials, 18 units

On 17th August 2020:

- 15mm GI Pipe, 8 units of (15 feet size)
- Other fitting materials, 30 units

On 28th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- 15mm GI Pipe, 10 units of (15 feet size)
- Other fitting materials, 34 units
- Valve, 6 units

On 30th August 2020:

- Other fitting materials, 60 units
- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ ₹100 per hour (includes 12 hours overtime)

Helper: 192 hours @ ₹70 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ ₹26 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

(a) CALCULATE the total cost of the job.

(b) CALCULATE the price to be charged from the customer.

Process Costing

7. M Ltd. produces a product-X, which passes through three processes, I, II and III. In Process-III a by-product arises, which after further processing at a cost of ₹85 per unit, product Z is produced. The information related for the month of August 2020 is as follows:

	Process-I	Process-II	Process-III
Normal loss	5%	10%	5%
Materials introduced (7,000 units)	1,40,000	-	-
Other materials added	62,000	1,36,000	84,200
Direct wages	42,000	54,000	48,000
Direct expenses	14,000	16,000	14,000

Production overhead for the month is ₹ 2,88,000, which is absorbed as a percentage of direct wages.

The scrapes are sold at ₹10 per unit

Product-Z can be sold at ₹135 per unit with a selling cost of ₹15 per unit

No. of units produced:

Process-I- 6,600; Process-II- 5,200, Process-III- 4,800 and Product-Z- 600

There is not stock at the beginning and end of the month.

You are required to PREPARE accounts for:

(i) Process-I, II and III

(ii) By-product process.

Joint Products & By Products

8. ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split off without further processing or any other additional costs. Product Z, however, is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2019-20, the selling prices of the items and the total amounts sold were:

X – 186 tons sold for ₹3,000 per ton

Y – 527 tons sold for ₹2,250 per ton

Z – 736 tons sold for ₹1,500 per ton

The total joint manufacturing costs for the year were ₹12,50,000. An additional ₹6,20,000 was spent to finish product Z.

There were no opening inventories of X, Y or Z at the end of the year. The following inventories of complete units were on hand:

X 180 tons

Y 60 Tons

Z 25 tons

There was no opening or closing work-in-progress.

Required:

COMPUTE the cost of inventories of X, Y and Z and cost of goods sold for year ended March 31, 2020, using Net realizable value (NRV) method of joint cost allocation.

Operating Costing

9. A transport company has 20 vehicles, the capacities are as follows:

No. of Vehicles	Capacity per vehicle
5	9 MT
6	12 MT
7	15 MT
2	20 MT

The company provides the goods transport service between stations 'A' to station 'B'. Distance between these stations is 100 kilometers. Each vehicle makes one round trip per day on an average. Vehicles are loaded with an average of 90 per cent of capacity at the time of departure from station 'A' to station 'B' and at the time of return back loaded with 70 per cent of capacity. 10 per cent of vehicles are laid up for repairs every day. The following information is related to the month of August, 2020:

Salary of Transport Manager	₹ 60,000
Salary of 30 drivers	₹ 20,000 each driver
Wages of 25 Helpers	₹ 12,000 each helper
Loading and unloading charges	₹ 850 each trip
Consumable stores (depends on running of vehicles)	₹ 1,35,000
Insurance (Annual)	₹ 8,40,000
Road Licence (Annual)	₹ 6,00,000
Cost of Diesel per litre	₹ 78
Kilometres run per litre each vehicle	5 Km.
Lubricant, Oil etc.	₹ 1,15,000
Cost of replacement of Tyres, Tubes, other parts etc. (on running basis)	₹ 4,25,000
Garage rent (Annual)	₹ 9,00,000
Routine mechanical services	₹ 3,00,000
Electricity charges (for office, garage and washing station)	₹ 55,000
Depreciation of vehicles (on time basis)	₹ 6,00,000

There is a workshop attached to transport department which repairs these vehicles and other vehicles also. 40 per cent of transport manager's salary is debited to the workshop. The transport department has been apportioned ₹88,000 by the workshop during the month. During the month operation was for 25 days.

You are required:

(i) CALCULATE per ton-km operating cost.

(ii) DETERMINE the freight to be charged per ton-km, if the company earned a profit of 25 per cent on freight.

Standard Costing

10. Following are the standard cost for a product-X:

	(₹)
Direct materials 10 kg @ ₹ 90 per kg	900
Direct labour 8 hours @ ₹100 per hour	800
Variable Overhead 8 hours @ ₹15 per hour	120
Fixed Overhead	400
	2,220

Budgeted output for the year was 2,000 units. Actual output is 1,800 units.

Actual cost for year is as follows:

	(₹)
Direct Materials 17,800 Kg @ ₹ 92 per Kg.	16,37,600
Direct Labour 14,000 hours @ ₹ 104 per hour	14,56,000
Variable Overhead incurred	2,17,500
Fixed Overhead incurred	7,68,000

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

11. J Ltd. manufactures a Product-Y. Analysis of income statement indicated a profit of ₹ 250 lakhs on a sales volume of 5,00,000 units. Fixed costs are ₹1,000 lakhs which appears to be high. Existing selling price is ₹680 per unit. The company is considering revising the profit target to ₹ 700 lakhs. You are required to COMPUTE –

    (i) Break- even point at existing levels in units and in rupees.

    (ii) The number of units required to be sold to earn the target profit.

    (iii) Profit with 10% increase in selling price and drop in sales volume by 10%.

    (iv) Volume to be achieved to earn target profit at the revised selling price as calculated in (ii) above, if a reduction of 10% in the variable costs and ₹ 170 lakhs in the fixed cost is envisaged.

Budget and Budgetary Control

12. The information of Z Ltd. for the year ended 31st March 2020 is as below:

	Amount (₹)
Direct materials	17,50,000
Direct wages	12,50,000

Variable factory overhead	9,50,000
Fixed factory overhead	12,00,000
Other variable costs	6,00,000
Other fixed costs	4,00,000
Profit	8,50,000
Sales	70,00,000

During the year, the company manufactured two products, X and Y, and the output and cost were:

	X	Y
Output (units)	8,000	4,000
Selling price per unit (₹)	600	550
Direct material per unit (₹)	140	157.50
Direct wages per unit (₹)	90	132.50

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as:

Product X – ₹40 per unit and Product Y- ₹70 per unit.

For the FY 2020-21, due to a pandemic, it is expected that demand for product X and Y will fall by 20% & 10% respectively. It is also expected that direct wages cost will raise by 20% and other fixed costs by 10%. Products will be required to be sold at a discount of 20%.

You are required to:

(i) PREPARE product- wise profitability statement on marginal costing method for the FY 2019-20 and

(ii) PREPARE a budget for the FY 2020-21.

Miscellaneous

13. (a) DISCUSS short notes on (i) Discretionary Cost Centre and (ii) Investment Centre

(b) DESCRIBE the three advantages of Cost-plus contract.

(c) STATE the advantages of Zero-based budgeting.

(d) DESCRIBE Operation costing with two examples of industries where operation costing is applied.

SUGGESTED HINTS/ANSWERS

1. (i) Minimum stock of A

Re-order level – (Average consumption × Average time required to obtain delivery)

= 60,000 kg. – (900units × 12 kg. × 3 weeks) = 27,600 kg.

(ii) Maximum stock of B

Re-order level + Re-order quantity– (Min. Consumption × Min. Re-order period)

= 70,000 kg.+ 8,000 kg– (550units ×8 kg.× 5 weeks).

=78,000–22,000 = 56,000 kg.

(iii) Re-order level of C

Maximum re-order period × Maximum Usage

= 7 weeks × (1,250units × 6 kg.) = 52,500 kg.

OR

= Minimum stock of C+(Average consumption × Average delivery time)

= 25,500 kg.+ [(900 units ×6 kg.)×5 weeks] =52,500 kg.

