

- (i) Current system of wages and incentive payment system is followed
- (ii) Workers' demand for time rate wages and Halsey premium plan is accepted.
- (b) Mr. K, during the month of October 2015, has produced 1,050 units. What will be impact on his earning if he will be able to produce the same number of units in next month also. Should he support the workers' demand?
- (Take 4 working weeks in a month)

Overheads

3. PQR manufacturers – a small scale enterprise, produces a single product and has adopted a policy to recover the production overheads of the factory by adopting a single blanket rate based on machine hours. The annual budgeted production overheads for the year 2015-16 are ₹ 44,00,000 and budgeted annual machine hours are 2,20,000.

For a period of first six months of the financial year 2015 -2016, following information were extracted from the books:

Actual production overheads	₹ 24,88,200
Amount included in the production overheads:	
Paid as per court's order	₹ 1,28,000
Expenses of previous year booked in current year	₹ 1,200
Paid to workers for strike period under an award	₹ 44,000
Obsolete stores written off	₹ 6,700

Production and sales data of the concern for the first six months are as under:

Production:

Finished goods	24,000 units
Works-in-progress	
(50% complete in every respect)	18,000 units

Sale:

Finished goods	21,600 units
----------------	--------------

The actual machine hours worked during the period were 1,16,000 hours. It is revealed from the analysis of information that $\frac{1}{4}$ of the under/ over absorption was due to defective production policies and the balance was attributable to increase/decrease in costs.

Required:

- (i) Determine the amount of under/over absorption of production overheads for the six months period of 2015-16.
- (ii) Show the accounting treatment of under/ over absorption of production overheads, and

(iii) Apportion the under/ over absorbed overheads over the items.

Non-integrated Accounting

4. As of 31st March, 2015, the following balances existed in a firm's cost ledger, which is maintained separately on a double entry basis:

	Debit(₹)	Credit(₹)
Stores Ledger Control A/c	3,20,000	–
Work-in-progress Control A/c	1,52,000	–
Finished Goods Control A/c	2,56,000	–
Manufacturing Overhead Control A/c	–	28,000
Cost Ledger Control A/c	–	7,00,000
	7,28,000	7,28,000

During the next quarter, the following items arose:

	(₹)
Finished Product (at cost)	2,35,500
Manufacturing overhead incurred	91,000
Raw material purchased	1,36,000
Factory wages	48,000
Indirect labour	20,600
Cost of sales	1,68,000
Materials issued to production	1,26,000
Sales returned (at cost)	8,000
Materials returned to suppliers	11,000
Manufacturing overhead charged to production	86,000

You are required to prepare the Cost Ledger Control A/c, Stores Ledger Control A/c, Work-in-progress Control A/c, Finished Stock Ledger Control A/c, Manufacturing Overhead Control A/c, Wages Control A/c, Cost of Sales A/c and the Trial Balance at the end of the quarter as per costing records.

Contract Costing

5. Get – Homes Constructions has undertaken three separate building contracts. Information relating to these contracts for the year 2014-15 are as under:

	Contract –I (Amount in ₹'000)	Contract –II (Amount in ₹'000)	Contract –III (Amount in ₹'000)
Value of contract	17,500	14,500	24,500
Balance as on 01-04-2014:			
Work completed and certified	--	4,100	8,150
Materials at site	--	220	310
Plant & Machinery (WDV)	--	770	3,760
Wages outstanding	--	48	104
Profit transferred to Costing P/L A/c.	--	--	350
Transaction during the year:			
Materials issued to the sites	870	2,150	4,020
Wages paid to workers	450	1,160	2,180
Salary to site staffs	90	85	135
Travelling and other expenses	18	24	32
Plants issued to sites	910	240	680
Apportionment of Head office expenses	110	90	126
Balance as on 31-03-2015:			
Materials at site	215	152	12
Plant & Machinery (WDV)	728	808	3,552
Wages outstanding	52	98	146
Value of work certified	2,000	8,600	24,000
Cost of work not certified	800	452	560

As per the contract agreement 15% of the certified value of the contract is kept by the contractees as retention money. The Contract-III is scheduled to be completed in the coming months, however, this contract required a further estimated cost of ₹ 7,20,000 to get it completed.

Required:

- Prepare Contract Statement for each of the three contracts and calculate the notional/ estimated profit/ loss
- Calculate the profit/ loss to be transferred to Costing Profit & Loss Account for internal managerial purpose.

Process Costing

6. Star Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes and the company uses a FIFO process costing system to value work-in-process and finished goods. At the end of the last month, a fire occurred in the factory and destroyed some of the paper files containing records of the process operations for the month.

Star Ltd. needs your help to prepare the process accounts for the month during which the fire occurred. You have been able to gather some information about the month's operating activities but some of the information could not be retrieved due to the damage. The following information was salvaged:

- Opening work-in-process at the beginning of the month was 800 litres, 70% complete for labour and 60% complete for overheads. Opening work-in-process was valued at ₹ 26,640.
- Closing work-in-process at the end of the month was 160 litres, 30% complete for labour and 20% complete for overheads.
- Normal loss is 10% of input and total losses during the month were 1,800 litres partly due to the fire damage.
- Output sent to finished goods warehouse was 4,200 litres.
- Losses have a scrap value of ₹15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹39 for the month made up as follows:

	(₹)
Raw Material	23
Labour	7
Overheads	9
	39

Required:

- (a) Calculate the quantity (in litres) of raw material inputs during the month.
- (b) Calculate the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.
- (c) Calculate the values of raw material, labour and overheads added to the process during the month.
- (d) Prepare the process account for the month.

Standard Costing

7. Jigyasa Pharmaceuticals Ltd. is engaged in producing dietary supplement 'Funkids' for growing children. It produces 'Funkids' in a batch of 10 kgs. Standard material inputs required for 10 kgs. of 'Funkids' are as below:

Material	Quantity (in kgs.)	Rate per kg. (in ₹)
Vita-X	5	110
Proto-D	3	320
Mine-L	3	460

During the month of March, 2015, actual production was 5,000 kgs. of 'Funkids' for which the actual quantities of material used for a batch and the prices paid thereof are as under:

Material	Quantity (in kgs.)	Rate per kg. (in ₹)
Vita-X	6	115
Proto-D	2.5	330
Mine-L	2	405

You are required to calculate the following variances based on the above given information for the month of March, 2015 for Jigyasa Pharmaceuticals Ltd.:

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

Marginal Costing

8. T Ltd produces a single product 'T-10' and sells it at a fixed price of ₹ 2,050 per unit. The production and sales data for first quarter of the year 2014-15 are as follows:

	April	May	June
Sales in units	4,200	4,500	5,200
Production in units	4,600	4,400	5,500

Actual/budget information for each month was as follows:

Direct materials	4 kilograms at ₹120 per kilogram
Direct labour	6 hours at ₹60 per hour

Variable production overheads	150% of direct labour
Sales commission	15% of sales value
Fixed production overheads	₹ 5,00,000
Fixed selling overheads	₹ 95,000

There was no opening inventory at the start of the quarter. Fixed production overheads are budgeted at ₹ 60,00,000 per annum and are absorbed into products based on a budgeted normal output of 60,000 units per annum.

Required:

- Prepare a profit statement for each of the three months using absorption costing principles.
- Prepare a profit statement for each of the three months using marginal costing principles.
- Present a reconciliation of the profit or loss figures given in your answer to (a) and (b).

Budget and Budgetary Control

9. G Ltd. manufactures two products called 'M' and 'N'. Both products use a common raw material Z. The raw material Z is purchased @ ₹ 36 per kg from the market. The company has decided to review inventory management policies for the forthcoming year.

