PAPER – 3: COST ACCOUNTING AND FINANCIAL MANAGEMENT

PART I: COST ACCOUNTING

QUESTIONS

Material

1. Aditya Agro Ltd. produces edible oils of different varieties. The monthly demand pattern for the finished products are as follows:

Mustard oil	45,000 Litre
Soybean oil	15,000 Litre
Olive oil	3,000 Litre

To produce one litre of Mustard oil, Soybean oil and Olive oil, 5 kg. of mustards, 6 kg. of soybeans and 4.5 kg. of olives are required respectively. There is no opening and closing stock of materials.

Aditya Agro Ltd. can purchase the materials either from the farmers directly or from the wholesale market. The company can purchase any quantity of materials from the wholesale market but in case of purchase from the farmers, it has to purchase the minimum specified quantity of materials at a time. Following is the material-wise summary related with the purchase of materials:

	Wholesale Market	Farmers
Mustard:		
Minimum Quantity to be purchased	Any quantity	13,50,000 kg.
Purchase price per kg. (₹)	15.00	12.50
Central Sales Tax (CST)*	2%	---
Transportation cost per purchase (₹)	6,000	15,000
Sorting and piling cost per purchase (₹)	----	1,200
Loading cost per 50 kg. (₹)	10.00	5.00
Unloading cost per 50 kg. (₹)	2.00	2.00
Soybean:		
Minimum Quantity to be purchased	Any Quantity	2,70,000 kg.
Purchase price per kg. (₹)	11.00	9.00
Value Added Tax (VAT)**	4%	---
Transportation cost per purchase (₹)	9,000	12,000
Sorting and piling cost per purchase (₹)	---	800
Loading cost per 50 kg. (₹)	10.00	3.00
Unloading cost per 50 kg. (₹)	2.00	2.00

Olive:		
Minimum Quantity to be purchased	Any Quantity	1,62,000 kg.
Purchase price per kg. (₹)	36.00	28.00
Import duty***	---	10%
Transportation Cost per purchase (₹)	3,000	11,000
Sorting and piling cost per purchase (₹)	1,800	---
Loading cost per 50 kg. (₹)	10.00	25.00
Unloading cost per 50 kg. (₹)	2.00	2.00

The company is paying 12.5% p.a. as interest to its bank for cash credit facility and ₹100 per 100 kg. as rent to the warehouse.

[*CST will be added with the purchase price of mustards; **VAT will not be added with the purchase price of soybeans; ***Import duty will be added with the purchase price of olives.]

You are required to

(i) Calculate the purchase cost of each material

  (a) from Wholesale market

  (b) from the Farmers

(ii) Calculate Economic Order Quantity of each material under the both options.

(iii) Recommend the best purchase option for the material 'olive'.

Labour

2. Jigyasa Boutiques LLP. (JBL) takes contract on job works basis. It works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 2 hours for boutique work on a piece of garment. In the month of March 2014, two workers Margaret and Jennifer were given 30 pieces and 42 pieces of garments respectively for boutique work. The following are the details of their work:

	Margaret	Jennifer
Work assigned	30 pcs.	42 pcs.
Time taken	28 hours	40 hours

Workers are paid bonus as per Halsey System. The existing rate of wages is ₹ 50 per hour. As per the new wages agreement the workers will be paid ₹ 55 per hour w.e.f. 1st April 2014. At the end of the month March 2014, the accountant of the company has calculated wages to these two workers taking ₹ 55 per hour.

(i) From the above information calculate the amount of loss that the company has incurred due to incorrect rate selection.

(ii) What would be the loss incurred by the JBL due to incorrect rate selection if it had followed Rowan scheme of bonus payment.

(iii) Amount that could have been saved if Rowan scheme of bonus payment was followed.

(iv) Do you think Rowan scheme of bonus payment is suitable for JBL?

Overheads

3. Vision Ltd. manufactures luggage trolleys for airports. The factory, in which the company undertakes all of its production, has two production departments- 'Fabrication' and 'Assembly', and two service departments- 'Stores' and 'Maintenance'.

The following information have been extracted from the company's budget for the financial year ended 31st March, 2014:

Allocated Overhead Costs	₹
Fabrication Department	15,52,000
Assembly Department	7,44,000
Stores Department	2,36,000
Maintenance Department	1,96,000
Other Overheads	₹
Factory rent	15,28,000
Factory building insurance	1,72,000
Plant & machinery insurance	1,96,000
Plant & Machinery Depreciation	2,65,000
Subsidy for staffs' canteen	4,48,000

Direct Costs	₹	₹
Fabrication Department:		
Material	63,26,000	
Labour	8,62,000	71,88,000
Assembly Department:		
Material	1,42,000	
Labour	13,06,000	14,48,000

The following additional information is also provided:

	Fabrication Department	Assembly Department	Stores Department	Maintenance Department
Floor area (square meters)	24,000	10,000	2,500	3,500
Value of plant & machinery (₹)	16,50,000	7,50,000	75,000	1,75,000
No. of stores requisitions	3,600	1,400	---	---
Maintenance hours required	2,800	2,300	400	---

No. of employees	120	80	38	12
Machine hours	30,00,000	60,000		
Labour hours	70,000	26,00,000		

Required:

(a) Prepare a table showing the distribution of overhead costs of the two service departments to the two production departments using step method; and

(b) Calculate the most appropriate overhead recovery rate for each department.

(c) Using the rates calculated in part (b) above, calculate the full production costs of the following job order:

Job number IGI2014

Direct Materials	₹ 1,15,200
Direct Labour:	
Fabrication Department	240 hours @ ₹ 18 per hour
Assembly Department	180 hours @ ₹ 18 per hour
Machine hours required:	
Fabrication Department	210 hours
Assembly Department	150 hours

Operating Costing

4. Gopal Milk Co-Operative Society (GMCS) collects raw milk from the farmers of Ramgarh, Pratapgarh and Devgarh panchayats and processes these milk to make various dairy products. GMCS has its own vehicles (tankers) to collect and bring the milk to the processing plant. Vehicles are parked in the GMCS's garage situated within the plant compound. Following are the some information related with the vehicles:

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles assigned	4	3	5
No. of trips a day	3	2	2
One way distance from the processing plant	24 k.m.	34 k.m.	16 k.m.
Toll tax paid p.m. (₹)	2,850	3,020	---

All the 5 vehicles assigned to Devgarh panchayat, were purchased five years back at a cost of ₹ 9,25,000 each. The 4 vehicles assigned to Ramgarh panchayat, were purchased two years back at a cost of ₹ 11,02,000 each and the remaining vehicles assigned to Pratapgarh were purchased last year at a cost of ₹ 13,12,000 each. With the purchase of each vehicle a two years free servicing warranty is provided. A vehicle gives 10 kmpl mileage in the first two year of purchase, 8 kmpl in next two years and 6 kmpl afterwards. The vehicles are subject to depreciation of 10% p.a. on straight line basis irrespective of usage. A vehicle has the capacity to carry 25,000 litres of milk but on an average only 70% of the total capacity is utilized.

The following expenditure is related with the vehicles:

Salary to a Driver (a driver for each vehicle)	₹ 18,000 p.m.
Salary to a Cleaner (a cleaner for each vehicle)	₹ 11,000 p.m.
Allocated garage parking fee	₹ 1,350 per vehicle per month
Servicing cost	₹ 3,000 for every complete 5,000 k.m. run.
Price of diesel per litre	₹ 58.00

From the above information you are required to calculate

(i) Total operating cost per month for each vehicle. (Take 30 days for the month)

(ii) Vehicle operating cost per litre of milk.

Job Costing

5. Ares Plumbing and Fitting Ltd. (APFL) deals in plumbing materials and also provides plumbing services to its customers. On 12th August, 2014, APFL received a job order for a students' hostel to supply and fitting of plumbing materials. The work is to be done on the basis of specification provided by the hostel owner. Hostel will be inaugurated on 5th September, 2014 and the work is to be completed by 3rd September, 2014. Following are the details related with the job work:

Direct Materials

APFL uses weighted average method for the pricing of materials issues.