(iv) Average stock level of A

$$= \frac{\text{Minimum stock + Maximum stock}}{2}$$ (Refer to Working Note)

$$= \frac{27,600 + 58,800}{2} = 43,200 \text{ kg.}$$

Working note

Maximum stock of A = ROL + ROQ – (Minimum consumption × Minimum re-order period)

= 60,000 kg. + 12,000 kg. – [(550units × 12 kg.) × 2 weeks] = 58,800 kg.

(v) Re-order level of D

Maximum re-order period × Maximum Usage

= 3 weeks × (1,250 units × 5 kg.) = 18,750 kg

(vi) Minimum stock of D

Re-order level – (Average consumption × Average time required to obtain delivery)

= 18,750 kg. – (900units × 5 kg. × 2 weeks) = 9,750 kg.

2. Workings:

1. Normal working hours in a month = (Daily working hours – lunch break) × no. of days

   = (8 hours – 0.5 hours) × 26 days = 195 hours

2. Hours worked by Mr.Z = No. of normal days worked + Overtime + holiday/ Sunday worked

   = (21 days × 7.5 hours) + (9.5 hours + 8.5 hours) + (5 hours + 6 hours)

   = 157.5 hours + 18 hours + 11 hours = 186.50 hours.

(i) Calculation of earnings per day

Particulars	Amount (₹)
Basic salary (₹1,000 × 26 days)	26,000
Dearness allowance (20% of basic salary)	5,200
	31,200
House rent allowance (16% of basic salary)	4,160
Employer's contribution to Provident fund (12% × ₹31,200)	3,744
Employer's contribution to Pension fund (7% × ₹31,200)	2,184
	41,288
No. of working days in a month (days)	26
Rate per day	1,588
Transport allowance per day	50
Earnings per day	**1,638**

(ii) Calculation of effective wage rate per hour of Mr. Z:

Particulars	Amount (₹)
Basic salary (₹1,000 × 26 days)	26,000
Additional basic salary for Sunday & holiday (₹1,000 × 2 days)	2,000
Dearness allowance (20% of basic salary)	5,600
	33,600
House rent allowance (16% of basic salary)	4,480
Transport allowance (₹50 × 23 days)	1,150
Overtime allowance (₹160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × ₹33,600)	4,032

Employer's contribution to Pension fund (7% × ₹33,600)	2,352
Total monthly wages	46,254
Hours worked by Mr. Z (hours)	186.5
Effective wage rate per hour	**248**

*(Daily Basic + DA) ÷ 7.5 hours

= (1,000+200) ÷ 7.5 = ₹ 160 per hour

(iii) Calculation of wages to be charged to Job no. HT200

= ₹248 × 100 hours = ₹ 24,800

3. (a) Computation of Machine Hour Rate

		Basis of apportionment	Total (₹)	Machines		
				A (₹)	B (₹)	C (₹)
(A)	**Standing Charges**					
	Insurance	Depreciation Basis (3:3:2)	80,000	30,000	30,000	20,000
	Indirect Labour	Direct Labour (2:3:3)	2,40,000	60,000	90,000	90,000
	Building maintenance expenses	Floor Space (2:2:1)	2,00,000	80,000	80,000	40,000
	Rent and Rates	Floor Space (2:2:1)	2,40,000	96,000	96,000	48,000
	Salary of foreman	Equal	5,04,000	1,68,000	1,68,000	1,68,000
	Salary of attendant	Equal	1,44,000	48,000	48,000	48,000
	Total standing charges		14,08,000	4,82,000	5,12,000	4,14,000
	Hourly rate for standing charges			247.43	262.83	212.53
(B)	**Machine Expenses:**					
	Depreciation	Direct	2,00,000	75,000	75,000	50,000
	Spare parts	Final estimates	1,32,250	46,000	57,500	28,750
	Power	K.W. rating (3:2:3)	4,00,000	1,50,000	1,00,000	1,50,000
	Consumable	Direct	80,000	30,000	25,000	25,000

Stores				
Total Machine expenses	8,12,250	3,01,000	2,57,500	2,53,750
Hourly Rate for Machine expenses		154.52	132.19	130.26
Total (A + B)	22,20,250	7,83,000	7,69,500	6,67,750
Machine Hour rate		**401.95**	**395.02**	**342.79**

Working Notes:

(i) Calculation of effective working hours:

No. of full off-days = No. of Sunday + No. of holidays

= 52 + 12 = 64 days

No. of half working days = 52 days – 2 holidays = 50 days

No. of full working days = 365 days – 64 days – 50 days = 251 days

Total working Hours = {(251 days × 8 hours) + (50 days × 4 hours)}

= 2,008 hours + 200 = 2,208 hours.

Total effective hours = Total working hours × 90% - 2% for break-down

= 2,208 hours × 90% - 2% (2,208 hours × 90%)

= 1,987.2 hours – 39.74 hours

= 1947.46 or Rounded up to 1948 hours.

(ii) Amount of spare parts is calculated as under:

	A (₹)	B (₹)	C (₹)
Preliminary estimates	40,000	40,000	20,000
Add: Increase in price @ 15%	6,000	6,000	3,000
	46,000	46,000	23,000
Add: Increase in consumption @ 25%	–	11,500	5,750
Estimated cost	46,000	57,500	28,750

(iii) Amount of Indirect Labour is calculated as under:

	(₹)
Preliminary estimates	2,00,000
Add: Increase in wages @ 20%	40,000
	2,40,000

(iv) Interest on capital outlay is a finance cost, therefore it has been excluded from the cost accounts.

4. Memorandum Reconciliation Accounts

Dr. Cr.

	(₹)		(₹)
To Net Loss as per Costing books	6,94,000	By Administration overheads over recovered in cost accounts	1,20,000
To Factory overheads under absorbed in Cost Accounts	80,000	By Interest on investment not included in Cost Accounts	1,92,000
To Depreciation under charged in Cost Accounts	1,00,000	By Transfer fees in Financial books	48,000
To Income-Tax not provided in Cost Accounts	1,08,000	By Stores adjustment (Credit in financial books)	28,000
To Interest on Loan Funds in Financial Accounts	4,90,000	By Dividend received in financial books	64,000
		By Net loss as per Financial books	10,20,000
	14,72,000		14,72,000

5. (i) Computation of optimum run size

Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2 \times D \times S}{C}}$

Where, D = Annual demand i.e. 5.5% of 18,00,00,000 = 99,00,000 units

S = Set-up cost per run = ₹33,500

C = Inventory holding cost per unit per annum

= ₹6.25 × 12 months = ₹75

EBQ = $\sqrt{\frac{2 \times 99,00,000 \text{ units} \times ₹33,500}{₹\,75}}$ = 94,042.5 units or 94,043 units

(ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set-ups	Set-up Cost (₹)	Inventory holding cost (₹)	Total Cost (₹)
A	80,000 units	124 $\left(\frac{99,00,000}{80,000}\right)$	41,54,000 (124 × ₹33,500)	30,00,000 $\left(\frac{80,000\times₹75}{2}\right)$	71,54,000
B	94,043 units	106 $\left(\frac{99,00,000}{94,043}\right)$	35,51,000 (106 × ₹33,500)	35,26,612.5 $\left(\frac{94,043\times₹75}{2}\right)$	70,77,612.50
	Extra Cost (A – B)				76,387.50

6. (a) Calculation of Total Cost for the Job:

Particulars	Amount (₹)	Amount (₹)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	
- Stainless steel faucet 15 units × $\left(\frac{6\times₹204+15\times₹209}{21\text{units}}\right)$	3,113.57	
- Valve 6 units × $\left(\frac{8\times₹404+10\times₹402+14\times₹424}{32\text{units}}\right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours × ₹100) + (12 hours × ₹50)]	18,600.00	
- Helper [(192 hours × ₹70) + (24 hours × ₹35)]	14,280.00	32,880.00
- Overheads[₹26 × (180 + 192) hours]		9,672.00
Total Cost		**65,643.95**

(b) Price to be charged for the job work:

	Amount (₹)
Total Cost incurred on the job	65,643.95

Add: 25% Profit on Job Price $\left(\frac{65,643.95}{75\%}\times 25\%\right)$	21,881.32
	87,525.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (₹)
17-08-2020	8 units × ₹ 600	4,800.00
28-08-2020	10 units × $\left(\frac{4\times ₹600+35\times ₹628}{39\,\text{units}}\right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (₹)
12-08-2020	2 units × ₹ 660	1,320.00
28-08-2020	2 units × $\left(\frac{8\times ₹660+30\times ₹610+20\times ₹660}{58\,\text{units}}\right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (₹)
12-08-2020	18 units × ₹ 26	468.00
17-08-2020	30 units × ₹ 26	780.00
28-08-2020	34 units × $\left(\frac{12\times ₹26+150\times ₹28}{162\,\text{units}}\right)$	946.96
30-08-2020	60 units × $\left(\frac{12\times ₹26+150\times ₹28}{162\,\text{units}}\right)$	1,671.11
		3,866.07

7. (i) Process-I A/c

Particulars	Units	Amt.(₹)	Particulars	Units	Amt.(₹)
To Materials	7,000	1,40,000	By Normal loss (5% of 7,000)	350	3,500

To Other materials	-	62,000	By Process-II*	6,600	3,35,955
To Direct wages	-	42,000	By Abnormal loss*	50	2,545
To Direct expenses	-	14,000			
To Production OH (200% of ₹42,000)	-	84,000			
	7,000	3,42,000		7,000	3,42,000

* $\frac{₹(3,42,000-3,500)}{(7,000-350)\text{units}}$ = ₹50.9022

Process-II A/c

Particulars	Units	Amt.(₹)	Particulars	Units	Amt.(₹)
To Process-I A/c	6,600	3,35,955	By Normal loss (10% of 6,600)	660	6,600
To Other materials	-	1,36,000	By Process-III**	5,200	5,63,206
To Direct wages	-	54,000	By Abnormal loss**	740	80,149
To Direct expenses	-	16,000			
To Production OH (200% of ₹54,000)	-	1,08,000			
	6,600	6,49,955		6,600	6,49,955

** $\frac{₹(6,49,955-6,600)}{(6,600-660)\text{units}}$ = ₹108.3089

Process-III A/c

Particulars	Units	Amt.(₹)	Particulars	Units	Amt.(₹)
To Process-I A/c	5,200	5,63,206	By Normal loss (5% of 5,200)	260	2,600
To Other materials	-	84,200	By Product-X***	4,800	8,64,670

To Direct wages	-	48,000			
To Direct expenses	-	14,000	By Product-Z# (₹35×600)	600	21,000
To Production OH (200% of ₹48,000)	-	96,000			
To Abnormal gain***	460	82,864			
	5,660	8,88,270		5,660	8,88,270

*** $\frac{₹(8,05,406-2,600-21,000)}{(5,200-260-600)\text{ units}}$ = ₹180.1396

Realisable value = ₹135 – (85+15) = ₹35

(ii) By-Product Process A/c

Particulars	Units	Amt.(₹)	Particulars	Units	Amt.(₹)
To Process-III A/c	600	21,000	By Product-Z	600	81,000
To Processing cost	-	51,000			
To Selling expenses	-	9,000			
	600	81,000		600	81,000

8. (i) (a) Statement of Joint Cost allocation of inventories of X, Y and Z

(By using Net Realisable Value Method)

	Products			Total
	X	Y	Z	
	(₹)	(₹)	(₹)	(₹)
Final sales value of total production (Working Note 1)	10,98,000 (366 × ₹3,000)	13,20,750 (587 × ₹2,250)	11,41,500 (761 × ₹1,500)	35,60,250
Less: Additional cost	--	--	(6,20,000)	(6,20,000)
Net realisable value (at split-off point)	10,98,000	13,20,750	5,21,500	29,40,250
Joint cost allocated (Working Note 2)	4,66,797	5,61,496	2,21,707	12,50,000

Cost of goods sold as on March 31, 2020
(By using Net Realisable Value Method)

	Products			Total
	X	Y	Z	
	(₹)	(₹)	(₹)	(₹)
Allocated joint cost	4,66,797	5,61,496	2,21,707	12,50,000
Additional costs	--	--	6,20,000	6,20,000
Cost of goods available for sale (CGAS)	4,66,797	5,61,496	8,41,707	18,70,000
Less: Cost of ending inventory (Working Note 1)	2,29,571 (CGAS×49.18%)	57,385 (CGAS × 10.22%)	27,692 (CGAS × 3.29%)	3,14,648
Cost of goods sold	2,37,226	5,04,111	8,14,015	15,55,352

Working Notes

1. Total production of three products for the year 2019-2020

Products	Quantity sold in tones	Quantity of ending inventory in tons	Total production	Ending inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)}	(5) = (3)/ (4)
X	186	180	366	49.18
Y	527	60	587	10.22
Z	736	25	761	3.29

2. Joint cost apportioned to each product:

$$\frac{\text{Total Joint cost}}{\text{Total Net Realisable Value}} \times \text{Net Realisable Value of each product}$$

$$\text{Total cost of Product X} = \frac{₹\ 12,50,000}{₹\ 29,40,250} \times ₹10,98,000 = ₹4,66,797$$

$$\text{Total cost of Product Y} = \frac{₹\ 12,50,000}{₹\ 29,40,250} \times ₹13,20,750 = ₹5,61,496$$

$$\text{Total cost of Product Z} = \frac{₹\ 12,50,000}{₹\ 29,40,250} \times ₹5,21,500 = ₹2,21,707$$

9. (i) Operating Cost Sheet for the month of August, 2020

	Particulars	Amount (₹)
A.	**Fixed Charges:**	
	Manager's salary (₹60,000 × 60%)	36,000
	Drivers' Salary (₹20,000 × 30 drivers)	6,00,000
	Helpers' wages (₹12,000 × 25 helpers)	3,00,000
	Insurance (₹8,40,000 ÷ 12 months)	70,000
	Road licence (₹6,00,000 ÷ 12 months)	50,000
	Garage rent (₹9,00,000 ÷ 12 months)	75,000
	Routine mechanical services	3,00,000
	Electricity charges (for office, garage and washing station)	55,000
	Depreciation of vehicles	6,00,000
	Apportioned workshop expenses	88,000
	Total (A)	21,74,000
B.	**Variable Charges:**	
	Loading and unloading charges (Working Note 1)	7,65,000
	Consumable Stores	1,35,000
	Cost of diesel (Working Note 2)	14,04,000
	Lubricant, Oil etc.	1,15,000
	Replacement of Tyres, Tubes & other parts	4,25,000
	Total (B)	28,44,000
C.	**Total Cost (A + B)**	**50,18,000**
D.	Total Ton-Kms. (Working Note 3)	9,43,200
E.	**Cost per ton-km. (C ÷ D)**	**5.32**

(ii) Calculation of Chargeable Freight

Cost per ton-km.	₹ 5.32
Add: Profit @ 25% on freight or 33⅓% on cost	₹ 1.77
Chargeable freight per ton-km.	**₹ 7.09**

Working Notes:

1. Wages paid to loading and unloading labours

Numbers of vehicles available per day × No. of days × trips × wages per trip

(20 vehicles × 90%) × 25 days × 2 trips × ₹850

18 × 25 × 2 × 850 = ₹7,65,000

2. Cost of Diesel:

Distance covered by each vehicle during August, 2020

= 100 k.m. × 2 × 25 days × 90% = 4,500 km.

$$\text{Consumption of diesel} = \frac{4{,}500\,\text{k.m.} \times 20\,\text{vehicles}}{5\,\text{k.m.}} = 18{,}000\ \text{litres.}$$

Cost of diesel = 18,000 litres × ₹ 78 = ₹14,04,000.