The following forecast information has been extracted from departmental estimates for the year ended 31st March 2016 (the budget period):

	Product M	Product N
Sales (units)	28,000	13,000
Finished goods stock increase by year-end	320	160
Post-production rejection rate (%)	4	6
Material Z usage (per completed unit, net of wastage)	5 kg	6 kg
Material Z wastage (%)	10	5

Additional information:

- Usage of raw material Z is expected to be at a constant rate over the period.
- Annual cost of holding one unit of raw material in stock is 11% of the material cost.
- The cost of placing an orders is ₹ 320 per order.
- The management of G Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

Required:

- (a) Prepare functional budgets for the year ended 31st March 2016 under the following headings:
 - (i) Production budget for Products M and N (in units).
 - (ii) Purchases budget for Material Z (in kgs and value).
- (b) Calculate the Economic Order Quantity for Material Z (in kgs).
- (c) If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration, calculate the maximum number of units of Product M and N that could be produced.

Miscellaneous

10. (a) Define Product costs. Describe three different purposes for computing product costs.
- (b) What do you understand by Operating Costs? Describe its essential features and state where it can be usefully implemented?
- (c) How apportionment of joint costs upto the point of separation amongst the joint products using market value at the point of separation and net realizable value method is done? Discuss.
- (d) Explain:
 - (i) Pre-production Costs
 - (ii) Research and Development Costs
 - (iii) Training Costs

SUGGESTED HINTS/ANSWERS

1. (i) Calculation of Economic Order Quantity:

$$EOQ = \sqrt{\frac{2 \times A \times O}{C_i}} = \sqrt{\frac{2 \times (60,000 \text{ packs} \times 12 \text{ months}) \times ₹ 240}{₹ 228 \times 10\%}}$$

= 3,893.3 packs or 3,893 packs.

- (ii) Number of orders per year

$$\frac{\text{Annual requirements}}{\text{E.O.Q}} = \frac{7,20,000 \text{ packs}}{3,893 \text{ packs}} = 184.9 \text{ or } 185 \text{ orders a year}$$

(iii) Ordering and storage costs

	(₹)
Ordering costs :- 185 orders × ₹ 240	44,400.00
Storage cost :- ½ (3,893 packs × 10% of ₹228)	44,380.20
Total cost of ordering & storage	<u>88,780.20</u>

(iv) Timing of next order

(a) Day's requirement served by each order.

$$\text{Number of days requirements} = \frac{\text{No. of working days}}{\text{No. of order in a year}} = \frac{360 \text{ days}}{185 \text{ orders}} = 1.94 \text{ days}$$

supply.

This implies that each order of 3,893 packs supplies for requirements of 1.94 days only.

(b) Days requirement covered by inventory

$$= \frac{\text{Units in inventory}}{\text{Economic order quantity}} \times (\text{Day's requirement served by an order})$$

$$\therefore \frac{10,033 \text{ packs}}{3,893 \text{ packs}} \times 1.94 \text{ days} = 5 \text{ days requirement}$$

(c) Time interval for placing next order

Inventory left for day's requirement – Average lead time of delivery

$$5 \text{ days} - 5 \text{ days} = 0 \text{ days}$$

This means that next order for the replenishment of supplies has to be placed immediately.

2. (a) Calculation of Total wages and average wages per worker per month.

(i) When Current system of wages and incentive payment system is followed:

		Worst case	Optimal case	Best case
I	Standard Production (in units) (45 hours × 4 units × 4 weeks × 118 workers)	84,960	84,960	84,960
II	No. of units to be produced	42,400	84,960	1,27,400
III	Efficiency {(II ÷ I) × 100}	49.91%	100%	149.95%

IV	Differential piece rate*	₹10 (₹12.5 × 0.8)	₹15 (₹12.5 × 1.2)	₹15 (₹12.5 × 1.2)
V	Total Wages (II × IV)	₹4,24,000	₹12,74,400	₹19,11,000
VI	Average wages per worker (V ÷ 118)	₹3,593.22	₹10,800	₹16,194.92

*For efficiency less than 100%, 83% of piece rate and for efficiency more than or equals to 100%, 125% of piece rate may also be taken.

(ii) When workers' demand for time rate wages and Halsey premium plan is accepted:

		Worst case	Optimal case	Best case
I	No. of units expected to be produced (units)	42,400	84,960	1,27,400
II	Standard no. units in an hour (units)	4	4	4
III	Standard Hours (I ÷ II)	10,600	21,240	31,850
IV	Expected working hours (45 hours × 4 weeks × 118 workers)	21,240	21,240	21,240
V	Hours to be saved (III – IV)	--	--	10,610
VI	Time wages (IV × ₹50)	₹10,62,000	₹10,62,000	₹10,62,000
VII	Incentive under Halsey Premium Plan $\left(\frac{1}{2} \times \text{Time saved} \times ₹50\right)$	--	--	₹2,65,250
VIII	Total Wages (VI + VII)	₹10,62,000	₹10,62,000	₹13,27,250
IX	Average wages per worker (VIII ÷ 118)	₹9,000	₹9,000	₹11,247.88

(b) Calculation of gain or loss in the current monthly income of Mr. K:

Wages earned in October 2015:		
	Standard production unit (45 hours × 4 weeks × 4 units)	720 units
	No. of units produced	1,050 units
	Efficiency	145.83%
	Differential piece rate (refer the above part)	₹15
I	Total wages (1,050 units × ₹15)	₹15,750

Expected wages under the new scheme		
	Standard hours (1,050 units ÷ 4 units)	262.50 hours
	Expected hours to be taken (45 hours × 4 weeks)	180 hours
	Time saved	82.50 hours
	Time wages (180 hours × ₹50)	₹9,000
	Incentive $\left(\frac{1}{2} \times \text{Time saved} \times ₹50\right)$	₹2,062.50
II	Total expected wages	₹11,062.50
	Loss from the proposed scheme (II – I)	₹4,687.50

Supporting the demand of colleague workers will cost ₹4,687.50 in the next month to Mr. K.

3. (i) Amount of under/ over absorption of production overheads during the period of first six months of the year 2015-2016:

	Amount (₹)	Amount (₹)
Total production overheads actually incurred during the period		24,88,200
<i>Less:</i> Amount paid to worker as per court order	1,28,000	
Expenses of previous year booked in the current year	1,200	
Wages paid for the strike period under an award	44,000	
Obsolete stores written off	6,700	(1,79,900)
		23,08,300
<i>Less:</i> Production overheads absorbed as per machine hour rate (1,16,000 hours × ₹20*)		23,20,000
Amount of over absorbed production overheads		11,700

$$\text{*Budgeted Machine hour rate (Blanket rate)} = \frac{₹44,00,000}{2,20,000 \text{ hours}} = ₹ 20 \text{ per hour}$$

- (ii) **Accounting treatment of over absorbed production overheads:** As, one fourth of the over absorbed overheads were due to defective production policies, this being abnormal, hence should be transferred to Costing Profit and Loss Account.

Amount to be transferred to Costing Profit and Loss Account = $(11,700 \times \frac{1}{4})$ ₹ 2,925

Balance of over absorbed production overheads should be distributed over Works in progress, Finished goods and Cost of sales by applying supplementary rate*.

Amount to be distributed = $(11,700 \times \frac{3}{4})$ ₹ 8,775

Supplementary rate = $\frac{₹ 8,875}{33,000 \text{ units}}$ = ₹ 0.2689 per unit

- (iii) Apportionment of under absorbed production overheads over WIP, Finished goods and Cost of sales:

	Equivalent completed units	Amount (₹)
Work-in-Progress (18,000 units × 50% × ₹ 0.2689)	9,000	2,420
Finished goods (2,400 units × ₹ 0.2689)	2,400	646
Cost of sales (21,600 units × ₹ 0.2689)	21,600	5,809
Total	33,000	8,875

4.