Opening stock of materials as on 12th August 2014:

- 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 2014:

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

On 18th August 2014:

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

On 27th August 2014:

- 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 2014:

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

On 17th August 2014:

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

On 28th August 2014:

- 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:

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

Direct Labour:

Plumber: 180 hours @ ₹ 50 per hour (includes 12 hours overtime)

Helper: 192 hours @ ₹35 per hour (includes 24 hours overtime)

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

Overheads:

Overheads are applied @ ₹ 13 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

Joint Products & By Products

6. Oleum Refinery Ltd. refines crude oil and produces two joint product Gasoline and HSD in the ratio of 4:6. The refining is done in three processes.

Crude oil is first fed in Process-A, from where the two products Gasoline and HSD are get separated. After separation from Process-A, Gasoline and HSD are further processed in Process- B and Process- C respectively. During the month of July, 2014, 4,50,000 Ltr. of crude oil were processed in Process-A at a total cost of ₹ 1,71,99,775.

In Process-B, Gasoline is further processed at a cost of ₹ 10,80,000.

In Process- C, HSD is further processed at a cost of ₹ 1,35,000.

The Input output ratio for the each process is as follows:

Process- A 1 : 0.80

Process- B 1 : 0.95

Process- C 1 : 0.90

The details of sales during the month are:

	Gasoline	HSD
Quantity sold (Ltr.)	1,32,000	1,88,000
Sales price per Ltr.(₹)	68	46

There were no opening stocks. If these products were sold at split-off point, the selling price of Gasoline and HSD would be ₹ 64 and ₹ 41 per Ltr. respectively.

Required:

(i) Prepare a statement showing the apportionment of joint cost to Gasoline and HSD in proportion of sales value at split off point.

(ii) Prepare a statement showing the cost per Ltr. of each product indicating joint cost, processing cost and total cost separately.

(iii) Prepare a statement showing the product wise profit or loss for the month.

Standard Costing

7. The standard material cost for a normal mix of one tonne of product "Captain" based on:

Raw Material	Usage (in tonne)	Price per tonne
A	0.740	₹ 12,000
B	0.400	₹ 23,500
C	0.640	₹ 18,000

During the month of July, 2014, 18 tonnes of product "Captain" were produced from:

Raw Material	Consumption (tonnes)	Cost (₹)
A	13.12	1,62,000
B	7.10	1,65,200
C	11.50	2,07,000

Required to Calculate:

(i) Material Cost Variance

(ii) Material Price Variance

(iii) Material Usage Variance

(iv) Material Mix Variance

(v) Material Yield Variance

Marginal Costing

8. Maxim Ltd. manufactures a product "N-joy". In the month of August 2014, 14,000 units of the product "N-joy" were sold, the details are as under:

	(₹)
Sale Revenue	2,52,000
Direct Material	1,12,000
Direct Labour	49,000
Variable Overheads	35,000
Fixed Overheads	28,000

A forecast for the month of September 2014 has been carried out by the General manger of Maxim Ltd. As per the forecast, price of direct material and variable overhead will be increased by 10% and 5% respectively.

Required to calculate:

(i) Number of units to be sold to maintain the same quantum of profit that made in August 2014.

(ii) Margin of safety in the month of August 2014 and September 2014.

Budget and Budgetary Control

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

Month	No. of vehicles
October	4,000
November	3,500
December	4,500
January	6,000
February	6,500

To manufacture a vehicle, a standard cost of ₹ 2,85,700 is incurred and sold through dealers at an uniform selling price of ₹ 3,95,600 to customers. Dealers are paid 12.5% commission on selling price on sale of a vehicle.

Apart from other materials four units of Part-X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part-X at the end of the each month to cover 40% of next month's production. 4,800 units of Part-X are in stock as on 1st October.

There are 950 nos. of completed vehicles are in stock as on 1st October and it is policy to have stocks at the end of each month to cover 20% of the next month's sales.

You are required to

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

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

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

Miscellaneous

10. (a) What is Cost accounting? Enumerate its important objectives.

(b) What are the reasons for disagreement of profits as per cost accounts and financial accounts? Discuss.

(c) What is cost plus contract? State its advantages.

(d) What is inter-process profit? State its advantages and disadvantages.

SUGGESTED HINTS/ANSWERS

1. (i) Calculation of Purchase Cost per Kg. of Materials

	Wholesale Market (₹)	Farmers (₹)
Mustard:		
Purchase price	15.00	12.50
Add: Central Sales Tax @ 2%	0.30	---
Add: Loading Cost	0.20	0.10
	(₹ 10 ÷ 50 Kg.)	(₹ 5 ÷ 50 Kg.)
Add: Unloading Cost	0.04	0.04
	(₹ 2 ÷ 50 Kg.)	(₹ 2 ÷ 50 Kg.)
	15.54	12.64
Soybean:		
Purchase price	11.00	9.00
Add: Loading Cost	0.20	0.06
	(₹ 10 ÷ 50 Kg.)	(₹ 3 ÷ 50 Kg.)
Add: Unloading Cost	0.04	0.04
	(₹ 2 ÷ 50 Kg.)	(₹ 2 ÷ 50 Kg.)
	11.24	9.10
Olive:		
Purchase price	36.00	28.00
Add: Import duty @ 10%	---	2.80
Add: Loading Cost	0.20	0.50
	(₹ 10 ÷ 50 Kg.)	(₹ 25 ÷ 50 Kg.)

Add: Unloading Cost	0.04 (₹ 2 ÷ 50 Kg.)	0.04 (₹ 2 ÷ 50 Kg.)
	36.24	31.34

(ii) Economic Order Quantity (E.O.Q) = $\sqrt{\frac{2 \times \text{Annual requirement} \times \text{Ordering cost}}{\text{Carrying cost per kg. per annum}}}$

Annual Requirement (A) :

Commodity		Quantity (Kg.)
Mustard	(45,000 Ltr. × 5 Kg. × 12 months)	27,00,000
Soybean	(15,000 Ltr. × 6 Kg. × 12 months)	10,80,000
Olive	(3,000 Ltr. × 4.5 Kg. × 12 months)	1,62,000

Cost per Order (O):

	Wholesale Market (₹)	Farmers (₹)
Mustard:		
- Transportation cost	6,000	15,000
- Sorting and piling cost	---	1,200
	6,000	16,200
Soybean:		
- Transportation cost	9,000	12,000
- Sorting and piling cost	---	800
	9,000	12,800
Olive:		
- Transportation cost	3,000	11,000
- Sorting and piling cost	1,800	---
	4,800	11,000

Carrying Cost per Kg. per annum (C × i):

	Wholesale Market (₹)	Farmers (₹)
Mustard:		
- Interest on cash credit	1.9425 (₹ 15.54 × 12.5%)	1.5800 (₹ 12.64 × 12.5%)
- Warehouse rent*	1.0000	1.0000
	2.9425	2.5800

Soybean:		
- Interest on cash credit	1.4050 (₹ 11.24 × 12.5%)	1.1375 (₹ 9.10 × 12.5%)
- Warehouse rent	1.0000	1.0000
	2.4050	2.1375
Olive:		
- Interest on cash credit	4.5300 (₹ 36.24 × 12.5%)	3.9175 (₹ 31.34 × 12.5%)
- Warehouse rent	1.0000	1.0000
	5.5300	4.9175

* Warehouse rent per Kg. = $\frac{₹100}{100 Kg.}$ = ₹ 1

Calculation of E.O.Q for each material under the both options

	Wholesale Market (Kg.)	Farmers (Kg.)
Mustard	$\sqrt{\frac{2\times 27,00,000 Kg.\times ₹6,000}{₹2.9425}}$ = 1,04,933.53	$\sqrt{\frac{2\times 27,00,000 Kg.\times ₹16,200}{₹2.5800}}$ = 1,84,138.47
Soybean	$\sqrt{\frac{2\times 10,80,000 Kg.\times ₹9,000}{₹2.4050}}$ = 89,906.40	$\sqrt{\frac{2\times 10,80,000 Kg.\times ₹12,800}{₹2.1375}}$ = 1,13,730.98
Olive	$\sqrt{\frac{2\times 1,62,000 Kg.\times ₹4,800}{₹5.5300}}$ = 16,769.90	$\sqrt{\frac{2\times 1,62,000 Kg.\times ₹11,000}{₹4.9175}}$ = 26,921.34

(iii) Selection of best purchase option for the purchase of Olives

	Wholesale Market	Farmers
Annual Requirement (A) (Kg.)	1,62,000	1,62,000
Order Quantity (Q)	16,769.90	1,62,000
No. of orders $\left(\frac{A}{Q}\right)$	9.66 or 10	1
Average Inventory $\left(\frac{Q}{2}\right)$ (Kg.)	8,384.95	81,000

Ordering Cost (₹)	(I)	48,000 (10 Orders × ₹ 4,800)	11,000 (1 Order × ₹ 11,000)
Carrying Cost (₹) (Average Inventory × Carrying cost per kg.)	(II)	46,368.77 (8,384.95 Kg. × ₹ 5.5300)	3,98,317.5 (81,000 Kg. × ₹ 4.9175)
Purchase Cost (₹)	(III)	58,70,880 (1,62,000 Kg. × ₹ 36.24)	50,77,080 (1,62,000 Kg. × ₹ 31.34)
Total Cost	(I) + (II) + (III)	59,65,248.77	54,86,397.50

Purchasing olives direct from the farmers is the best purchase option for the Aditya Agro Ltd.