3. Calculation of total ton-km:

Total Ton-Km. = Total Capacity × Distance covered by each vehicle × Average Capacity Utilisation ratio.

$$= \left[(5 \times 9\,\text{MT}) + (6 \times 12\,\text{MT}) + (7 \times 15\,\text{MT}) + (2 \times 20\,\text{MT})\right] \times 4{,}500\,\text{k.m.} \times \frac{(90\% + 70\%)}{2}$$

$$= (45 + 72 + 105 + 40) \times 4{,}500\ \text{k.m.} \times 80\%$$

= 262 × 4,500 × 80%.

= 9,43,200 ton-km.

10. (i) Material Usage Variance = Std. Price (Std. Quantity – Actual Quantity)

= ₹ 90 (18,000 kg. – 17,800 kg.)

= ₹ 18,000 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price – Actual Price)

= 17,800 kg. (₹ 90 – ₹ 92) = ₹ 35,600 (Adverse)

(iii) Material Cost Variance = Std. Material Cost – Actual Material Cost

= (SQ × SP) – (AQ × AP)

= (18,000 kg. × ₹ 90) – (17,800 kg. × ₹ 92)

= ₹ 16,20,000 – ₹ 16,37,600

= ₹17,600 (Adverse)

(iv) Labour Efficiency Variance = Std. Rate (Std. Hours – Actual Hours)

= ₹ 100 (1,800 units × 8 – 14,000 hrs.)

= ₹ 100 (14,400 hrs. – 14,000 hrs.)

= ₹ 40,000 (Favourable)

(v) Labour Rate Variance = Actual Hours (Std. Rate – Actual Rate)

= 14,000 hrs. (₹ 100 – ₹104)

= ₹ 56,000 (Adverse)

(vi) Labour Cost Variance = Std. Labour Cost – Actual Labour Cost

= (SH × SR) – (AH × AR)

= (14,400 hrs. × ₹ 100) – (14,000 hrs. × ₹ 104)

= ₹ 14,40,000 – ₹ 14,56,000

= ₹16,000 (Adverse)

(vii) Variable Cost Variance = Std. Variable Cost – Actual Variable Cost

= (14,400 hrs. × ₹ 15) – ₹2,17,500

= ₹ 1,500 (Adverse)

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

= (1,800 units × ₹400) - ₹ 7,68,000

= ₹ 7,20,000 – ₹ 7,68,000 = ₹ 48,000 (Adverse)

11. Sales Volume 5,00,000 Units

Computation of existing contribution

Particulars	Per unit (₹)	Total (₹ In lakhs)
Sales	680	3,400
Fixed Cost	200	1,000
Profit	50	250
Contribution	250	1,250
Variable Cost (Sales – Contribution)	430	2,150

(i) Break even sales in units = $\frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{₹10,00,00,000}{₹250}$ = 4,00,000 units

Break even sales in rupees = 4,00,000 units × ₹ 680 = ₹ 2,720 lakhs

OR

$$\text{P/V Ratio} = \frac{250}{680} \times 100 = 36.76\%$$

$$\text{B.EP (Rupees)} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}} = \frac{10,00,00,000}{36.76\%} = ₹\ 2,720 \text{ lakhs (approx.)}$$

(ii) Number of units sold to achieve a target profit of ₹700 lakhs:

Desired Contribution = Fixed Cost + Target Profit

= 1,000 L + 700 L = 1,700 L

$$\text{Number of units to be sold} = \frac{\text{Desired Contribution}}{\text{Contribution per uni}} = \frac{17,00,00,000}{250} = 6,80,000 \text{ units}$$

(iii) Profit if selling price is increased by 10% and sales volume drops by 10%:

Existing Selling Price per unit = ₹ 680

Revised selling price per unit = ₹ 680 × 110% = ₹748

Existing Sales Volume = 5,00,000 units

Revised sales volume = 5,00,000 units – 10% of 5,00,000 = 4,50,000 units.

Statement of profit at sales volume of 4,50,000 units @ ₹ 748 per unit

Particulars	Per unit (₹)	Total (₹ In lakhs)
Sales	748	3,366
Less: Variable Costs	430	1,935
Contribution	318	1,431
Less: Fixed Cost		1,000
Profit		**431**

(iv) Volume to be achieved to earn target profit of ₹700 lakhs with revised selling price and reduction of 10% in variable costs and ₹170 lakhs in fixed cost:

Revised selling price per unit = ₹748

Variable costs per unit existing = ₹430

Revised Variable Costs

Reduction of 10% in variable costs = ₹ 430 – 10% of 430

= ₹ 430 – ₹43

= ₹387

Total Fixed Cost (existing) = ₹ 1,000 lakhs

Reduction in fixed cost = ₹ 170 lakhs

Revised fixed cost	= ₹ 1,000 lakhs – ₹ 170 lakhs = ₹830 lakhs
Revised Contribution (unit)	= Revised selling price per unit – Revised Variable Costs per units
Revised Contribution per unit	= ₹748 – ₹387 = ₹361
Desired Contribution	= Revised Fixed Cost + Target Profit
	= ₹ 830 lakhs + ₹700 lakhs = ₹1,530 lakhs
No. of units to be sold	$= \frac{\text{Desired Contribution}}{\text{Contribution per unit}} = \frac{₹15,30,00,000}{₹361}$
	= 4,23,823 units

12. (i) Product-wise Profitability Statement for the FY 2019-20:

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
Output (units)	8,000	4,000	
Selling price per unit	600	550	
Sales value	48,00,000	22,00,000	70,00,000
Direct material	11,20,000 (₹140×8,000)	6,30,000 (₹157.50×4,000)	17,50,000
Direct wages	7,20,000 (₹90×8,000)	5,30,000 (₹132.5×4,000)	12,50,000
Variable factory overheads	5,47,200 (76%of 7,20,000)	4,02,800 (76%of 5,30,000)	9,50,000
Other variable costs	3,20,000 (₹40×8,000)	2,80,000 (₹70×4,000)	6,00,000
Contribution	20,92,800	3,57,200	24,50,000
Fixed factory overheads	-	-	12,00,000
Other fixed costs	-	-	4,00,000
Profit			**8,50,000**

(ii) Preparation of Budget for the FY 2020-21:

Particulars	Product-X (₹)	Product-Y (₹)	Total (₹)
Output (units)	6,400 (8,000×80%)	3,600 (4,000×90%)	
Selling price per unit	480 (600×80%)	440 (550×80%)	

Sales value	30,72,000	15,84,000	46,56,000
Direct material	8,96,000 (₹140×6,400)	5,67,000 (₹157.50×3,600)	14,63,000
Direct wages per unit	6,91,200 (₹108×6,400)	5,72,400 (₹159×3,600)	12,63,600
Variable factory overheads	5,25,312 (76%of 6,91,200)	4,35,024 (76%of 5,72,400)	9,60,336
Other variable costs	2,56,000 (₹40×6,400)	2,52,000 (₹70×3,600)	5,08,000
Contribution	7,03,488	(2,42,424)	4,61,064
Fixed factory overheads	-	-	12,00,000
Other fixed costs (110%of ₹4,00,000)	-	-	4,40,000
Profit/ (Loss)			**(11,78,936)**

13. (a) (i) **Discretionary Cost Centre:** The cost centre whose output cannot be measured in financial terms, thus input-output ratio cannot be defined. The cost of input is compared with allocated budget for the activity. Example of discretionary cost centres are Research & Development department, Advertisement department where output of these department cannot be measured with certainty and co-related with cost incurred on inputs.

(ii) Investment Centres: These are the responsibility centres which are not only responsible for profitability but also has the authority to make capital investment decisions. The performance of these responsibility centres are measured on the basis of Return on Investment (ROI) besides profit. Examples of investment centres are Maharatna, Navratna and Miniratna companies of Public Sector Undertakings of Central Government.

(b) Advantages of Cost plus contracts are as follows:

(i) The Contractor is assured of a fixed percentage of profit. There is no risk of incurring any loss on the contract.