Cost Ledger Control Account

	(₹)		(₹)
To Store Ledger Control A/c	11,000	By Opening Balance	7,00,000
To Balance c/d	9,84,600	By Store ledger control A/c	1,36,000
		By Manufacturing Overhead Control A/c	91,000
		By Wages Control A/c	68,600
	9,95,600		9,95,600

Stores Ledger Control Account

	(₹)		(₹)
To Opening Balance	3,20,000	By WIP Control A/c	1,26,000
To Cost ledger control A/c	1,36,000	By Cost ledger control A/c (Returns)	11,000
		By Balance c/d	3,19,000
	4,56,000		4,56,000

WIP Control Account

	(₹)		(₹)
To Opening Balance	1,52,000	By Finished Stock Ledger Control A/c	2,35,500
To Wages Control A/c	48,000	By Balance c/d	1,76,500
To Stores Ledger Control A/c	1,26,000		
To Manufacturing Overhead Control A/c	86,000		
	4,12,000		4,12,000

Finished Stock Ledger Control Account

	(₹)		(₹)
To Opening Balance	2,56,000	By Cost of Sales	1,68,000
To WIP Control A/c	2,35,500	By Balance c/d	3,31,500
To Cost of Sales A/c (Sales Return)	8,000		
	4,99,500		4,99,500

Manufacturing Overhead Control Account

	(₹)		(₹)
To Cost Ledger Control A/c	91,000	By Opening Balance	28,000
To Wages Control A/c	20,600	By WIP Control A/c	86,000
To Over recovery c/d	2,400		
	1,14,000		1,14,000

Wages Control Account

	(₹)		(₹)
To Transfer to Cost Ledger Control A/c	68,600	By WIP Control A/c	48,000
		By Manufacturing Overhead Control A/c	20,600
	68,600		68,600

Cost of Sales Account

	(₹)		(₹)
To Finished Stock Ledger Control A/c	1,68,000	By Finished Stock Ledger Control A/c (Sales return)	8,000
		By Balance c/d	1,60,000
	1,68,000		1,68,000

Trial Balance

	(₹)	(₹)
Stores Ledger Control A/c	3,19,000	
WIP Control A/c	1,76,500	
Finished Stock Ledger Control A/c	3,31,500	
Manufacturing Overhead Control A/c	--	2,400
Cost of Sales A/c	1,60,000	
Cost ledger control A/c	--	9,84,600
	9,87,000	9,87,000

5. (a) **Contract Statement** (Amount in ₹'000)

	Contract-I (₹)	Contract-II (₹)	Contract-III (₹)
Balance as on 01-04-2014:			
- Work completed and certified	--	4,100	8,150
- Materials at site	--	220	310
- Plant & Machinery	--	770	3,760
Transaction during the year:			
Materials issued	870	2,150	4,020
Wages paid to workers	450	1,160	2,180
Less: Outstanding at beginning	--	(48)	(104)
Add: Outstanding at closing	52	98	146
Salary to site staffs	90	85	135
Travelling and other expenses	18	24	32
Plant issued to sites	910	240	680
Apportionment of Head office expenses	110	90	126
Estimated additional cost	--	--	720
Total (A)	2,500	8,889	20,155

© The Institute of Chartered Accountants of India

Balance as on 31-03-2015			
- Materials at site	215	152	12
- Plant & Machinery	728	808	3,552
- Work in progress:			
- Value of work certified	2,000	8,600	24,000
- Cost of work not certified	800	452	560
Total (B)	3,743	10,012	28,124
Notional/ estimated profit {(B) – (A)}	1,243	1,123	7,969

(b) Profit to be transferred to Costing Profit and Loss Account for internal purpose:

	Contract-I	Contract-II	Contract-III
Value of Contract	17,500	14,500	24,500
Value of work certified	2,000	8,600	24,000
Percentage of completion (%) $\left(\frac{\text{Work certified}}{\text{Value of contract}} \times 100 \right)$	11.43	59.31	97.96
Notional/ Estimated profit	1,243	1,123	7,969
Profit to be transferred to Costing Profit & loss A/c	Nil	636.37 $\left(\frac{2}{3} \times ₹1,123 \times 85\% \right)$	6,285.47 $\{ (7,969 \times 97.96\% \times 85\%) - 350 \}$

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

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	800	Transfer to Finished Goods	4,200
Raw material input (balancing figure)	5,360	Process Losses	1,800
		Closing WIP	160
	6,160		6,160

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

	Litres
Total process losses for month	1,800
Normal Loss (10% input)	536
Abnormal Loss (balancing figure)	1,264

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

	Material	Labour	Overheads
Cost per equivalent unit	₹23.00	₹7.00	₹9.00
Equivalent units (litre) (refer the working note)	4,824	4,952	5,016
Cost of equivalent units	₹1,10,952	₹34,664	₹45,144
Add: Scrap value of normal loss (536 units × ₹ 15)	₹8,040	--	--
Total value added	₹1,18,992	₹34,664	₹45,144

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	800	Units completed:							
Units introduced	5,360	- Opening WIP	800	--	--	240	30	320	40
		- Fresh inputs	3,400	3,400	100	3,400	100	3,400	100
		Normal loss	536	--	--	--	--	--	--
		Abnormal loss	1,264	1,264	100	1,264	100	1,264	100
		Closing WIP	160	160	100	48	30	32	20
	6,160		6,160	4,824		4,952		5,016	

(d) Process Account for Month

	Litres	Amount (₹)		Litres	Amount (₹)
To Opening WIP	800	26,640	By Finished goods	4,200	1,63,800
To Raw Materials	5,360	1,18,992	By Normal loss	536	8,040
To Wages	--	34,664	By Abnormal loss	1,264	49,296
To Overheads	--	45,144	By Closing WIP	160	4,304
	6,160	2,25,440		6,160	2,25,440

7.

Material	SQ* × SP	AQ** × SP	AQ** × AP	RSQ*** × SP
Vita-X	₹ 2,75,000 (2,500 kg. × ₹ 110)	₹ 3,30,000 (3,000 kg. × ₹ 110)	₹ 3,45,000 (3,000 kg. × ₹ 115)	₹ 2,62,460 (2,386 kg. × ₹ 110)
Proto-D	₹ 4,80,000 (1,500 kg. × ₹ 320)	₹ 4,00,000 (1,250 kg. × ₹ 320)	₹ 4,12,500 (1,250 kg. × ₹ 330)	₹ 4,58,240 (1,432 kg. × ₹ 320)
Mine-L	₹ 6,90,000 (1,500 kg. × ₹ 460)	₹ 4,60,000 (1,000 kg. × ₹ 460)	₹ 4,05,000 (1,000 kg. × ₹ 405)	₹ 6,58,720 (1,432 kg. × ₹ 460)
Total	₹ 14,45,000	₹ 11,90,000	₹ 11,62,500	₹ 13,79,420

* Standard Quantity of materials for actual output :

Vita-X	$= \frac{5 \text{ kgs.}}{10 \text{ kgs}} \times 5,000 \text{ kgs.} = 2,500 \text{ kgs.}$
Proto-D	$= \frac{3 \text{ kgs.}}{10 \text{ kgs}} \times 5,000 \text{ kgs.} = 1,500 \text{ kgs.}$
Mine-L	$= \frac{3 \text{ kgs.}}{10 \text{ kgs}} \times 5,000 \text{ kgs.} = 1,500 \text{ kgs.}$