2.

	Margaret	Jennifer
No. of garments assigned (Pieces.)	30	42
Hour allowed per piece (Hours)	2	2
Total hours allowed (Hours)	60	84
Hours Taken (Hours)	28	40
Hours Saved (Hours)	32	44

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

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

	Margaret (₹)	Jennifer (₹)	Total (₹)
Basic Wages	140 (28 Hrs. × ₹ 5)	200 (40 Hrs. × ₹ 5)	340
Bonus (as per Halsey Scheme) (50% of Time Saved × Excess Rate)	80 (50% of 32 Hrs. × ₹ 5)	110 (50% of 44 Hrs. × ₹ 5)	190
Excess Wages Paid	220	310	530

(ii) Amount of loss if Rowan scheme of bonus payment were followed

	Margaret (₹)	Jennifer (₹)	Total (₹)
Basic Wages	140.00 (28 Hrs. × ₹ 5)	200.00 (40 Hrs. × ₹ 5)	340.00

Bonus (as per Rowan Scheme) $\left(\frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Excess Rate}\right)$	74.67 $\left(\frac{28}{60} \times 32 \times ₹5\right)$	104.76 $\left(\frac{40}{84} \times 44 \times ₹5\right)$	179.43
Excess Wages Paid	214.67	304.76	519.43

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

	Margaret (₹)	Jennifer (₹)	Total (₹)
Wages paid under Halsey Scheme	220.00	310.00	530.00
Wages paid under Rowan Scheme	214.67	304.76	519.43
Difference (Savings)	5.33	5.24	10.57

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

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

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

3. (a) Table of Primary Distribution of Overheads

Particulars	Basis of Apportionment	Total Amount	Production Department		Service Departments	
			Fabrication	Assembly	Stores	Maintenance
Overheads Allocated	Allocation	27,28,000	15,52,000	7,44,000	2,36,000	1,96,000
Direct Costs	Actual	86,36,000	71,88,000	14,48,000	---	---
Other Overheads:						
Factory rent	Floor Area (48:20:5:7)	15,28,000	9,16,800	3,82,000	95,500	1,33,700
Factory building insurance	Floor Area (48:20:5:7)	1,72,000	1,03,200	43,000	10,750	15,050
Plant & Machinery insurance	Value of Plant & Machinery (66:30:3:7)	1,96,000	1,22,038	55,472	5,547	12,943
Plant & Machinery Depreciation	Value of Plant & Machinery (66:30:3:7)	2,65,000	1,65,000	75,000	7,500	17,500

Canteen Subsidy	No. of employees (60:40:19:6)	4,48,000	2,15,040	1,43,360	68,096	21,504
		1,39,73,000	1,02,62,078	28,90,832	4,23,393	3,96,697

Re-distribution of Service Departments' Expenses:

Particulars	Basis of Apportionment	Production Department		Service Departments	
		Fabrication	Assembly	Stores	Maintenance
Overheads as per Primary distribution	As per Primary distribution	1,02,62,078	28,90,832	4,23,393	3,96,697
Maintenance Department Cost	Maintenance Hours (28:23:4:-)	2,01,955	1,65,891	28,851	(3,96,697)
		1,04,64,033	30,56,723	4,52,244	---
Stores Department	No. of Stores Requisition (18:7:-:-)	3,25,616	1,26,628	(4,52,244)	
		1,07,89,649	31,83,351	---	---

(b) Overhead Recovery Rate

Department	Apportioned Overhead (₹) (I)	Basis of Overhead Recovery Rate (II)	Overhead Recovery Rate (₹) [(I) ÷ (II)]
Fabrication	1,07,89,649	30,00,000 Machine Hours	3.60 per Machine Hour
Assembly	31,83,351	26,00,000 Labour Hours	1.22 per Labour Hour

(c) Calculation of full production costs of Job no. IGI2014.

Particulars	Amount (₹)
Direct Materials	1,15,200
Direct Labour:	
- Fabrication Deptt. (240 hours × ₹ 18)	4,320
- Assembly Deptt. (180 hours × ₹ 18)	3,240
Production Overheads:	
- Fabrication Deptt. (210 hours × ₹ 3.60)	756
- Assembly Deptt. (180 hours × ₹ 1.22)	220
Total Production Cost	1,23,736

4. (i) Calculation of Operating Cost per month for each vehicle

	Ramgarh	Pratapgarh	Devgarh	Total
A. Running Costs:				
- Cost of diesel (Working Note- 2)	1,25,280	70,992	92,800	2,89,072
- Servicing cost (Working Note- 3)	9,000	---	3,000	12,000
	1,34,280	70,992	95,800	3,01,072
B. Fixed Costs:				
- Salary to drivers	72,000 (4 drivers × ₹ 18,000)	54,000 (3 drivers × ₹ 18,000)	90,000 (5 drivers × ₹ 18,000)	2,16,000
- Salary to cleaners	44,000 (4 cleaners × ₹ 11,000)	33,000 (3 cleaners × ₹ 11,000)	55,000 (5 cleaners × ₹ 11,000)	1,32,000
- Allocated garage parking fee	5,400 (4 vehicles × ₹ 1,350)	4,050 (3 vehicles × ₹ 1,350)	6,750 (5 vehicles × ₹ 1,350)	16,200
- Depreciation (Working Note- 4)	36,733	32,800	38,542	1,08,075
- Toll tax passes	2,850	3,020	---	5,870
	1,60,983	1,26,870	1,90,292	4,78,145
Total [A + B]	2,95,263	1,97,862	2,86,092	7,79,217
Operating Cost per vehicle	73,815.75 (₹ 2,95,263 ÷ 4 vehicles)	65,954 (₹ 1,97,862 ÷ 3 vehicles)	57,218.40 (₹ 2,86,092 ÷ 5 vehicles)	64,934.75 (₹ 7,79,217 ÷ 12 vehicles)

(ii) Vehicle operating cost per litre of milk

$$\frac{\text{Total Operating Cost per month}}{\text{Total milk carried a month}} = \frac{₹7,79,217}{1,47,00,000 \text{ Litres (Working Note} - 5)} = ₹\ 0.053$$

Working Notes:

1. Distance covered by the vehicles in a month

Route		Total Distance (in K.M.)
Ramgarh	(4 vehicles × 3 trips × 2 × 24 km. × 30 days)	17,280
Pratapgarh	(3 vehicles × 2 trips × 2 × 34 km. × 30 days)	12,240
Devgarh	(5 vehicles × 2 trips × 2 × 16 km. × 30 days)	9,600

2. Cost of diesel consumption

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	9,600
Mileage per litre of diesel	8 kmpl	10 kmpl	6 kmpl
Diesel consumption (Litre)	2,160 (17,280 ÷ 8)	1,224 (12,240 ÷ 10)	1,600 (9,600 ÷ 6)
Cost of diesel consumption @ ₹ 58 per litre (₹)	1,25,280	70,992	92,800

3. Servicing Cost

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	9,600
Covered under free service warranty	No	Yes	No
No. of services required	3 (17,280 k.m. ÷ 5,000 k.m.)	2 (12,240 k.m. ÷ 5,000 k.m.)	1 (9,600 k.m. ÷ 5,000 k.m.)
Total Service Cost (₹)	9,000 (₹ 3,000 × 3)	---	3,000 (₹ 3,000 × 1)

4. Calculation of Depreciation

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles	4	3	5
Cost of a vehicle	11,02,000	13,12,000	9,25,000
Total Cost of vehicles	44,08,000	39,36,000	46,25,000
Depreciation per month	36,733 $\left(\frac{₹44,08,000 \times 10\%}{12 \text{ months}}\right)$	32,800 $\left(\frac{₹39,36,000 \times 10\%}{12 \text{ months}}\right)$	38,542 $\left(\frac{₹46,25,000 \times 10\%}{12 \text{ months}}\right)$