(ii) It is useful specially when the work to be done is not definitely fixed at the time of making the estimate.

(iii) Contractee can ensure himself about 'the cost of the contract', as he is empowered to examine the books and documents of the contractor to ascertain the veracity of the cost of the contract.

(c) The advantages of zero-based budgeting are as follows:

- It provides a systematic approach for the evaluation of different activities and ranks them in order of preference for the allocation of scarce resources.
- It ensures that the various functions undertaken by the organization are critical for the achievement of its objectives and are being performed in the best possible way.
- It provides an opportunity to the management to allocate resources for various activities only after having a thorough cost-benefit-analysis. The chances of arbitrary cuts and enhancement are thus avoided.
- The areas of wasteful expenditure can be easily identified and eliminated.
- Departmental budgets are closely linked with corporation objectives.
- The technique can also be used for the introduction and implementation of the system of 'management by objective.' Thus, it cannot only be used for fulfillment of the objectives of traditional budgeting but it can also be used for a variety of other purposes.

(d) This product costing system is used when an entity produces more than one variant of final product using different materials but with similar conversion activities. This means conversion activities are similar for all the product variants but materials differ significantly. Operation Costing method is also known as Hybrid product costing system as materials costs are accumulated by job order or batch wise but conversion costs i.e. labour and overheads costs are accumulated by department, and process costing methods are used to assign these costs to products. Moreover, under operation costing, conversion costs are applied to products using a predetermined application rate. This predetermined rate is based on budgeted conversion costs.

The two examples of industries are Ready made garments and Jewellery making.

PART II: FINANCIAL MANAGEMENT

QUESTIONS

Time Value of Money

1. A doctor is planning to buy an X-Ray machine for his hospital. He has two options- either purchase it by making a cash payment of ₹ 5 lakhs or six equal annual installments of ₹ 1,02,500 totalling to ₹ 6,15,000. Which option do you suggest to the doctor assuming the rate of return is 12 %? Present value of annuity of Re. 1 at 12 percent rate of discount for six years is 4.111.

Ratio Analysis

2. Following information has been provided from the books of M/s Laxmi & Co. for the year ending on 31st March, 2020:

Net Working Capital	₹ 4,80,000
Bank overdraft	₹ 80,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	₹ 3,20,000
Current ratio	2.5
Liquid ratio (Quick Ratio)	1.5

You are required to prepare a summarised Balance Sheet as at 31st March, 2020.

Cost of Capital

3. Calculate the WACC using the following data by using:
   (a) Book value weights
   (b) Market value weights

   The capital structure of the company is as under:

Particulars	(₹)
Debentures (₹ 100 per debenture)	5,00,000
Preference shares (₹ 100 per share)	5,00,000
Equity shares (₹ 10 per share)	10,00,000
	20,00,000

The market prices of these securities are:

Debentures	₹ 105 per debenture
Preference shares	₹ 110 per preference share
Equity shares	₹ 24 each.

Additional information:

(i) ₹ 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10-year maturity.

(ii) ₹ 100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10-year maturity.

(iii) Equity shares has ₹ 4 floatation cost and market price ₹ 24 per share.

The next year expected dividend is ₹ 1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.

Corporate tax rate is 30%. Use YTM method to calculate cost of debentures and preference shares.

Capital Structure

4. Xylo Ltd. is considering two alternative financing plans as follows:

Particulars	Plan – A (₹)	Plan – B (₹)
Equity shares of ₹ 10 each	8,00,000	8,00,000
Preference Shares of ₹ 100 each	-	4,00,000
12% Debentures	4,00,000	-
	12,00,000	12,00,000

The indifference point between the plans is ₹ 4,80,000. Corporate tax rate is 30%. Calculate the rate of dividend on preference shares.

Leverage

5. From the following details of M/s X & Co., prepare the Income Statement for the year ended 31st March, 2020:

Financial Leverage	2
Interest	₹ 4,000
Operating Leverage	3
Variable cost as a percentage of sales	75%
Income tax rate	30%

Capital Budgeting

6. A large profit making company is considering the installation of a machine to process the waste produced by one of its existing manufacturing process to be converted into a marketable product. At present, the waste is removed by a contractor for disposal on payment by the company of ₹ 150 lakh per annum for the next four years. The contract can be terminated upon installation of the aforesaid machine on payment of a compensation of ₹ 90 lakh before the processing operation starts. This compensation is not allowed as deduction for tax purposes.

   The machine required for carrying out the processing will cost ₹ 600 lakh to be financed by a loan repayable in 4 equal instalments commencing from end of the year 1. The interest rate is 14% per annum. At the end of the 4th year, the machine can be sold for ₹ 60 lakh and the cost of dismantling and removal will be ₹ 45 lakh.

   Sales and direct costs of the product emerging from waste processing for 4 years are estimated as under:

   (₹ In lakh)

Year	1	2	3	4
Sales	966	966	1,254	1,254
Material consumption	90	120	255	255
Wages	225	225	255	300
Other expenses	120	135	162	210
Factory overheads	165	180	330	435
Depreciation (as per income tax rules)	150	114	84	63

   Initial stock of materials required before commencement of the processing operations is ₹ 60 lakh at the start of year 1. The stock levels of materials to be maintained at the end of year 1, 2 and 3 will be ₹ 165 lakh and the stocks at the end of year 4 will be nil. The storage of materials will utilise space which would otherwise have been rented out for ₹ 30 lakh per annum. Labour costs include wages of 40 workers, whose transfer to this process will reduce idle time payments of ₹ 45 lakh in the year - 1 and ₹ 30 lakh in the year - 2. Factory overheads include apportionment of general factory overheads except to the extent of insurance charges of ₹ 90 lakh per annum payable on this venture. The company's tax rate is 30%.

   Present value factors for four years are as under:

Year	1	2	3	4
PV factors @14%	0.877	0.769	0.674	0.592

   Advise the management on the desirability of installing the machine for processing the waste. All calculations should form part of the answer.

Management of Receivables (Debtors)

7. A company wants to follow a more prudent policy to improve its sales for the region which is ₹ 9 lakhs per annum at present, having an average collection period of 45 days. After certain researches, the management consultant of the company reveals the following information:

Credit Policy	Increase in collection period	Increase in sales	Present default anticipated
W	15 days	₹ 60,000	1.5%
X	30 days	₹ 90,000	2%
Y	45 days	₹ 1,50,000	3%
Z	70 days	₹ 2,10,000	4%

The selling price per unit is ₹ 3. Average cost per unit is ₹ 2.25 and variable costs per unit are ₹ 2. The current bad debt loss is 1%. Required return on additional investment is 20%. (Assume 360 days year)

Analyse which of the above policies would you recommend for adoption?

Management of working Capital

8. The following figures and ratios are related to a company:

(i)	Sales for the year (all credit)	₹ 90,00,000
(ii)	Gross Profit ratio	35 percent
(iii)	Fixed assets turnover (based on cost of goods sold)	1.5
(iv)	Stock turnover (based on cost of goods sold)	6
(v)	Liquid ratio	1.5:1
(vi)	Current ratio	2.5:1
(vii)	Receivables (Debtors) collection period	1 month
(viii)	Reserves and surplus to Share capital	1:1.5
(ix)	Capital gearing ratio	0.7875
(x)	Fixed assets to net worth	1.3 : 1

You are required to prepare:

(a) Balance Sheet of the company on the basis of above details.

(b) The statement showing working capital requirement, if the company wants to make a provision for contingencies @ 15 percent of net working capital.