** Actual Quantity of Material used for actual output:

Vita-X	$= \frac{6 \text{ kgs.}}{10 \text{ kgs}} \times 5,000 \text{ kgs.} = 3,000 \text{ kgs.}$
Proto-D	$= \frac{2.5 \text{ kgs.}}{10 \text{ kgs}} \times 5,000 \text{ kgs.} = 1,250 \text{ kgs.}$
Mine-L	$= \frac{2 \text{ kgs.}}{10 \text{ kgs}} \times 5,000 \text{ kgs.} = 1,000 \text{ kgs.}$

*** Revised Standard Quantity (RSQ):

Vita-X	$= \frac{5 \text{ kgs.}}{11 \text{ kgs}} \times 5,250 \text{ kgs.} = 2,386 \text{ kgs.}$
Proto-D	$= \frac{3 \text{ kgs.}}{11 \text{ kgs}} \times 5,250 \text{ kgs.} = 1,432 \text{ kgs.}$
Mine-L	$= \frac{3 \text{ kgs.}}{11 \text{ kgs}} \times 5,250 \text{ kgs.} = 1,432 \text{ kgs.}$

(i) **Material Cost Variance** = (Std. Qty. × Std. Price) – (Actual Qty. × Actual Price)

Or	= (SQ × SP) – (AQ × AP)		
Vita-X	= ₹ 2,75,000 - ₹ 3,45,000	= ₹ 70,000	(A)
Proto-D	= ₹ 4,80,000 - ₹ 4,12,500	= ₹ 67,500	(F)
Mine-L	= ₹ 6,90,000 - ₹ 4,05,000	= ₹ 2,85,000	(F)
		<u>₹ 2,82,500</u>	(F)

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

	= (AQ × SP) – (AQ × AP)		
Vita-X	= ₹ 3,30,000 - ₹ 3,45,000	= ₹ 15,000	(A)
Proto-D	= ₹ 4,00,000 - ₹ 4,12,500	= ₹ 12,500	(A)
Mine-L	= ₹ 4,60,000 - ₹ 4,05,000	= ₹ 55,000	(F)
		<u>₹ 27,500</u>	(F)

(iii) **Material Usage Variance** = Std. Price (Std. Qty. – Actual Qty.)

Or	= (SQ × SP) – (AQ × SP)		
Vita-X	= ₹ 2,75,000 - ₹ 3,30,000	= ₹ 55,000	(A)
Proto-D	= ₹ 4,80,000 - ₹ 4,00,000	= ₹ 80,000	(F)
Mine-L	= ₹ 6,90,000 - ₹ 4,60,000	= ₹ 2,30,000	(F)
		<u>₹ 2,55,000</u>	(F)

(iv) **Material Mix Variance** = Std. Price (Revised Std. Qty. – Actual Qty.)

Or	= (RSQ × SP) – (AQ × SP)		
Vita-X	= ₹ 2,62,460 - ₹ 3,30,000	= ₹ 67,540	(A)
Proto-D	= ₹ 4,58,240 - ₹ 4,00,000	= ₹ 58,240	(F)
Mine-L	= ₹ 6,58,720 - ₹ 4,60,000	= ₹ 1,98,720	(F)
		<u>₹ 1,89,420</u>	(F)

(v) **Material Yield Variance** = Std. Price (Std. Qty. – Revised Std. Qty.)

Or	= (SQ × SP) – (RSQ × SP)		
Vita-X	= ₹ 2,75,000 - ₹ 2,62,460	= ₹ 12,540	(F)
Proto-D	= ₹ 4,80,000 - ₹ 4,58,240	= ₹ 21,760	(F)
Mine-L	= ₹ 6,90,000 - ₹ 6,58,720	= ₹ 31,280	(F)
		<u>= ₹ 65,580</u>	<u>(F)</u>

8. (a) **Statement of Profit under Absorption Costing**

Particulars	April (₹)	May (₹)	June (₹)
Sales (units)	4,200	4,500	5,200
Selling price per unit	2,050	2,050	2,050
Sales value (A)	86,10,000	92,25,000	1,06,60,000
Cost of Goods Sold:			
- Opening Stock @ ₹1,480	0	5,92,000	4,44,000
- Production cost @ ₹1,480	68,08,000	65,12,000	81,40,000
- Closing Stock @ ₹1,480	(5,92,000)	(4,44,000)	(8,88,000)
- Under/ (Over) absorption	40,000	60,000	(50,000)
Add: Fixed Selling Overheads	95,000	95,000	95,000
Cost of Sales (B)	63,51,000	68,15,000	77,41,000
Profit (A – B)	22,59,000	24,10,000	29,19,000

Workings:

1. **Calculation of full production cost**

	(₹)
Direct Materials (4 kg. × ₹ 120)	480
Direct labour (6 hours × ₹ 60)	360
Variable production Overhead (150% of ₹ 360)	540
Total Variable cost	1,380
Fixed production overhead $\left(\frac{₹60,00,000}{60,000 \text{ units}} \right)$	100
	<u>1,480</u>

2. Calculation of Opening and Closing stock

	April	May	June
Opening Stock	0	400	300
Add: Production	4,600	4,400	5,500
Less: Sales	4,200	4,500	5,200
Closing Stock	400	300	600

3. Calculation of Under/Over absorption of fixed production overhead

	April (₹)	May (₹)	June (₹)
Actual Overhead	5,00,000	5,00,000	5,00,000
Overhead absorbed	4,60,000 (4,600 units × ₹100)	4,40,000 (4,600 units × ₹100)	5,50,000 (4,600 units × ₹100)
Under/(Over) absorption	40,000	60,000	(50,000)

(b) Statement of Profit under Marginal Costing

Particulars	April (₹)	May (₹)	June (₹)
Sales (units)	4,200	4,500	5,200
Selling price per unit	2,050	2,050	2,050
Sales value	86,10,000	92,25,000	1,06,60,000
Less: Variable production cost	57,96,000	62,10,000	71,76,000
Contribution	28,14,000	30,15,000	34,84,000
Less: Fixed Production Overheads	5,00,000	5,00,000	5,00,000
Less: Fixed Selling Overheads	95,000	95,000	95,000
Profit	22,19,000	24,20,000	28,89,000

(c) Reconciliation of profit under Absorption costing to Marginal Costing

Particulars	April (₹)	May (₹)	June (₹)
Profit under Absorption Costing	22,59,000	24,10,000	29,19,000
Add: Opening Stock	0	40,000 (400 × ₹ 100)	30,000 (300 × ₹ 100)
Less: Closing Stock	40,000 (400 × ₹ 100)	30,000 (300 × ₹ 100)	60,000 (600 × ₹ 100)
Profit under Marginal Costing	22,19,000	24,20,000	28,89,000

9. (a) (i) Production Budget (in units) for the year ended 31st March 2016

	Product M	Product N
Budgeted sales (units)	28,000	13,000
Add: Increase in closing stock	320	160
No. good units to be produced	28,320	13,160
Post production rejection rate	4%	6%
No. of units to be produced	29,500	14,000
	$\left(\frac{28,320}{0.96} \right)$	$\left(\frac{13,160}{0.94} \right)$

(ii) Purchase budget (in kgs and value) for Material Z

	Product M	Product N
No. of units to be produced	29,500	14,000
Usage of Material Z per unit of production	5 kg.	6 kg.
Material needed for production	1,47,500 kg.	84,000 kg.
Materials to be purchased	1,63,889 kg.	88,421 kg.
	$\left(\frac{1,47,500}{0.90} \right)$	$\left(\frac{84,000}{0.95} \right)$
Total quantity to be purchased	2,52,310 kg.	
Rate per kg. of Material Z	₹36	
Total purchase price	₹90,83,160	