5. Total volume of Milk Carried

Route		Milk Qty. (Litre)
Ramgarh	(25,000 ltr. × 0.7 × 4 vehicles × 3 trips × 30 days)	63,00,000
Pratapgarh	(25,000 ltr. × 0.7 × 3 vehicles × 2 trips × 30 days)	31,50,000
Devgarh	(25,000 ltr. × 0.7 × 5 vehicles × 2 trips × 30 days)	52,50,000
		1,47,00,000

5. (a) Calculation of Total Cost for the Hostel 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 × ₹ 50) + (12 hours × ₹ 25)]	9,300.00	
- Helper [(192 hours × ₹ 35) + (24 hours × ₹ 17.5)]	7,140.00	16,440.00
- Overheads [₹ 13 × (180 + 192) hours]		4,836.00
Total Cost		44,367.95

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

	Amount (₹)
Total Cost incurred on the job	44,367.95
Add: 25% Profit on Job Price $\left(\frac{44,367.95}{75\%}\times 25\%\right)$	14,789.32
	59,157.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (₹)
17-08-2014	8 units × ₹ 600	4,800.00
28-08-2014	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 (₹)
12-08-2014	2 units × ₹ 660	1,320.00
28-08-2014	$2 \text{ units} \times \left(\frac{8 \times ₹660 + 30 \times ₹610 + 20 \times ₹660}{58 \text{ units}}\right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (₹)
12-08-2014	18 units × ₹ 26	468.00
17-08-2014	30 units × ₹ 26	780.00
28-08-2014	$34 \text{ units} \times \left(\frac{12 \times ₹26 + 150 \times ₹28}{162 \text{ units}}\right)$	946.96
30-08-2014	$60 \text{ units} \times \left(\frac{12 \times ₹26 + 150 \times ₹28}{162 \text{ units}}\right)$	1,671.11
		3,866.07

6. Calculation of quantity produced

	Process- A (Ltr.)	Process- B (Ltr.)	Process- C (Ltr.)
Input	4,50,000	1,44,000	2,16,000
Normal Loss	(90,000)	(7,200)	(21,600)
	(20% of 4,50,000 ltr.)	(5% of 1,44,000 ltr.)	(10% of 2,16,000 ltr.)
	3,60,000	1,36,800	1,94,400
Production of Gasoline	1,44,000	136,800	--
Production of HSD	2,16,000	--	1,94,400

(i) Statement of apportionment of joint cost on the basis of sale value at split-off point

	Gasoline	HSD
Output at split-off point (Ltr.)	1,44,000	2,16,000
Selling price per Ltr. (₹)	64	41
Sales value (₹)	92,16,000	88,56,000
Share in Joint cost (128:123)	87,71,200	84,28,575
	$\left(\frac{₹1,71,99,775}{251} \times 128\right)$	$\left(\frac{₹1,71,99,775}{251} \times 123\right)$

(ii) Statement of cost per Litre.

	Gasoline	HSD
Output (Ltr.)	1,36,800	1,94,400
Share in joint cost (₹)	87,71,200	84,28,575
Cost per Ltr. (₹) (Joint cost)	64.11	43.36
Further processing cost (₹)	10,80,000	1,35,000
Further processing cost per Ltr. (₹)	7.89	0.69
Total cost per Ltr. (₹)	72.00	44.05

(iii) Statement of profit

	Gasoline	HSD
Output (Ltr.)	1,36,800	1,94,400
Sales (Ltr.)	1,32,000	1,88,000
Closing stock (Ltr.)	4,800	6,400
	(₹)	**(₹)**
Sales @ ₹68 and ₹46 for Gasoline and HSD respectively	89,76,000	86,48,000
Add: closing stock (Ltr.) (at full cost)	3,45,600	2,81,920
Value of production	93,21,600	89,29,920
Less: Share in joint cost	87,71,200	84,28,575
Further processing	10,80,000	1,35,000
Profit/ (Loss)	(5,29,600)	3,66,345

7. (i) Material Cost Variance = Standard Cost – Actual Cost

Or = SP × SQ – AP × AQ

A = (₹ 12,000 × 18 tonne × 0.74) – ₹ 1,62,000 = ₹ 2,160 (A)

B = (₹ 23,500 × 18 tonne × 0.40) – ₹ 1,65,200 = ₹ 4,000 (F)

C = (₹ 18,000 × 18 tonne × 0.64) – ₹ 2,07,000 = ₹ 360 (F)

= ₹ 2,200 (F)

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

Or = AQ × SP – AQ × AP

A = (13.12 tonne × ₹ 12,000) – ₹ 1,62,000

= ₹ 1,57,440 - ₹ 1,62,000 = ₹ 4,560 (A)

B = (7.1 tonne × ₹ 23,500) – ₹ 1,65,200

= ₹ 1,66,850 - ₹ 1,65,200 = ₹ 1,650 (F)

C = (11.5 tonne × ₹ 18,000) – ₹ 2,07,000

= ₹ 2,07,000 - ₹ 2,07,000 = Nil

= ₹ 2,910 (A)

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

Or = SP × SQ – SP × AQ

A = (₹12,000 × 18 tonne × 0.74) – (₹ 12,000 × 13.12 tonne)

= ₹ 1,59,840 – ₹ 1,57,440 = ₹ 2,400 (F)

B = (₹23,500 × 18 tonne × 0.40) – (₹ 23,500 × 7.10 tonne)

= ₹ 1,69,200 – ₹ 1,66,850 = ₹ 2,350 (F)

C = (₹18,000 × 18 tonne × 0.64) – (₹ 18,000 × 11.5 tonne)

= ₹ 2,07,360 – ₹ 2,07,000 = ₹ 360 (F)

= ₹ 5,110 (F)

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

Or = SP × RSQ – SP × AQ

A = $\left(₹12,000 \times 31.72 \text{ tonne} \times \frac{0.74}{1.78}\right)$ – (₹ 12,000 × 13.12 tonne)

= ₹1,58,243.6 – ₹1,57,440 = ₹ 803.60 (F)

B = $\left(₹ 23,500 \times 31.72 \text{ tonne} \times \frac{0.40}{1.78}\right)$ – (₹ 23,500 × 7.10 tonne)

= ₹ 1,67,510.11 – ₹1,66,850 = ₹ 660.11 (F)

C = $\left(₹18,000 \times 31.72 \text{ tonne} \times \frac{0.64}{1.78}\right)$ – (₹ 18,000 × 11.5 tonne)

= ₹ 2,05,288.99 – ₹ 2,07,000 = ₹ 1,711.01 (A)

= ₹ 2,47.30 (A)

(v) Material Yield Variance = Std. Price (Std. Quantity - Revised Std. Quantity)

Or = SP × SQ – SP × RSQ

A = (₹12,000 × 18 tonne × 0.74) - $\left(₹12,000 \times 31.72 \text{ tonne} \times \frac{0.74}{1.78}\right)$

= ₹1,59,840 - ₹1,58,243.6 = ₹ 1,596.40 (F)

B = (₹23,500 × 18 tonne × 0.40) - $\left(₹ 23,500 \times 31.72 \text{ tonne} \times \frac{0.40}{1.78}\right)$

= ₹ 1,69,200 - ₹ 1,67,510.11 = ₹ 1,689.89 (F)

C = (₹18,000 × 18 tonne × 0.64) - $\left(₹18,000 \times 31.72 \text{ tonne} \times \frac{0.64}{1.78}\right)$

= ₹ 2,07,360 - ₹ 2,05,288.99 = ₹ 2,071.01 (F)

= ₹ 5,357.30 (F)

8. Calculation of Profit made in the month of August 2014 by selling 14,000 units.

	Amount per unit (₹)	Amount (₹)
Sales Revenue	18.00	2,52,000
Less: Variable Costs:		
- Direct Material	8.00	1,12,000
- Direct Labour	3.50	49,000
- Variable Overhead	2.50	35,000
Contribution	4.00	56,000
Less: Fixed Overhead	2.00	28,000
Profit	2.00	28,000

(i) To maintain the same amount of profit i.e. ₹ 28,000 in September 2014 also, the company needs to maintain a contribution of ₹ 56,000.