Cash Flow Statement

9. Balance Sheet of X Pvt. Ltd. as on 31st March, 2019 and 31st March, 2020 are furnished below:

(₹ in crore)

	Particulars	Note No.	31st March, 2020	31st March, 2019
I	**Equity and Liabilities:**			
(1)	Shareholders' funds			
	(a) Share Capital		140	140
	(b) Reserves and surplus		110	92
(2)	Non-current liabilities			
	(a) Long-term borrowings		135	40
(3)	Current liabilities			
	(a) Trade Payables		380	460
	(b) Other current liabilities		220	210
	(c) Provision for Current Tax		15	8
	Total		**1,000**	**950**
II	**Assets:**			
(1)	Non-current assets			
	(a) Fixed Assets (tangible)			
	(i) Plant and equipment		430	309
	Less: Accumulated Depreciation		(218)	(194)
			212	115
	(b) Investment Property		60	75
(2)	Current Assets			
	(a) Inventories		305	260
	(b) Trade receivable		280	370
	(c) Cash and cash equivalents		26	10
	(d) Other Current Assets		117	120
	Total		**1,000**	**950**

Income Statement (extract) for the year ending 31st March, 2020 ***(₹ in crore)***

Sales	1,000
Less : Cost of goods sold	(530)
Gross margin	470
Less : Operating expenses	(352)
Net operating income	118
Non-operating items:	
Loss on sale of equipment	(4)
Profit before taxes	114
Less : Provision for income-taxes	(48)
Net Profit	66

Additional information:

(i) Dividends of ₹ 48 crores were paid in February, 2020.

(ii) The loss on sale of equipment of ₹ 4 crore reflects a transaction in which equipment with an original cost of ₹ 12 crore and accumulated depreciation of ₹ 5 crore were sold for ₹ 3 crore in cash.

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

Miscellaneous

10. (a) Explain agency problem and agency cost. How to address the issues of the same.

(b) Compare between Financial Lease and Operating Lease.

SUGGESTED HINTS/ANSWERS

1. **Option I:** Cash Down Payment

Cash down payment = ₹ 5,00,000

Option II: Annual Installment Basis

Annual Installment = ₹ 1,02,500

Present Value of 1 to 6 installments @12%

= ₹ 1,02,500 × 4.111

= ₹ 4,21,378

Advise: The doctor should buy X-Ray machine on installment basis because the present value of cash outflows is lower than cash down payment. This means Option II is better than Option I.

2. Working notes:

(i) Current Assets and Current Liabilities computation:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2.5}{1}$$

Or Current assets	=	2.5 Current liabilities
Now, Working capital	=	Current assets – Current liabilities
Or ₹ 4,80,000	=	2.5 Current liability – Current liability
Or 1.5 Current liability	=	₹ 4,80,000
∴ Current Liabilities	=	₹ 3,20,000
So, Current Assets	=	₹ 3,20,000 × 2.5 = ₹ 8,00,000

(ii) Computation of stock

Liquid ratio	=	$\frac{\text{Liquid assets}}{\text{Current liabilities}}$
Or 1.5	=	$\frac{\text{Current assets - Inventories}}{₹\ 3,20,000}$
Or 1.5 × ₹ 3, 20,000	=	₹ 8,00,000 – Inventories
Or Inventories	=	₹ 8,00,000 – ₹ 4, 80,000
Or Stock	=	₹ 3,20,000

(iii) Computation of Proprietary fund; Fixed assets; Capital and Sundry creditors

Fixed Asset to Proprietary ratio	=	$\frac{\text{Fixed assets}}{\text{Proprietary fund}} = 0.75$
∴ Fixed Assets	=	0.75 Proprietary fund (PF)[FA+NWC = PF]
or NWC	=	PF- FA [(i.e. .75 PF)]
and Net Working Capital (NWC)	=	0.25 Proprietary fund
Or ₹ 4,80,000/0.25	=	Proprietary fund
Or Proprietary fund	=	₹ 19,20,000
and Fixed Assets	=	0.75 proprietary fund

	=	0.75 × ₹ 19,20,000 = ₹ 14,40,000
Capital	=	Proprietary fund – Reserves & Surplus
	=	₹ 19,20,000 – ₹ 3,20,000 = ₹ 16,00,000
Sundry Creditors	=	(Current liabilities – Bank overdraft)
	=	(₹ 3,20,000 – ₹ 80,000) = ₹ 2,40,000

Balance Sheet as at 31st March, 2020

Liabilities	₹	Assets	₹
Capital	16,00,000	Fixed Assets	14,40,000
Reserves & Surplus	3,20,000	Stock	3,20,000
Bank overdraft	80,000	Other Current Assets	4,80,000
Sundry creditors	2,40,000		
	22,40,000		22,40,000

3. (i) Cost of Equity (K_e)

$= \frac{D1}{P0-F} + g = \frac{₹\,1}{₹\,24 - ₹\,4} + 0.05 = 0.1$ or 10%

(ii) Cost of Debt (K_d)

Current market price (P_0) – floatation cost = I(1-t) × PVAF(r,10) + RV × PVIF(r,10)

₹ 105 – 4% of ₹ 105 = ₹ 10 (1-0.3) × PVAF (r,10) + ₹ 100 × PVIF (r,10)

Calculation of NPV at discount rate of 5% and 7%

Year	Cash flows (₹)	Discount factor @ 5%	Present Value	Discount factor @ 7%	Present Value (₹)
0	100.8	1.000	(100.8)	1.000	(100.8)
1 to 10	7	7.722	54.05	7.024	49.17
10	100	0.614	61.40	0.508	50.80
NPV			+14.65		-0.83

Calculation of IRR

$$IRR = 5\% + \frac{14.65}{14.65-(-0.83)}(7\%-5\%) = 5\% + \frac{14.65}{15.48}(7\%-5\%) = 6.89\%$$

Cost of Debt (K_d) = 6.89%

(iii) Cost of Preference shares (K_p)

Current market price (P_0) – floatation cost = PD × PVAF(r,10) + RV × PVIF(r,10)

₹ 110 – 2% of ₹ 110 = ₹ 5 × PVAF (r,10) + ₹ 100 × PVIF (r,10)

Calculation of NPV at discount rate of 3% and 5%

Year	Cash flows (₹)	Discount factor @ 3%	Present Value	Discount factor @ 5%	Present Value (₹)
0	107.8	1.000	(107.8)	1.000	(107.8)
1 to 10	5	8.530	42.65	7.722	38.61
10	100	0.744	74.40	0.614	61.40
NPV			+9.25		-7.79

Calculation of IRR

$$\text{IRR} = 3\% + \frac{9.25}{9.25-(-7.79)}(5\%-3\%) = 3\% + \frac{9.25}{17.04}(5\%-3\%) = 4.08\%$$

Cost of Preference Shares (K_p) = 4.08%

(a) Calculation of WACC using book value weights

Source of capital	Book Value	Weights	After tax cost of capital	WACC (K_o)
	(₹)	(a)	(b)	(c) = (a)×(b)
10% Debentures	5,00,000	0.25	0.0689	0.01723
5% Preference shares	5,00,000	0.25	0.0408	0.0102
Equity shares	10,00,000	0.50	0.10	0.05000
	20,00,000	1.00		0.07743

WACC (K_o) = 0.07743 or 7.74%

(b) Calculation of WACC using market value weights

Source of capital	Market Value	Weights	After tax cost of capital	WACC (K_o)
	(₹)	(a)	(b)	(c) = (a)×(b)
10% Debentures (₹ 105× 5,000)	5,25,000	0.151	0.0689	0.0104

5% Preference shares (₹ 110× 5,000)	5,50,000	0.158	0.0408	0.0064
Equity shares (₹ 24× 1,00,000)	24,00,000	0.691	0.10	0.0691
	34,75,000	1.000		0.0859

WACC (K_o) = 0.0859 or 8.59%

4. Computation of Rate of Preference Dividend

$$\frac{(\text{EBIT}-\text{Interest})\ (1-t)}{\text{No.of Equity Shares } (N_1)} = \frac{\text{EBIT}\ (1-t)-\text{Preference Dividend}}{\text{No.of Equity Shares } (N_2)}$$

$$\frac{(₹\,4,80,000 - ₹\,48,000)\,x\,(1-0.30)}{80,00,000 \text{ shares}} = \frac{₹\,4,80,000(1-0.30) - \text{Preference Dividend}}{80,00,000 \text{ shares}}$$

$$\frac{(₹\,3,02,400}{80,00,000 \text{ shares}} = \frac{₹\,3,36,000 - \text{Preference Dividend}}{80,00,000 \text{ shares}}$$