(b) Calculation of Economic Order Quantity for Material Z

$$EOQ = \sqrt{\frac{2 \times 2,52,310 \text{ kg.} \times ₹320}{₹36 \times 11\%}} = \sqrt{\frac{16,14,78,400}{₹3.96}} = 6,385.72 \text{ kg.}$$

(c) Since, the maximum number of order per year can not be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of Material Z that can be available for production:

$$= 4,000 \text{ kg.} \times 40 \text{ orders} = 1,60,000 \text{ kg.}$$

	Product M	Product N
Material needed for production to maintain the same production mix	1,03,929 kg.	56,071 kg.
	$\left(1,60,000 \times \frac{1,63,889}{2,52,310} \right)$	$\left(1,60,000 \times \frac{88,421}{2,52,310} \right)$

Less: Process wastage	10,393 kg.	2,804 kg.
Net Material available for production	93,536 kg.	53,267 kg.
Units to be produced	18,707 units $\left(\frac{93,536 \text{ kg.}}{5 \text{ kg.}} \right)$	8,878 units $\left(\frac{53,267 \text{ kg.}}{6 \text{ kg.}} \right)$

10. (a) Definition of product costs: Product costs are inventoriable costs. These are the costs, which are assigned to the product. Under marginal costing variable manufacturing costs and under absorption costing, total manufacturing costs constitute product costs.

Purposes for computing product costs:

The three different purposes for computing product costs are as follows:

- (i) *Preparation of financial statements:* Here focus is on inventoriable costs.
 - (ii) *Product pricing:* It is an important purpose for which product costs are used. For this purpose, the cost of the areas along with the value chain should be included to make the product available to the customer.
 - (iii) *Contracting with government agencies:* For this purpose government agencies may not allow the contractors to recover research and development and marketing costs under cost plus contracts.
- (b) Operating Costs are the costs incurred by undertakings which do not manufacture any product but provide a service. Such undertakings for example are — Transport concerns, Gas agencies; Electricity Undertakings; Hospitals; Theatres etc. Because of the varied nature of activities carried out by the service undertakings, the cost system used is obviously different from that followed in manufacturing concerns.

The essential features of operating costs are as follows:

- (1) The operating costs can be classified under three categories. For example in the case of transport undertaking these three categories are as follows:
 - (a) Operating and running charges: It includes expenses of variable nature. For example expenses on petrol, diesel, lubricating oil, and grease etc.
 - (b) Maintenance charges: These expenses are of semi-variable nature and includes the cost of tyres and tubes, repairs and maintenance, spares and accessories, overhaul, etc.
 - (c) Fixed or standing charges: These includes garage rent, insurance, road licence, depreciation, interest on capital, salary of operating manager, etc.
- (2) The cost unit used is composite like passenger-mile; Kilowatt-hour, etc.

It can be implemented in all firms of transport, airlines, bus-service, etc., and by all firms of distribution undertakings.

(c) **Apportionment of Joint Cost amongst Joint Products using:**

Market value at the point of separation

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

Net realizable value Method

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

- Estimated profit margins
- Selling & distribution expenses, if any
- Post split off costs.

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

- (d) (i) **Pre-production Costs:** These costs forms the part of development cost, incurred in making a trial production run, preliminary to formal production. These costs are incurred when a new factory is in the process of establishment or a new project is undertaken or a new product line or product is taken up, but there is no established or formal production to which such costs may be charged.
- (ii) **Research and Development Costs:** Research costs are the costs incurred for the original and planned investigation undertaken with a prospect of gaining new scientific or technical knowledge and understanding.
- Development costs are the cost incurred in applying research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services prior to the commencement of commercial production or use.
- (iii) **Training Costs:** Costs which are incurred in and in relation to providing training to the workers, apprentices, executives etc. Training cost consists of wages and salaries paid to new trainees, fees paid to trainers, cost of materials and properties used to train the trainees, costs associated with training centre, loss suffered due to lower production and extra spoilage etc. The total cost of training section is thereafter apportioned to production centers.

PART II: FINANCIAL MANAGEMENT
QUESTIONS

Time Value of Money

1. You need a sum of ₹ 1,00,000 at the end of 10 years. You know that the best you can do is to deposit some lump sum amount today at 6% rate of interest or to make equal payments into a bank account, starting a year from now on which you can earn 6% interest. Find out
- What amount to be deposited today or
 - What amount must be deposited annually?

Ratio Analysis

2. Based on the following particulars show various assets and liabilities of Tirupati Ltd.

Fixed assets turnover ratio	8 times
Capital turnover ratio	2 times
Inventory Turnover	8 times
Receivable turnover	4 times
Payable turnover	6 times
GP Ratio	25%

Gross profit during the year amounts to ₹ 8,00,000. There is no long-term loan or overdraft. Reserve and surplus amount to ₹ 2,00,000. Ending inventory of the year is ₹ 20,000 above the beginning inventory.

Cash Flow Analysis

3. Balance Sheets of RIO Ltd. as on 31st March, 2014 and 2015 were as follows:

Liabilities	31.3.14 (₹)	31.3.15 (₹)	Assets	31.3.14 (₹)	31.3.15 (₹)
Equity Share Capital	10,00,000	10,00,000	Goodwill	1,00,000	80,000
8% Preference Share Capital	2,00,000	3,00,000	Land and Building	7,00,000	6,50,000
General Reserve	1,20,000	1,45,000	Plant & Machinery	6,00,000	6,60,000
Securities Premium	--	25,000	Investments (non-trading)	2,40,000	2,20,000
Profit and Loss A/c	2,10,000	3,00,000	Stock	4,00,000	3,85,000
11% Debentures	5,00,000	3,00,000	Debtors	2,88,000	4,15,000
Creditors	1,85,000	2,15,000	Cash and Bank	88,000	93,000

Provision for tax	80,000	1,05,000	Prepaid Expenses	15,000	11,000
Proposed Dividend	1,36,000	1,44,000	Premium on Redemption of Debentures	--	20,000
	24,31,000	25,34,000		24,31,000	25,34,000

Additional Information:

- Investments were sold during the year at a profit of ₹ 15,000.
- During the year an old machine costing ₹ 80,000 was sold for ₹ 36,000. Its written down value was ₹ 45,000.
- Depreciation charged on Plants and Machinery @ 20 per cent on the opening balance.
- There was no purchase or sale of Land and Building.
- Provision for tax made during the year was ₹ 96,000.
- Preference shares were issued for consideration of cash during the year.

You are required to prepare:

- Cash flow statement as per AS- 3.
- Schedule of Changes in Working Capital.

Cost of Capital

- Navya Limited wishes to raise additional capital of ₹10 lakhs for meeting its modernisation plans. It has ₹ 3,00,000 in the form of retained earnings available for investments purposes. The following are the further details:

Debt/equity mix	40%/60%
Cost of debt (before tax)	
Upto ₹ 1,80,000	10%
Beyond ₹ 1,80,000	16%
Earnings per share	₹ 4
Dividend pay out	₹ 2
Expected growth rate in dividend	10%
Current market price per share	₹ 44
Tax rate	50%

You are required:

- To ascertain the pattern for raising the additional finance.

- (b) To calculate the post-tax average cost of additional debt.
- (c) To calculate the cost of retained earnings and cost of equity, and
- (d) Find out the overall weighted average cost of capital (after tax).