Let, number of units to be sold in September 2014 is 'x', then the contribution will be

₹ 18 x – [(₹8 × 1.10) + ₹ 3.5 + (₹ 2.5 × 1.05)] x = ₹ 56,000

₹ 18 x – (₹ 8.8 + ₹ 3.5 + ₹ 2.625) x = ₹ 56,000

Or, $x = \frac{₹56,000}{₹3.075}$

= 18,211.38 units or 18,212 units.

(ii) Margin of Safety

	August 2014	September 2014
Profit	₹ 28,000	₹ 28,000
P/V Ratio	$\frac{₹4}{₹18}\times100$	$\frac{₹3.075}{₹18}\times100$
Margin of Safety $\left(\frac{\text{Profit}}{\text{P/V Ratio}}\times100\right)$	₹1,26,000 $\left(\frac{28,000}{400}\times18\times100\right)$	₹1,63,902.44 $\left(\frac{28,000}{307.5}\times18\times100\right)$

9. (a) Preparation of Production Budget (in units)

	October	November	December	January
Demand for the month (Nos.)	4,000	3,500	4,500	6,000
Add: 20% of next month's demand	700	900	1,200	1,300
Less: Opening Stock	(950)	(700)	(900)	(1,200)
Vehicles to be produced	3,750	3,700	4,800	6,100

(b) Preparation of Purchase budget for Part-X

	October	November	December
Production for the month (Nos.)	3,750	3,700	4,800
Add: 40% of next month's production	1,480 (40% of 3,700)	1,920 (40% of 4,800)	2,440 (40% of 6,100)
	5,230	5,620	7,240
No. of units required for production	20,920 (5,230 × 4 units)	22,480 (5,620 × 4 units)	28,960 (7,240 × 4 units)
Less: Opening Stock	(4,800)	(5,920) (1,480 × 4 units)	(7,680) (1,920 × 4 units)
No. of units to be purchased	16,120	16,560	21,280

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

	October	November	December	Total
Sales in nos.	4,000	3,500	4,500	12,000
Net Selling Price per unit*	₹ 3,46,150	₹ 3,46,150	₹ 3,46,150	
Sales Revenue (₹ in lakh)	13,846	12,115.25	15,576.75	41,538
Less: Cost of Sales (₹ in lakh) (Sales unit × Cost per unit)	11,428	9,999.50	12,856.50	34,284
Gross Profit (₹ in lakh)	2,418	2,115.75	2,720.25	7,254

* Net Selling price unit = ₹ 3,95,600 – 12.5% commission on ₹ 3,95,600 = ₹ 3,46,150

10. (a) Cost Accounting is defined as "the process of accounting for cost which begins with the recording of income and expenditure or the bases on which they are calculated and ends with the preparation of periodical statements and reports for ascertaining and controlling costs."

The main objectives of the cost accounting are as follows:

(a) *Ascertainment of cost*: There are two methods of ascertaining costs, viz., Post Costing and Continuous Costing. Post Costing means, analysis of actual information as recorded in financial books. Continuous Costing, aims at collecting information about cost as and when the activity takes place so that as soon as a job is completed the cost of completion would be known.

(b) *Determination of selling price*: Business enterprises run on a profit making basis. It is thus necessary that the revenue should be greater than the costs incurred. Cost accounting provides the information regarding the cost to make and sell the product or services produced.

(c) *Cost control and cost reduction*: To exercise cost control, the following steps should be observed:
   (i) Determine clearly the objective.
   (ii) Measure the actual performance.
   (iii) Investigate into the causes of failure to perform according to plan;
   (iv) Institute corrective action.

(d) *Cost Reduction* may be defined "as the achievement of real and permanent reduction in the unit cost of goods manufactured or services rendered without impairing their suitability for the use intended or diminution in the quality of the product."

(e) *Ascertaining the profit of each activity*: The profit of any activity can be ascertained by matching cost with the revenue of that activity. The purpose under this step is to determine costing profit or loss of any activity on an objective basis.

(f) *Assisting management in decision making*: Decision making is defined as a process of selecting a course of action out of two or more alternative courses. For making a choice between different courses of action, it is necessary to make a comparison of the outcomes, which may be arrived under different alternatives.

(b) Reasons for disagreement of profits as per cost and financial accounts: The various reasons for disagreement of profits shown by the two sets of books viz., cost and financial may be listed as below:

1. *Items appearing only in financial accounts:* The following items of income and expenditure are normally included in financial accounts and not in cost accounts. Their inclusion in cost accounts might lead to unwise managerial decisions. These items are:
   (i) Income:
      (a) Profit on sale of assets
      (b) Interest received
      (c) Dividend received
      (d) Rent receivable
      (e) Share Transfer fees
   (ii) Expenditure
      (a) Loss on sale of assets
      (b) Uninsured destruction of assets
      (c) Loss due to scrapping of plan and machinery
      (d) Preliminary expenses written off
      (e) Goodwill written off

(f) Underwriting commission and debenture discount written off

(g) Interest on mortgage and loans

(h) Fines and penalties

(iii) Appropriation

(a) Dividends

(b) Reserves

(c) Dividend equalization fund, Sinking fund etc.

2. *Items appearing only in cost accounts:* There are some items which are included in cost accounts but not in financial account. These are:

(d) Notional interest on capital;

(e) Notional rent on premises owned.

3. *Under or over-absorption of overhead:* In cost accounts overheads are charged to production at pre-determined rates where in financial accounts actual amount of overhead is charged, the difference gives rise under or over-absorption; causing a difference in profits.

4. *Different bases of stock valuation:* In financial books, stocks are valued at cost or market price, whichever is lower. In cost books, however, stock of materials may be valued on FIFO or LIFO basis and work-in-progress may be valued at prime cost or works cost. Differences in store valuation may thus cause a difference between the two profits.

5. *Depreciation:* The amount of depreciation charge may be different in the two sets of books either because of the different methods of calculating depreciation or the rates adopted. In company accounts, for instance, the straight line method may be adopted whereas in financial accounts it may be the diminishing balance method.

(c) Cost plus contract: Under cost plus contract, the contract price is ascertained by adding a percentage of profit to the total cost of the work. Such types of contracts are entered into when it is not possible to estimate the contract cost with reasonable accuracy due to unstable condition of material, labour services etc.

Following are the advantages of cost plus contract:

(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 contract' as he is empowered to examine the books and documents of the contractor to ascertain the veracity of the cost of contract.

(d) In some process industries the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. *The difference between cost and the transfer price is known as inter-process profits.*

The advantages and disadvantages of using inter-process profit, in the case of process type industries are as follows:

Advantages:

1. Comparison between the cost of output and its market price at the stage of completion is facilitated.
2. Each process is made to stand by itself as to the profitability.

Disadvantages:

1. The use of inter-process profits involves complication.
2. The system shows profits which are not realised because of stock not sold out.

PART II: FINANCIAL MANAGEMENT

QUESTIONS

1. Answer the following, supporting the same with reasoning/working notes:

   (a) Discuss the risk-return considerations in financing of current assets.

   (b) Alpha Limited has ₹ 10 crores bonds outstanding. Bank deposits earn 10 per cent per annum. The bonds will be redeemed after 15 years for which purpose Alpha Limited wishes to create a sinking fund. How much amount should be deposited to the sinking fund each year so that Alpha Limited would have in the sinking fund ₹ 10 crores to retire its entire issue of bonds?

   (c) The overall cost of capital can be reduced by increasing the debt portion in the capital structure. Discuss.

   (d) Determine the present value of ₹ 700 each paid at the end of each of the next six years. Assume an 8 per cent of interest.

   (e) "Liquidity ratios are particularly useful in credit analysis by banks and other suppliers of short-term loans." Comment.

Management of Working Capital

2. Beta Limited faces an interest rate of 0.5 per cent per day and its broker charges ₹ 75 for each transaction in short-term securities. The managing director has stated that the minimum cash balance that is acceptable is ₹ 2,000 and that the variance of cash flows on a daily basis is ₹ 16,000. You are required to determine the maximum level of cash Beta Limited should hold and at what point should it start to purchase or sell securities?