₹ 3,02,400 = ₹ 3,36,000 – Preference Dividend

Preference Dividend = ₹ 3,36,000 – ₹ 3,02,400 = ₹ 33,600

$$\text{Rate of Dividend} = \frac{\text{Preference Dividend}}{\text{Preference share capital}} \times 100$$

$$= \frac{₹\,33,600}{4,00,000} \times 100 = 8.4\%$$

5. Workings:

(i) Financial Leverage $= \frac{\text{EBIT}}{\text{EBIT}-\text{Interest}}$

Or, $2 = \frac{\text{EBIT}}{\text{EBIT} - ₹4,000}$

Or, EBIT = ₹ 8,000

(ii) Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

Or, $3 = \frac{\text{Contribution}}{`8,000}$

Or, Contribution = ₹ 24,000

(iii) Sales $= \frac{\text{Contribution}}{\text{P/V Ratio}} = \frac{₹\,24,000}{25\%} = ₹\ 96,000$

(iv) Fixed Cost:

Contribution – Fixed cost = EBIT

₹ 24,000 – Fixed cost = ₹ 8,000

Or, Fixed cost = ₹ 16,000

Income Statement for the year ended 31st March, 2020

Particulars	Amount (₹)
Sales	96,000
Less: Variable Cost (75% of ₹ 96,000)	(72,000)
Contribution	24,000
Less: Fixed Cost (Contribution - EBIT)	(16,000)
Earnings Before Interest and Tax (EBIT)	8,000
Less: Interest	(4,000)
Earnings Before Tax (EBT)	4,000
Less: Income Tax @ 30%	(1,200)
Earnings After Tax (EAT or PAT)	**2,800**

6. Statement of Operating Profit from processing of waste ***(₹ in lakh)***

Year	1	2	3	4
Sales :(A)	966	966	1,254	1,254
Material consumption	90	120	255	255
Wages	180	195	255	300
Other expenses	120	135	162	210
Factory overheads (insurance only)	90	90	90	90
Loss of rent on storage space (opportunity cost)	30	30	30	30
Interest @14%	84	63	42	21
Depreciation (as per income tax rules)	150	114	84	63
Total cost: (B)	744	747	918	969
Profit (C)=(A)-(B)	222	219	336	285
Tax (30%)	66.6	65.7	100.8	85.5
Profit after Tax (PAT)	155.4	153.3	235.2	199.5

Statement of Incremental Cash Flows *(₹ in lakh)*

Year	0	1	2	3	4
Material stock	(60)	(105)	-	-	165
Compensation for contract	(90)	-	-	-	-
Contract payment saved	-	150	150	150	150
Tax on contract payment	-	(45)	(45)	(45)	(45)
Incremental profit	-	222	219	336	285
Depreciation added back	-	150	114	84	63
Tax on profits	-	(66.6)	(65.7)	(100.8)	(85.5)
Loan repayment	-	(150)	(150)	(150)	(150)
Profit on sale of machinery (net)	-	-	-	-	15
Total incremental cash flows	(150)	155.4	222.3	274.2	397.5
Present value factor	1.00	0.877	0.769	0.674	0.592
Present value of cash flows	(150)	136.28	170.95	184.81	235.32
Net present value					577.36

Advice: Since the net present value of cash flows is ₹ 577.36 lakh which is positive the management should install the machine for processing the waste.

Notes:

(i) Material stock increases are taken in cash flows.

(ii) Idle time wages have also been considered.

(iii) Apportioned factory overheads are not relevant only insurance charges of this project are relevant.

(iv) Interest calculated at 14% based on 4 equal instalments of loan repayment.

(v) Sale of machinery- Net income after deducting removal expenses taken. Tax on Capital gains ignored.

(vi) Saving in contract payment and income tax thereon considered in the cash flows.

7. A. Statement showing the Evaluation of Debtors Policies (Total Approach)

(Amount in ₹)

Particulars		Present Policy 45 days	Proposed Policy W 60 days	Proposed Policy X 75 days	Proposed Policy Y 90 days	Proposed Policy Z 115 days
I.	**Expected Profit:**					
	(a) Credit Sales	9,00,000	9,60,000	9,90,000	10,50,000	11,10,000

	(b) Total Cost other than Bad Debts					
	(i) Variable Costs [Sales × 2/ 3]	6,00,000	6,40,000	6,60,000	7,00,000	7,40,000
	(ii) Fixed Costs	75,000	75,000	75,000	75,000	75,000
		6,75,000	7,15,000	7,35,000	7,75,000	8,15,000
	(c) Bad Debts	9,000	14,400	19,800	31,500	44,400
	(d) Expected Profit [(a) – (b) – (c)]	2,16,000	2,30,600	2,35,200	2,43,500	2,50,600
II.	**Opportunity Cost of Investments in Receivables**	16,875	23,833	30,625	38,750	52,069
III.	**Net Benefits (I – II)**	1,99,125	2,06,767	2,04,575	2,04,750	1,98,531

Recommendation: The Proposed Policy W (i.e. increase in collection period by 15 days or total 60 days) should be adopted since the net benefits under this policy are higher as compared to other policies.

Working Notes:

(i) Calculation of Fixed Cost = [Average Cost per unit – Variable Cost per unit] × No. of Units sold

= [₹ 2.25 - ₹ 2.00] × (₹ 9,00,000/3)

= ₹ 0.25 × 3,00,000 = ₹ 75,000

(ii) Calculation of Opportunity Cost of Average Investments

Opportunity Cost = Total Cost × $\frac{\text{Collection period}}{360} \times \frac{\text{Rate of Return}}{100}$

Present Policy = 6,75,000 × $\frac{45}{360} \times \frac{20}{100}$ = 16,875

Policy W = 7,15,000 × $\frac{60}{360} \times \frac{20}{100}$ = 23,833

Policy X = 7,35,000 × $\frac{75}{360} \times \frac{20}{100}$ = 30,625

Policy Y = 7,75,000 × $\frac{90}{360} \times \frac{20}{100}$ = 38,750

Policy Z = 8,15,000 × $\frac{115}{360} \times \frac{20}{100}$ = 52,069

B. Another method of solving the problem is **Incremental Approach**. Here we assume that sales are all credit sales. ***(Amount in ₹)***

Particulars		Present Policy 45 days	Proposed Policy W 60 days	Proposed Policy X 75 days	Proposed Policy Y 90 days	Proposed Policy Z 115 days
I.	**Incremental Expected Profit:**					
	(a) Incremental Credit Sales	0	60,000	90,000	1,50,000	2,10,000
	(b) Incremental Costs					
	(i) Variable Costs	6,00,000	40,000	60,000	1,00,000	1,40,000
	(ii) Fixed Costs	75,000	-	-	-	-
	(c) Incremental Bad Debt Losses	**9,000**	**5,400**	**10,800**	**22,500**	**35,400**
	(d) Incremental Expected Profit (a – b –c)]		14,600	19,200	27,500	34,600
II.	**Required Return on Incremental Investments:**					
	(a) Cost of Credit Sales	6,75,000	7,15,000	7,35,000	7,75,000	8,15,000
	(b) Collection period	45	60	75	90	115
	(c) Investment in Receivable (a × b/360)	84,375	1,19,167	1,53,125	1,93,750	2,60,347
	(d) Incremental Investment in Receivables	-	34,792	68,750	1,09,375	1,75,972
	(e) Required Rate of Return (in %)		20	20	20	20
	(f) Required Return on Incremental Investments (d × e)	**-**	**6,958**	**13,750**	**21,875**	**35,194**
III.	**Net Benefits (I – II)**	**-**	7,642	5,450	5,625	(594)

Recommendation: The Proposed Policy W should be adopted since the net benefits under this policy are higher than those under other policies.