Capital Structure Decisions

5. Company P and Q are identical in all respects including risk factors except for debt/equity, company P having issued 10% debentures of ₹ 18 lakhs while company Q is unlevered. Both the companies earn 20% before interest and taxes on their total assets of ₹ 30 lakhs.

Assuming a tax rate of 50% and capitalization rate of 15% from an all-equity company. Compute the value of companies P and Q using (i) Net Income Approach and (ii) Net Operating Income Approach.

Leverage

6. A firm has sales of ₹ 75,00,000 variable cost is 56% and fixed cost is ₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000.
- (i) What is the firm's ROI?
 - (ii) Does it have favourable financial leverage?
 - (iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?
 - (iv) What are the operating, financial and combined leverages of the firm?
 - (v) If the sales is increased by 10% by what percentage EBIT will increase?
 - (vi) At what level of sales the EBT of the firm will be equal to zero?
 - (vii) If EBIT increases by 20%, by what percentage EBT will increase?

Capital Budgeting

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

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

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

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

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

You are required to:

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

The cost of capital of BT Labs is 12%.

Management of Payables (Creditors)

8. A Ltd. is in the manufacturing business and it acquires raw material from X Ltd. on a regular basis. As per the terms of agreement the payment must be made within 40 days of purchase. However A Ltd. has a choice of paying ₹ 98.50 per ₹ 100 it owes to X Ltd. on or before 10th day of purchase. Should A Ltd. accept the offer of discount assuming average billing of A Ltd. with X Ltd. is ₹ 10,00,000 and an alternative investment yield a return of 15% and company pays the invoice.

Financing of Working Capital

9. Following information is forecasted by the Puja Limited for the year ending 31st March, 2015:

	Balance as at 1 st April, 2014 (₹)	Balance as at 31 st March, 2015 (₹)
Raw Material	45,000	65,356
Work-in-progress	35,000	51,300
Finished goods	60,181	70,175
Debtors	1,12,123	1,35,000
Creditors	50,079	70,469
Annual purchases of raw material (all credit)		4,00,000

Annual cost of production		7,50,000
Annual cost of goods sold		9,15,000
Annual operating cost		9,50,000
Annual sales (all credit)		11,00,000

You may take one year as equal to 365 days.

You are required to calculate:

- (i) Net operating cycle period.
- (ii) Number of operating cycles in the year.
- (iii) Amount of working capital requirement using operating cycles.

Miscellaneous

10. (a) "The profit maximization is not an operationally feasible criterion." Comment on it.
- (b) Write short notes on the following:
 - (i) Bridge Finance
 - (ii) Floating Rate Bonds
 - (iii) Packing Credit.
- (c) "Financial Leverage is a double edged sword" Comment.

SUGGESTED HINTS/ANSWERS

$$1. \quad (i) \quad PV = \frac{FV}{(1+k)^n} \quad \text{or,} \quad PV = \frac{₹1,00,000}{(1+0.06)^{10}}$$

$$= ₹ 55,839.48$$

$$(ii) \quad FVA(k,n) = A \left[\frac{(1+k)^n - 1}{k} \right]$$

$$A = \frac{FVA(k,n)}{\left[\frac{(1+k)^n - 1}{k} \right]} = \frac{₹1,00,000}{13.181} = ₹ 7,586.68$$

$$2. \quad (a) \quad G.P. \text{ ratio} = \frac{\text{Gross Profit}}{\text{Sales}} = 25\%$$

$$\text{Sales} = \frac{\text{Gross Profit}}{25} \times 100 = \frac{\text{₹ 8,00,000}}{25} \times 100 = \text{₹ 32,00,000}$$

- (b) Cost of Sales = Sales – Gross profit
 = ₹ 32,00,000 - ₹ 8,00,000
 = ₹ 24,00,000
- (c) Receivable turnover = $\frac{\text{Sales}}{\text{Debtors}} = 4$
 = Debtors = $\frac{\text{Sales}}{4} = \frac{\text{₹ 32,00,000}}{4} = \text{₹ 8,00,000}$
- (d) Fixed assets turnover = $\frac{\text{Cost of Sales}}{\text{Fixed Assets}} = 8$
 Fixed assets = $\frac{\text{Cost of Sales}}{8} = \frac{\text{₹ 24,00,000}}{8} = \text{₹ 3,00,000}$
- (e) Inventory turnover = $\frac{\text{Cost of Sales}}{\text{Average Stock}} = 8$
 Average Stock = $\frac{\text{Cost of Sales}}{8} = \frac{\text{₹ 24,00,000}}{8} = \text{₹ 3,00,000}$
 Average Stock = $\frac{\text{Opening Stock} + \text{Closing Stock}}{2}$
 Average Stock = $\frac{\text{Opening Stock} + \text{Opening Stock} + 20,000}{2}$
 Average Stock = Opening Stock + ₹ 10,000
 Opening Stock = Average Stock - ₹ 10,000
 = ₹ 3,00,000 - ₹ 10,000
 = ₹ 2,90,000
 Closing Stock = Opening Stock + ₹ 20,000
 = ₹ 2,90,000 + ₹ 20,000 = ₹ 3,10,000
- (f) Payable turnover = $\frac{\text{Purchase}}{\text{Creditors}} = 6$
 Purchases = Cost of Sales + Increase in Stock
 = ₹ 24,00,000 + ₹ 20,000 = ₹ 24,20,000

$$\begin{aligned} \text{Creditors} &= \frac{\text{Purchase}}{6} = \frac{\text{₹ } 24,20,000}{6} = \text{₹ } 4,03,333 \\ \text{(g) Capital turnover} &= \frac{\text{Cost of Sales}}{\text{Capital Employed}} = 2 \\ \text{Capital Employed} &= \frac{\text{Cost of Sales}}{2} = \frac{\text{₹ } 24,00,000}{2} = \text{₹ } 12,00,000 \\ \text{(h) Capital} &= \text{Capital Employed} - \text{Reserves \& Surplus} \\ &= \text{₹ } 12,00,000 - \text{₹ } 2,00,000 = \text{₹ } 10,00,000 \end{aligned}$$

Balance Sheet of Tirupati Ltd as on

Liabilities	Amount (₹)	Assets	Amount (₹)
Capital	10,00,000	Fixed Assets	3,00,000
Reserve & Surplus	2,00,000	Stock	3,10,000
Creditors	4,03,333	Debtors	8,00,000
		Other Current Assets	1,93,333
	16,03,333		16,03,333

3. (i)

Cash Flow Statement
for the year ending 31st March, 2015

	(₹)	(₹)
A. Cash flow from Operating Activities		
Profit and Loss A/c as on 31.3.2015		3,00,000
Less: Profit and Loss A/c as on 31.3.2014		2,10,000
		90,000
<i>Add:</i> Transfer to General Reserve	25,000	
Provision for Tax	96,000	
Proposed Dividend	1,44,000	2,65,000
Profit before Tax		3,55,000
Adjustment for Depreciation:		
Land and Building (on building)	50,000	
Plant and Machinery	1,20,000	1,70,000
Profit on Sale of Investments		(15,000)
Loss on Sale of Plant and Machinery		9,000