Investment Decisions

3. Zeta Limited wants to replace its old machine with a new automatic machine. Two models A and B are available at the same cost of ₹ 5 lakhs each. Salvage value of the old machine is ₹ 1 lakh. The utilities of the existing machine can be used if the company purchases A. Additional cost of utilities to be purchased in that case are ₹ 1 lakh. If the company purchases B then all the existing utilities will have to be replaced with new utilities costing ₹ 2 lakhs. The salvage value of the old utilities will be ₹ 0.20 lakhs. The earnings after taxation are expected to be:

	(Cash inflows of)		
Year	*A* ₹	*B* ₹	*P.V. Factor @ 15%*
1.	1,00,000	2,00,000	0.87
2.	1,50,000	2,10,000	0.76
3.	1,80,000	1,80,000	0.66

4.	2,00,000	1,70,000	0.57
5.	1,70,000	40,000	0.50
Salvage Value at the end of Year 5	50,000	60,000	

The targeted return on capital is 15%. You are required to (i) Compute, for the two machines separately, net present value, discounted payback period and desirability factor and (ii) Advice which of the machines is to be selected ?

Financing Decisions

4. Gamma Limited has the following capital structure which is considered to be optimum as on 31st March, 2014.

	₹
14% Debentures	30,000
11% Preference shares	10,000
Equity (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of ₹ 23.60. Next year dividend per share is 50% of year 2014 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	*EPS (₹)*	*Year*	*EPS ₹)*
2005	1.00	2010	1.61
2006	1.10	2011	1.77
2007	1.21	2012	1.95
2008	1.33	2013	2.15
2009	1.46	2014	2.36

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is ₹ 96.

Preference shares ₹ 9.20 (with annual dividend of ₹ 1.1 per share) were also issued. The company is in 50% tax bracket.

(a) Calculate after tax:

  (i) Cost of new debt

  (ii) Cost of new preference shares

  (iii) New equity share (consuming new equity from retained earnings)

(b) Calculate marginal cost of capital when no new shares are issued.

(c) How much needs to be spent for capital investment before issuing new shares? 50% of the 2014 earnings are available as retained earnings for the purpose of capital investment.

(d) What will the marginal cost of capital when the funds exceed the amount calculated in (c), assuming new equity is issued at ₹ 20 per share?

Financing Decisions

5. Theta Limited has a total capitalization of ₹ 10 Lakhs consisting entirely of equity shares of ₹ 50 each. It wishes to raise another ₹ 5 lakhs for expansion through one of its two possible financial plans.

(1) All equity shares of ₹ 50 each.

(2) All debentures carrying 9% interest.

The present level of EBIT is ₹ 1,40,000 and Income tax rate is 50%.

Calculate EBIT level at which earnings per share would remain the same irrespective of raising funds through equity shares or debentures.

Financial Analysis and Planning

6. From the information provided by Sai Limited, you are required to prepare a statement of changes in working capital and the fund flow statement for the year.

Balance Sheet as at 31st March 2014 (All figures in Rupees)

Assets	2013	2014	Liabilities	2013	2014
	₹	₹		₹	₹
Current Assets			*Current Liabilities*		
Cash in Hand	10,000	2,000	Sundry Creditors	3,00,000	2,00,000
Bank Balances	20,000	8,000	Provision for Taxes	10,000	15,000
Sundry Debtors	2,10,000	1,80,000	Proposed Dividend	50,000	60,000
Stock	4,00,000	4,50,000			
Total Current Assets	6,40,000	6,40,000	Total Current Liabilities	3,60,000	2,75,000
Fixed Assets					
Fixed Assets	8,00,000	11,00,000			
Less: Accumulated Depreciation	1,60,000,	2,70,000			
Total Fixed Assets	6,40,000	8,30,000			
Other Assets			*Shareholder's Funds*		
Investments	1,60,000	6,70,000	Equity Share Capital	9,80,000	17,15,000

			General Reserves	1,00,000	1,50,000
Total Other Assets	1,60,000	6,70,000	Total Shareholders' Funds	10,80,000	18,65,000
Total Assets	14,40,000	21,40,000	Total Liabilities	14,40,000	21,40,000

It is also known that machinery costing ₹1,00,000 with an accumulated depreciation of ₹ 30,000 was sold for ₹60,000.

Investment Decisions

7. Mahalaxmi Limited, manufacturer of pressure cookers, is evaluating three investment situations: (1) produce a new line of aluminum skillets, (2) expand its existing pressure cooker line to include several new sizes, and (3) develop a new, higher-quality line of pressure cookers. If only the project in question is undertaken, the expected present values and the amounts of investment required are:

Project	*Investment required*	*Present value of Future Cashflows*
	₹	₹
1	2,00,000	2,90,000
2	1,15,000	1,85,000
3	2,70,000	4,00,000

If projects 1 and 2 are jointly undertaken, there will be no economies; the investments required and present values will simply be the sum of the parts. With projects 1 and 3, economies are possible in investment because one of the machines acquired can be used in both production processes. The total investment required for projects 1 and 3 combined is ₹ 4,40,000. If projects 2 and 3 are undertaken, there are economies to be achieved in marketing and producing the products but not in investment. The expected present value of future cash flows for projects 2 and 3 is ₹ 6,20,000. If all three projects are undertaken simultaneously, the economies noted will still hold. However, a ₹ 1,25,000 extension on the plant will be necessary, a space is not available for all three projects. Which project or projects should be chosen?

Financial Analysis and Planning

8. You have been hired as an analyst for the Bank of Delhi and your team is working on an independent assessment of Meyland Limited. Meyland Limited specializes in the production of freshly imported cheese from Switzerland. Your colleague has provided you with the following data for your reference:

Ratios	2014	2013	2012	2014 Industry Average
Long-term Debt	0.45	0.40	0.35	0.35

Inventory Turnover	62.65	42.42	32.25	53.25
Depreciation/Total Assets	0.25	0.014	0.018	0.015
Days' Sales in Receivables	113	98	94	130.25
Debt to Equity	0.75	0.85	0.90	0.88
Profit Margin	0.082	0.07	0.06	0.075
Total Asset Turnover	0.54	0.65	0.70	0.40
Quick Ratio	1.028	1.03	1.029	1.031
Current Ratio	1.33	1.21	1.15	1.25
Times Interest Earned	0.9	4.375	4.45	4.65
Equity Multiplier	1.75	1.85	1.90	1.88

(a) In the annual report to the shareholders, the CEO of Meyland Limited wrote, "2012 was a good year for the company with respect to our ability to meet our short-term obligations. We had higher liquidity largely due to an increase in highly liquid current assets (cash, account receivables and short-term marketable securities)." Is the CEO correct? Explain and use only relevant information in your analysis.

(b) What can you say about Meyland Limited's asset management? Be as complete as possible given the above information, but do not use any irrelevant information.

(c) You are asked to provide the shareholders with an assessment of Meyland Limited's solvency and leverage. Be as complete as possible given the above information, but do not use any irrelevant information.

Management of Working Capital

9. Lola Limited has a present annual sales turnover of ₹ 40,00,000. The unit sale price is ₹ 20. The variable cost are ₹ 12 per unit and fixed costs amount to ₹ 5,00,000 per annum. The present credit period of one month is proposed to be extended to either 2 or 3 months whichever will be more profitable. The following additional information is available:

	On the basis of Credit Period of		
	1 month	*2 months*	*3 months*
Increase in sales by	–	10%	30%
% of Bad debts to sales	1	2	5

Fixed cost will increase by ₹ 75,000 when sales will increase by 30%. The company requires a pre-tax return on investment at 20%.

Evaluate the profitability of the proposals and recommended best credit period for Lola Limited.

10. Answer the following:

(a) Discuss Profitability Index (PI) as a tool of capital budgeting and give an illustration.

(b) Differentiate between Global Depository Receipts and American Depository Receipts

(c) Differentiate between Financial lease and Operating lease.

SUGGESTED ANSWERS / HINTS

1. (a) Risk-Return Considerations in Financing of Current Assets

The financing of current assets involves a trade off between risk and return. A firm can choose from short or long term sources of finance. Short term financing is less expensive than long term financing but at the same time, short term financing involves greater risk than long term financing.

Depending on the mix of short term and long term financing, the approach followed by a company may be referred as matching approach, conservative approach and aggressive approach.

In matching approach, long-term finance is used to finance fixed assets and permanent current assets and short term financing to finance temporary or variable current assets. Under the conservative plan, the firm finances its permanent assets and also a part of temporary current assets with long term financing and hence less risk of facing the problem of shortage of funds.

An aggressive policy is said to be followed by the firm when it uses more short term financing than warranted by the matching plan and finances a part of its permanent current assets with short term financing.