C. Another method of solving the problem is by computing the **Expected Rate of Return.**

$$\text{Expected Rate of Return} = \frac{\text{Incremental Expected Profit}}{\text{Incremental Investment in Receivables}} \times 100$$

For Policy W = $\frac{₹14,600}{₹34,792}$ x 100 = 41.96%

For Policy X = $\frac{₹19,200}{₹68,750}$ x 100 = 27.93%

For Policy Y = $\frac{₹27,500}{₹1,09,375}$ x 100 = 25.14%

For Policy Z = $\frac{₹34,600}{₹1,75,972}$ x 100 = 19.66%

Recommendation: The Proposed Policy W should be adopted since the Expected Rate of Return (41.96%) is more than the Required Rate of Return (20%) and is highest among the given policies compared.

8. Working Notes:

(i) Cost of Goods Sold = Sales – Gross Profit (35% of Sales)
= ₹ 90,00,000 – ₹ 31,50,000
= ₹ 58,50,000

(ii) Closing Stock = Cost of Goods Sold / Stock Turnover
= ₹ 58,50,000/6 = ₹ 9,75,000

(iii) Fixed Assets = Cost of Goods Sold / Fixed Assets Turnover
= ₹ 58,50,000/1.5
= ₹ 39,00,000

(iv) Current Assets:
Current Ratio = 2.5 and Liquid Ratio = 1.5
Inventories (Stock) = 2.5 – 1.5 = 1
Current Assets = Amount of Inventories (Stock) × 2.5/1
= ₹ 9,75,000 × 2.5/1 = ₹ 24,37,500

(v) Liquid Assets (Receivables and Cash)
= Current Assets – Inventories (Stock)

= ₹ 24,37,500 – ₹ 9,75,000

= ₹14,62,500

(vi) Receivables (Debtors) = Sales × Debtors Collection period /12

= ₹ 90,00,000 × 1/12

= ₹ 7,50,000

(vii) Cash = Liquid Assets – Receivables (Debtors)

= ₹14,62,500 – ₹ 7,50,000 = ₹ 7,12,500

(viii) Net worth = Fixed Assets /1.3

= ₹ 39,00,000/1.3 = ₹ 30,00,000

(ix) Reserves and Surplus

Reserves and Share Capital = Net worth

Net worth = 1 + 1.5 = 2.5

Reserves and Surplus = ₹ 30,00,000 × 1/2.5

= ₹ 12,00,000

(x) Share Capital = Net worth – Reserves and Surplus

= ₹ 30,00,000 – ₹ 12,00,000

= ₹ 18,00,000

(xi) Current Liabilities = Current Assets/ Current Ratio

= ₹ 24,37,500/2.5 = ₹ 9,75,000

(xii) Long-term Debts

Capital Gearing Ratio = Long-term Debts / Equity Shareholders' Fund

Long-term Debts = ₹30,00,000 × 0.7875 = ₹23,62,500

(a) Balance Sheet of the Company

Particulars	Figures as at 31-03-2020 (₹)	Figures as at 31-03-2019 (₹)
I. EQUITY AND LIABILITIES		
Shareholders' funds		
(a) Share capital	18,00,000	-
(b) Reserves and surplus	12,00,000	-

	Non-current liabilities		
	(a) Long-term borrowings	23,62,500	-
	Current liabilities	9,75,000	-
	TOTAL	**63,37,500**	**-**
II.	**ASSETS**		
	Non-current assets		
	Fixed assets	39,00,000	-
	Current assets		
	Inventories	9,75,000	-
	Trade receivables	7,50,000	-
	Cash and cash equivalents	7,12,500	-
	TOTAL	**63,37,500**	**-**

(b) Statement Showing Working Capital Requirement

Particulars	**(₹)**	**(₹)**
A. Current Assets		
(i) Inventories (Stocks)		9,75,000
(ii) Receivables (Debtors)		7,50,000
(iii) Cash in hand & at bank		7,12,500
Total Current Assets		24,37,500
B. Current Liabilities:		
Total Current Liabilities		9,75,000
Net Working Capital (A – B)		14,62,500
Add: Provision for contingencies (15% of Net Working Capital)		2,19,375
Working capital requirement		16,81,875

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

Particulars	**(₹ in crore)**
Cash flow from Operating Activities	
Profit before taxation	114
Adjustments:	
Add: Loss on sale of equipment	4
Add: Depreciation (₹ 218 + ₹ 5 – ₹ 194)	29
Operating profit before working capital changes	147

Decrease in trade receivable (₹ 370 – ₹ 280)	90
Increase in inventory (₹ 305 – ₹ 260)	(45)
Decrease in other current assets (₹ 120 – ₹ 117)	3
Decrease in trade payable (₹ 460 – ₹ 380)	(80)
Increase in other current liabilities (₹ 220 – ₹ 210)	10
Cash generated from operations	125
Less: Income tax paid (₹ 8 + ₹ 48 - ₹ 15)	(41)
Net Cash from Operating activities (A)	84
Cash flow from Investing Activities	
Purchase of plant and equipment (₹ 430 + ₹ 12 – ₹ 309)	(133)
Sale of investments (₹ 75 – ₹ 60)	15
Sale of plant and equipment	3
Net cash from Investing activities (B)	(115)
Cash Flow from Financing Activities	
Payment of dividend	(48)
Long term borrowings (₹ 135 – ₹ 40)	95
Net cash from Financing activities (C)	47
Net Increase/(Decrease) in cash and cash equivalents (A+B+C)	16
Cash and cash equivalent at the beginning of the year	10
Cash and cash equivalent at the end of the year	**26**

10. (a) Though in a sole proprietorship firm, partnership etc., owners participate in management but in corporates, owners are not active in management so, there is a separation between owner/ shareholders and managers. In theory managers should act in the best interest of shareholders, however, in reality, managers may try to maximise their individual goal like salary, perks etc., so there is a **principal agent relationship between managers and owners, which is known as Agency Problem**. In a nutshell, Agency Problem is the chances that managers may place personal goals ahead of the goal of owners. Agency Problem leads to Agency Cost. Agency cost is the additional cost borne by the shareholders to monitor the manager and control their behaviour so as to maximise shareholders wealth. Generally, Agency Costs are of four types (i) monitoring (ii) bonding (iii) opportunity (iv) structuring.

Addressing the agency problem

The agency problem arises if manager's interests are not aligned to the interests of the debt lender and equity investors. The agency problem of debt lender would be addressed by imposing negative covenants i.e. the managers cannot borrow beyond a point. This is one of the most important concepts of modern day finance and the

application of this would be applied in the Credit Risk Management of Bank, Fund Raising, Valuing distressed companies.

Agency problem between the managers and shareholders can be addressed if the interests of the managers are aligned to the interests of the shareholders. It is easier said than done.

However, following efforts have been made to address these issues:

- Managerial compensation is linked to profit of the company to some extent and also with the long term objectives of the company.
- Employee is also designed to address the issue with the underlying assumption that maximisation of the stock price is the objective of the investors.
- Effecting monitoring can be done.

(b)

	Finance Lease	Operating Lease
1.	The risk and reward incident to ownership are passed on to the lessee. The lessor only remains the legal owner of the asset.	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belong wholly to the lessor.
2.	The lessee bears the risk of obsolescence.	The lessor bears the risk of obsolescence.
3.	The lessor is interested in his rentals and not in the asset. He must get his principal back along with interest. Therefore, the lease is non-cancellable by either party.	As the lessor does not have difficulty in leasing the same asset to other willing lessor, the lease is kept cancelable by the lessor.
4.	The lessor enters into the transaction only as financier. He does not bear the cost of repairs, maintenance or operations.	Usually, the lessor bears cost of repairs, maintenance or operations.
5.	The lease is usually full payout, that is, the single lease repays the cost of the asset together with the interest.	The lease is usually non-payout, since the lessor expects to lease the same asset over and over again to several users.