Goodwill written off		20,000
Interest on 11% Debentures (see the note)		33,000
Operating Profit before Working Capital Changes		5,72,000
Adjustment for Working Capital Changes:		
Decrease in Prepaid Expenses		4,000
Decrease in Stock		15,000
Increase in Debtors		(1,27,000)
Increase in Creditors		30,000
Cash generated from Operations		4,94,000
Income tax paid		(71,000)
Net Cash Inflow from Operating Activities (a)		4,23,000
B. Cash flow from Investing Activities		
Sale of Investment		35,000
Sale of Plant and Machinery		36,000
Purchase of Plant and Machinery		(2,25,000)
Net Cash Outflow from Investing Activities (b)		(1,54,000)
C. Cash Flow from Financing Activities		
Issue of Preference Shares		1,00,000
Securities Premium received on Issue of Pref. Shares		25,000
Redemption of Debentures at premium		(2,20,000)
Dividend paid		(1,36,000)
Interest paid to Debenture holders		(33,000)
Net Cash Outflow from Financing Activities (c)		(2,64,000)
Net increase in Cash and Cash Equivalents during the year (a + b + c)		5,000
Cash and Cash Equivalents at the beginning of the year		88,000
Cash and Cash Equivalents 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 Profit and Loss A/c	96,000
	1,76,000		1,76,000

2. Investment Account

	(₹)		(₹)
To Balance b/d	2,40,000	By Bank A/c (bal. figure)	35,000
To Profit and Loss (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 bal. figure)	2,25,000	By Profit and Loss A/c (Loss on sale)	9,000
		By Depreciation	1,20,000
		By Balance c/d	6,60,000
	8,25,000		8,25,000

Note: It is assumed that the debentures are redeemed at the beginning of the year.

(ii) Schedule of Changes in Working Capital

Particulars	31 st March		Change in Working Capital	
	2014 (₹)	2015 (₹)	Increase (₹)	Decrease (₹)
Current Assets				
Stock	4,00,000	3,85,000	--	15,000
Debtors	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				
Creditors	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

4. (a) **Pattern of Raising Additional Finance**

$$\text{Equity} = 10,00,000 \times 60/100 = ₹ 6,00,000$$

$$\text{Debt} = 10,00,000 \times 40/100 = ₹ 4,00,000$$

Capital structure after Raising Additional Finance

Sources of fund	Amount (₹)
Shareholder's funds	
Equity capital (6,00,000 – 3,00,000)	3,00,000
Retained earnings	3,00,000
Debt at 10% p.a.	1,80,000
Debt at 16% p.a. (4,00,000 – 1,80,000)	2,20,000
Total funds	10,00,000

(b) **Post-tax Average Cost of Additional Debt**

$K_d = l(1 - t)$, where 'K_d' is cost of debt, 'l' is interest and 't' is tax.

$$\text{On ₹ 1,80,000} = 10\% (1 - 0.5) = 5\% \text{ or } 0.05$$

$$\text{On ₹ 2,20,000} = 16\% (1 - 0.5) = 8\% \text{ or } 0.08$$

Average Cost of Debt (Post tax) i.e.

$$K_d = \frac{(1,80,000 \times 0.05) + (2,20,000 \times 0.08)}{4,00,000} \times 100 = 6.65\% \text{ (approx)}$$

(c) **Cost of Retained Earnings and Cost of Equity applying Dividend Growth Model**

$$K_e = \frac{D_1}{P_0} + g \quad \text{or} \quad \frac{D_0(1+g)}{P_0} + g$$

$$\text{Then, } K_e = \frac{2(1.1)}{44} + 0.10 = \frac{2.2}{44} + 0.10 = 0.15 \text{ or } 15\%$$

(d) Overall Weighted Average Cost of Capital (WACC) (After Tax)

Particulars	Amount (₹)	Weights	Cost of Capital	WACC
Equity (including retained earnings)	6,00,000	0.60	15%	9.00
Debt	4,00,000	0.40	6.65%	2.66
Total	10,00,000	1.00		11.66

5. (i) Valuation under Net Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Earnings before Interest & Tax (EBIT) (20% of ₹ 30,00,000)	6,00,000	6,00,000
Less: Interest (10% of ₹ 18,00,000)	1,80,000	
Earnings before Tax (EBT)	4,20,000	6,00,000
Less: Tax @ 50%	2,10,000	3,00,000
Earnings after Tax (EAT) (available to equity holders)	2,10,000	3,00,000
Value of equity (capitalized @ 15%)	14,00,000 (2,10,000 × 100/15)	20,00,000 (3,00,000 × 100/15)
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	32,00,000	20,00,000

(ii) Valuation of Companies under Net Operating Income Approach

Particulars	P Amount (₹)	Q Amount (₹)
Capitalisation of earnings at 15% $\left(\frac{₹6,00,000(1-0.5)}{0.15} \right)$	20,00,000	20,00,000
Less: Value of debt {18,00,000 (1 - 0.5)}	9,00,000	Nil

Value of equity	11,00,000	20,00,000
Add: Total Value of debt	18,00,000	Nil
Total Value of Company	29,00,000	20,00,000

6. Income Statement

Particulars	Amount (₹)
Sales	75,00,000
Less: Variable cost (56% of 75,00,000)	42,00,000
Contribution	33,00,000
Less: Fixed costs	6,00,000
Earnings before interest and tax (EBIT)	27,00,000
Less: Interest on debt (@ 9% on ₹ 45 lakhs)	4,05,000
Earnings before tax (EBT)	22,95,000

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

$$= \frac{27,00,000}{55,00,000 + 45,00,000} \times 100 = 27\%$$

(ROI is calculated on Capital Employed)

(ii) ROI = 27% and Interest on debt is 9%, hence, it has a favourable financial leverage.

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

$$\text{Or} = \frac{\text{Net Sales}}{\text{Capital}} = \frac{75,00,000}{1,00,00,000} = 0.75$$

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

(iv) Calculation of Operating, Financial and Combined leverages

$$(a) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{33,00,000}{27,00,000} = 1.22 \text{ (approx)}$$

$$(b) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{27,00,000}{22,95,000} = 1.18 \text{ (approx)}$$

$$(c) \text{ Combined Leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{33,00,000}{22,95,000} = 1.44 \text{ (approx)}$$

$$\text{Or} = \text{Operating Leverage} \times \text{Financial Leverage} = 1.22 \times 1.18 = 1.44 \text{ (approx)}$$

- (v) Operating leverage is 1.22. So if sales is increased by 10%. EBIT will be increased by 1.22×10 i.e. 12.20% (approx)
- (vi) Since the combined Leverage is 1.44, sales have to drop by $100/1.44$ i.e. 69.44% to bring EBT to Zero

$$\begin{aligned} \text{Accordingly, New Sales} &= ₹ 75,00,000 \times (1 - 0.6944) \\ &= ₹ 75,00,000 \times 0.3056 \\ &= ₹ 22,92,000 \text{ (approx)} \end{aligned}$$

Hence at ₹ 22,92,000 sales level EBT of the firm will be equal to Zero.

- (vii) Financial leverage is 1.18. So, if EBIT increases by 20% then EBT will increase by $1.18 \times 20 = 23.6\%$ (approx)
7. Since the life span of each machine is different and time span exceeds the useful lives of each model, we shall use Equivalent Annual Cost method to decide which brand should be chosen.
- (i) If machine is used for 20 years

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

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

PVAF for 1-15 years 6.811

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

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

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

PVAF for 1-10 years 5.65

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

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

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

PVAF for 1-10 years 5.65

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

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

(ii) If machine is used for 5 years

(a) Scrap Value of Machine of Brand XYZ

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

(b) Scrap Value of Machine of Brand ABC

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

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

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

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

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

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

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

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

8. Annual Benefit of accepting the Discount

$$\frac{1.5}{100-1.50} \times \frac{365}{40-10} = 18.53\%$$

Annual Cost = Opportunity Cost of foregoing interest on investment = 15%

If average invoice amount is ₹ 10,00,000

	If discount is	
	Accepted	Not Accepted
Payment to Supplier	98,500	1,00,000
Return on investment of ₹ 98,500 for 30 days {₹ 98,500 × (30/365) × 15%}		(1,214)
	98,500	98,786

Thus, from above table it can be seen that it is cheaper to accept the discount.