(b) Computation of Amount to be deposited in the Sinking Fund

$A = S_n/FVIFA_{i, n} = S_{15}$ = ₹10 Crore/$FVIFA_{10, 15}$ = ₹ 10 crore/31.772 = ₹ 3,14,742.54.

(c) "The overall cost of capital can be reduced by increasing the debt portion in the capital structure"

In a zero-tax environment, MM Hypothesis has proved that the overall cost of capital is independent of the amount of leverage in the capital structure. However, when companies are subject to tax, the overall cost of capital will be reduced due to the tax shield provided by debt.

(d) Computation of Present Value

Here, the present value of an annuity of ₹ 700 has to be computed. The present value factor of an annuity of Re. 1 at 8 per cent for 6 years is 4.623. Therefore, the

present value of an annuity of ₹ 700 will be: 4.623× ₹ 700 = ₹ 3,236.10.

(e) "Liquidity ratios are particularly useful in credit analysis by banks and other suppliers of short-term loans"

The given statement is true because with the help of these ratios the stakeholders can draw conclusions regarding liquidity position of a firm. The liquidity position of a firm would be satisfactory, if it is able to meet its current obligations when they become due. Inability to pay-off short-term liabilities affects its credibility as well as its credit rating. Continuous default on the part of the business leads to commercial bankruptcy. Eventually such commercial bankruptcy may lead to its sickness and dissolution. Liquidity ratios are current ratio, liquid ratio and cash to current liability ratio.

2. The following steps may be followed for solving the problem:

(a) Determining of the lower level of cash Beta Limited is to have – this has been set at ₹ 2,000.

(b) Determining of the variation in cash flows of Beta Limited – this has been found to be ₹ 16,000.

(c) Calculation of the spread of transactions:

$$\text{Spread} = 3 \times \sqrt[3]{\frac{(0.75 \times \text{Variance of cashflow} \times \text{Transaction cost})}{\text{Interest rate}}}$$

$$\text{Spread} = 3 \times \sqrt[3]{\frac{(0.75 \times 16,000 \times 75}{0.005}}$$

= ₹ 1,694

(d) Calculation of the upper limit – this is the sum of the lower limit and the spread:

Upper limit : ₹ 2,000 + ₹ 1,694 = ₹ 3,694.

(e) Securities should be sold when the return point is reached. The return point is the sum of the lower limit and a third of the spread:

Return point = ₹ 2,000 + 1/3 (1,694) = ₹ 2,565.

Thus, Beta Limited is aiming for cash holding of ₹ 2,565 (return point). Therefore, if the balance of cash reaches ₹ 3,694 Beta Limited should buy ₹ 3,694 - ₹ 2,565 = ₹ 1,129 of marketable securities; if it falls to ₹ 2,000, then ₹ 2,565 - ₹ 2,000 = ₹ 565 of securities should be sold.

3. (i) Expenditure at year zero

(₹ in lakhs)

Particulars	*A*	*B*
Cost of Machine	5.00	5.00
Cost of Utilities	1.00	2.00
Salvage Value of Old Machine	(1.00)	(1.00)
Salvage Value of Old Utilities	–	(0.20)
Total Expenditure (Net)	5.00	5.80

(a) Discounted Value of Cash inflows *(₹ in lakhs)*

		Machine A		*Machine B*	
Year	*NPV Factor @ 15%*	*Cash inflows*	*Discounted Value of inflows*	*Cash flows*	*Discounted Value of inflows*
0	1.00	(5.00)	(5.00)	(5.80)	(5.80)
1	0.87	1.00	0.87	2.00	1.74
2	0.76	1.50	1.14	2.10	1.60
3	0.66	1.80	1.19	1.80	1.19
4	0.57	2.00	1.14	1.70	0.97
5	0.50	1.70	0.85	0.40	0.20
Salvage	0.50	0.50	0.25	0.60	0.30
Present Value			5.44		6.00
Net Present Value			0.44		0.20

(b) Discounted Payback Period *(₹ in lakhs)*

	Machine A		*Machine B*	
Year	*Discounted Cash inflows*	*Cumulative Discounted Cash inflows*	*Discounted Cash inflows*	*Cumulative Discounted Cash inflows*
0	(5.00)	—	(5.80)	—
1	0.87	0.87	1.74	1.74
2	1.14	2.01	1.60	3.34
3	1.19	3.20	1.19	4.53
4	1.14	4.34	0.97	5.50
5	1.10*	5.44	0.50*	6.00

* Includes salvage value

Discounted Payback Period (For A and B):

4 years + $\left(\frac{(0.66)}{1.10}\right)$ × 1 = 4.6 years 4 years + $\left(\frac{(0.30)}{0.50}\right)$ × 1 = 4.6 years

(c) Desirability Index

Profitability Index: $\frac{\text{Sum of present value of net cash inflow}}{\text{Initial cash outlay}}$

$\frac{₹\ 5.44\ \text{lakhs}}{₹\ 5.00\ \text{lakhs}}$ = 1.088 (A) $\frac{₹\ 6.00\ \text{lakhs}}{₹\ 5.80\ \text{lakhs}}$ = 1.034 (B)

(ii) Advise: The discounted payback period in both the cases is same, also the net present value is positive in both the cases but the desirability factor (profitability index) is higher in the case of Machine A, it is therefore better to choose Machine A.

4. (a) (i) Cost of New Debt

$$K_d = \frac{I(1-t)}{N}$$

$$= \frac{16(1-0.5)}{96} = 0.0833$$

(ii) Cost of New Preference Shares

$$K_p = \frac{P}{O}$$

$$= \frac{1.1}{9.2} = 0.12$$

(iii) Cost of New Equity Shares

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

$$= \frac{1.18}{23.60} + 0.10 = 0.05 + 0.10$$

= 0.15

Calculation of D_1

D_1 = 50% of 2014 EPS = 50% of 2.36 = ₹ 1.18

(b)

Type of Capital	*Proportion*	*Specific Cost*	*Product*
(1)	*(2)*	*(3)*	*(2) × (3) = (4)*
Debt	0.15	0.0833	0.0125
Preference	0.05	0.12	0.0060
Equity	0.80	0.15	0.1200
	Marginal Cost of Capital		0.1385

(c) The company can spend the following amount:

Retained earnings = (0.50) (2.36 × 10,000) = ₹ 11,800

The ordinary equity is 80% of total capital

$$\text{Capital investment} = \frac{₹11,800}{0.80} = ₹14,750$$

(d) If the company requires funds in excess of ₹ 14,750 it will have to issue new shares.

The cost of new issue will be

$$K_e = \frac{₹1.18}{20} + 0.10 = 0.159$$

The marginal cost of capital will be

Type of Capital	*Proportion*	*Specific Cost*	*Product*
(1)	*(2)*	*(3)*	*(2) × (3) = (4)*
Debt	0.15	0.0833	0.0125
Preference	0.05	0.1200	0.0060
Equity (New)	0.80	0.1590	0.1272
			0.1457

5. Computation of Level of EBIT where EPS will be Equal for Both Alternatives

The level of EBIT where EPS will be equal under both the alternatives can be ascertained by the following equation:

$$= \frac{(X - Int_1)(1 - T)}{S_1} = \frac{(X - Int_2)(1 - T)}{S_2}$$

In Alternative 1, there will be no fixed interest liability, Equity shares= 20,000+10,000=30,000.