9. Working Notes:

1. Raw Material Storage Period (R)

$$= \frac{\text{Average Stock of Raw Material}}{\text{Annual Consumption of Raw Material}} \times 365$$

$$= \frac{\text{₹ 45,000} + \text{₹ 65,356}}{2} \times 365$$

$$= \frac{\text{₹ 3,79,644}}{\text{₹ 3,79,644}} \times 365$$

$$= 53 \text{ days.}$$

Annual Consumption of Raw Material = Opening Stock + Purchases - Closing Stock

$$= \text{₹ 45,000} + \text{₹ 4,00,000} - \text{₹ 65,356}$$

$$= \text{₹ 3,79,644}$$

2. Work-in-Progress (WIP) Conversion Period (W)

$$\begin{aligned} \text{WIP Conversion Period} &= \frac{\text{Average Stock of WIP}}{\text{Annual Cost of Production}} \times 365 \\ &= \frac{\frac{\text{₹ } 35,000 + \text{₹ } 51,300}{2}}{\text{₹ } 7,50,000} \times 365 \\ &= 21 \text{ days} \end{aligned}$$

3. Finished Stock Storage Period (F)

$$\begin{aligned} &= \frac{\text{Average Stock of Finished Goods}}{\text{Cost of Goods Sold}} \times 365 \\ &= \frac{\text{₹ } 65,178}{\text{₹ } 9,15,000} \times 365 = 26 \text{ days.} \end{aligned}$$

$$\begin{aligned} \text{Average Stock} &= \frac{\text{₹ } 60,181 + \text{₹ } 70,175}{2} \\ &= \text{₹ } 65,178. \end{aligned}$$

4. Debtors Collection Period (D)

$$\begin{aligned} &= \frac{\text{Average Debtors}}{\text{Annual Credit Sales}} \times 365 \\ &= \frac{\text{₹ } 1,23,561.50}{\text{₹ } 11,00,000} \times 365 \\ &= 41 \text{ days} \end{aligned}$$

$$\text{Average debtors} = \frac{\text{₹ } 1,12,123 + \text{₹ } 1,35,000}{2} = \text{₹ } 1,23,561.50$$

5. Creditors Payment Period (C)

$$\begin{aligned} &= \frac{\text{Average Creditors}}{\text{Annual Net Credit Purchases}} \times 365 \\ &= \frac{\left(\frac{\text{₹ } 50,079 + \text{₹ } 70,469}{2} \right)}{\text{₹ } 4,00,000} \times 365 = 55 \text{ days} \end{aligned}$$

(i) Operating Cycle Period

$$= R + W + F + D - C = 53 + 21 + 26 + 41 - 55 = 86 \text{ days}$$

(ii) Number of Operating Cycles in the Year

$$= \frac{365}{\text{Operating Cycle Period}} = \frac{365}{86} = 4.244$$

(iii) Amount of Working Capital Required

$$= \frac{\text{Annual Operating Cost}}{\text{Number of Operating Cycles}} = \frac{\text{₹ 9,50,000}}{4.244} = \text{₹ 2, 23,845.42}$$

10. (a) "The profit maximisation is not an operationally feasible criterion." This statement is true because Profit maximisation can be a short-term objective for any organisation and cannot be its sole objective. Profit maximization fails to serve as an operational criterion for maximizing the owner's economic welfare. It fails to provide an operationally feasible measure for ranking alternative courses of action in terms of their economic efficiency. It suffers from the following limitations:

- (i) **Vague term:** The definition of the term profit is ambiguous. Does it mean short term or long term profit? Does it refer to profit before or after tax? Total profit or profit per share?
- (ii) **Timing of Return:** The profit maximization objective does not make distinction between returns received in different time periods. It gives no consideration to the time value of money, and values benefits received today and benefits received after a period as the same.
- (iii) It ignores the risk factor.
- (iv) The term maximization is also vague

(b) (i) **Bridge Finance:** Bridge finance refers, normally, to loans taken by the business, usually from commercial banks for a short period, pending disbursement of term loans by financial institutions. Normally it takes time for the financial institution to finalise procedures of creation of security, tie-up participation with other institutions etc. even though a positive appraisal of the project has been made. However, once the loans are approved in principle, firms in order not to lose further time in starting their projects arrange for bridge finance. Such temporary loan is normally repaid out of the proceeds of the principal term loans. It is secured by hypothecation of moveable assets, personal guarantees and demand promissory notes. Generally rate of interest on bridge finance is higher as compared with that on term loans.

(ii) **Floating Rate Bonds:** These are the bonds where the interest rate is not fixed and is allowed to float depending upon the market conditions. These are ideal instruments which can be resorted to by the issuers to hedge themselves against the volatility in the interest rates. They have become more popular as a money market instrument and have been successfully issued by financial institutions like IDBI, ICICI etc.

- (iii) **Packing Credit:** Packing credit is an advance made available by banks to an exporter. Any exporter, having at hand a firm export order placed with him by his foreign buyer on an irrevocable letter of credit opened in his favour, can approach a bank for availing of packing credit. An advance so taken by an exporter is required to be liquidated within 180 days from the date of its commencement by negotiation of export bills or receipt of export proceeds in an approved manner. Thus Packing Credit is essentially a short-term advance.
- (c) On one hand when cost of 'fixed cost fund' is less than the return on investment financial leverage will help to increase return on equity and EPS. The firm will also benefit from the saving of tax on interest on debts etc. However, when cost of debt will be more than the return it will affect return of equity and EPS unfavourably and as a result firm can be under financial distress. This is why financial leverage is known as "double edged sword".

Effect on EPS and ROE:

When	Effect	Result
ROI > Interest	Favourable	Advantage
ROI < Interest	Unfavourable	Disadvantage
ROI = Interest	Neutral	Neither advantage nor disadvantage

PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I: COST ACCOUNTING

QUESTIONS

Material

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

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

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

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

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

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

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

[Take 364 days for a year]

Labour

2. Corrs Consultancy Ltd. is engaged in BPO industry. One of its trainee executives in the Personnel department has calculated labour turnover rate 24.92% for the last year using Flux method.

Following is the some data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Data Processors	540	1,080	60	1,560
Payroll Processors	?	20	60	40
Supervisors	?	60	---	?

Voice Agents	?	20	20	?
Assistant Managers	?	20	---	30
Senior Voice Agents	4	---	---	12
Senior Data Processors	8	---	---	34
Team Leaders	?	---	---	?
Employees transferred from the Subsidiary Company				
Senior Voice Agents	---	8	---	---
Senior Data Processors	---	26	---	---
Employees transferred to the Subsidiary Company				
Team Leaders	---	---	60	---
Assistant Managers	---	---	10	---

At the beginning of the year there were total 772 employees on the payroll of the company. The opening strength of the Supervisors, Voice Agents and Assistant Managers were in the ratio of 3 : 3 : 2.

The company has decided to abandon the post of Team Leaders and consequently all the Team Leaders were transferred to the subsidiary company.

The company and its subsidiary are maintaining separate set of books of account and separate Personnel Department.

You are required to calculate:

- Labour Turnover rate using Replacement method and Separation method.
- Verify the Labour turnover rate calculated under Flux method by the trainee executive of the Corrs Consultancy Ltd.

Overheads

- The Union Ltd. has the following account balances and distribution of direct charges on 31st March, 2014.

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