In Alternative 2, debentures of ₹ 5 lakhs carrying 9% interest will be used. Debentures interest will be:

$$\frac{9 \times 5,00,000}{100} = ₹\ 45,000$$

Substituting the values in the above equation:

$$\frac{(X - 0)(1 - 0.5)}{30,000} = \frac{(X - 45,000)(1 - 0.5)}{20,000}$$

or

$$X = 1,35,000$$

At EBIT level of ₹ 1,35,000 earnings per share in both cases will be equal:

Calculation of EPS

	Alternative 1	*Alternative 2*
Equity Shares (A)	30,000	20,000
Debentures	0	₹ 5,00,000
	₹	₹
EBIT	1,35,000	1,35,000
Interest	0	45,000
	1,35,000	90,000
Less: Income Tax @ 50%	67,500	45,000
Earnings after Tax (B)	67,500	45,000

$$EPS = \frac{B}{A} = 2.25$$

6. Statement of Changes in Working Capital (All figures in Rupees)

Particulars	*2013*	*2014*	*Increase in Working Capital*	*Decrease in Working Capital*
Current Assets				
Closing Stock	4,00,000	4,50,000	50,000	
Sundry Debtors	2,10,000	1,80,000		30,000
Cash in Hand	10,000	2,000		8,000
Bank Balance	20,000	8,000		12,000
Total(A)	6,40,000	6,40,000		

Current Liabilities				
Sundry Creditors	3,00,000	2,00,000	1,00,000	
Provision for Taxes	10,000	15,000		5,000
Proposed Dividends	50,000	60,000		10,000
Total(B)	3,60,000	2,75,000		
Working Capital (A)-(B)	2,80,000	3,65,000		
Increase in Working Capital	85,000			85,000
	3,65,000	3,65,000	1,50,000	1,50,000

Now, before preparing the funds from operation statement and the funds flow statement, we have to calculate the amount of depreciation charged for the year and also the amount of profit or loss on account of sale of machinery. For this, we need to prepare a machinery account in the following manner:

Machinery A/c

Particulars	₹
Balance of Fixed Assets as at 2013	8,00,000
Less: Cost of Machinery sold	1,00,000
Balance in fixed assets group after sale	7,00,000
Amount of Fixed assets as at 2014	11,00,000
Difference being additional purchase in Year	4,00,000

The written down value of the machinery is the cost minus the accumulated depreciation up to the point of sale. The sale price of the machinery, minus the written down value of the machinery sold, was ₹ 60,000 - [₹ 100,000-₹ 30,000]. Loss on sale of machinery comes to ₹ 10,000.

Based upon the same logic, we have to calculate the amount of depreciation for the year.

Depreciation A/c

Particulars	₹
Opening Balance of Accumulated Depreciation	1,60,000
Less: Accumulated depreciation of machinery sold	30,000
Balance in the accumulated depreciation account	1,30,000
Closing balance as on 2014	2,70,000
Difference being depreciation for the year	1,40,000

Funds from Operations for the Year 2014

Particulars	₹
Profit for the Year (Increase in General reserves)	50,000
Add: Depreciation	1,40,000
Non-operational activity (loss on machine)	10,000
Fund From Operations	2,00,000

Funds Flow Statement for the Year 2014

Particulars	₹
Sources	
Funds from Operation	2,00,000
Proceeds from Sale of Machinery	60,000
Proceeds from Issue of Shares	7,35,000
Total (A)	9,95,000
Applications	
Purchase of Machinery	4,00,000
Purchase of Investment	5,10,000
Increase in Working Capital	85,000
Total (B)	9,95,000

7. Computation of Net Present Value (NPV) and Advise to Mahalaxmi Limited

Project	*Investment Required*	*Present value of Future Cash Flows*	*Net Present value*
	₹	₹	₹
1	2,00,000	2,90,000	90,000
2	1,15,000	1,85,000	70,000
3	2,70,000	4,00,000	1,30,000
1 and 2	3,15,000	4,75,000	1,60,000
1 and 3	4,40,000	6,90,000	2,50,000
2 and 3	3,85,000	6,20,000	2,35,000
1, 2 and 3	6,80,000	9,10,000	2,30,000

Advise: *Projects 1 and 3 should be chosen, as they provide the highest net present value.*

8. (a) The answer should be focused on using the current and quick ratios. While the current ratio has steadily increased, it is to be noted that the liquidity has not

resulted from the most liquid assets as the CEO proposes. Instead, from the quick ratio, it is noted that the increase in liquidity is caused by an increase in inventories. For a fresh cheese company, it can be argued that inventories are relatively liquid when compared to other industries. Also, given the information, the industry-benchmark can be used to derive that the company's quick ratio is very similar to the industry level and that the current ratio is indeed slightly higher - again, this seems to come from inventories.

(b) Inventory turnover, day's sales in receivables, and the total asset turnover ratio are to be mentioned here. Inventory turnover has increased over time and is now above the industry average. This is good - especially given the fresh cheese nature of the company's industry. In 2014, it means for example that every 365/62.65 = 5.9 days the company is able to sell its inventories as opposed to the industry average of 6.9 days. Days' sales in receivables have gone down over time, but are still better than the industry average. So, while they are able to turn inventories around quickly, they seem to have more trouble collecting on these sales, although they are doing better than the industry. Finally, total asset turnover is gone down over time, but it is still higher than the industry average. It does tell us something about a potential problem in the company's long term investments, but again, they are still doing better than the industry.

(c) Solvency and leverage is captured by an analysis of the capital structure of the company and the company's ability to pay interest. Capital structure: Both the equity multiplier and the debt-to-equity ratio tell us that the company has become less levered. To get a better idea about the proportion of debt in the firm, we can turn the D/E ratio into the D/V ratio: 2014: 43%, 2013: 46%, 2012:47%, and the industry-average is 47%. So based on this, we would like to know why this is happening and whether this is good or bad. From the numbers it is hard to give a qualitative judgment beyond observing the drop in leverage. In terms of the company's ability to pay interest, 2014 looks pretty bad. However, remember that times interest earned uses EBIT as a proxy for the ability to pay for interest, while we know that we should probably consider cash flow instead of earnings. Based on a relatively large amount of depreciation in 2014 (see info), it seems that the company is doing just fine.

9. Evaluation of Profitability under different Credit Periods

(₹ in Lakhs)

	Particulars	*1 Month*	*2 Months*	*3 Months*
A.	Expected profit :			
	(a) Sales	40,00,000	44,00,000	52,00,000
	(b) Total Cost:			

	(i) Variable Cost @ ₹12	24,00,000	26,40,000	31,20,000
	(ii) Fixed Costs	5,00,000	5,00,000	5,00,000
		29,00,000	31,40,000	36,20,000
	(c) Expected Profit	11,00,000	12,60,000	15,80,000
B.	Opportunity Cost of Investment in Receivables	48,333	1,04,667	1,81,000
C.	Net Benefits [A-B]	10,51,667	11,55,333	13,99,000

Recommendation: *The credit period (i.e. 3 months) should be adopted since the net benefits under this policy are higher than those under other policies.*

Working Note

Calculation of Opportunity Cost of Investments in Receivables:

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

1 Month $= ₹\ 29,00,000 \times \frac{1}{12} \times \frac{20}{100} = ₹\ 48,333$

2 Months $= ₹\ 31,40,000 \times \frac{2}{12} \times \frac{20}{100} = ₹1,04,667$

3 Months $= ₹\ 36,20,000 \times \frac{3}{12} \times \frac{20}{100} = ₹1,81,000$

10. (a) Profitability index: In capital budgeting, there are cases when we have to compare or rank a number of proposals each involving different amount of cash flows. One of the methods of comparing/ranking such proposal is to work out what is known as profitability index (PI). It is also called benefit-cost ratio. It may be calculated as follows:

$$PI = \frac{\text{Present value of net cash inflows}}{\text{Initial cash outlay}}$$

Suppose, for example a company is considering two projects viz., A and B. The present value of net cash flows and initial outlay are as follows:

	Project A	*Project B*
	₹	₹
Present Value of Net Cash Inflows	36,000	34,000
Initial Cash Outlay	30,000	29,000

In the case of the example, Project A has profitability index of 1.20 whereas Project B's ratio is 1.17 calculated as under:

$$A = \frac{₹\ 36,000}{₹\ 30,000} = 1.20$$

$$B = \frac{₹\ 34,000}{₹\ 29,000} = 1.17$$

It may be noted that as long as the profitability index is equal to or greater than 1.00, the project is acceptable.

Alternatively, profitability index may also be calculated as under:

$$PI = \frac{\text{Sum of discounted cash inflows}}{\text{Sum of discounted cash outlfows}}.$$

(b) Differentiation between Global Depository Receipts (GDRs) and American Depository Receipts (ADRs)

Global Depository Receipts (GDRs) is a negotiable certificate denominated in US dollars, which represents a-non-US companies publicly, traded local currency equity. GDRs are created when the local currency shares of an Indian company are delivered to the depository's local custodian bank, against which depository bank issues depository receipts in US dollar.

They may be freely traded in the overseas market like any other dollar denominated security either on a foreign stock exchange or in the over the counter market of qualified institutional buyers (QIBs). By issue of GDRs, Indian companies are able to tap global equity market to raise foreign currency funds by way of equity. It has distinct advantage over debt as there is no repayment of the principal and service costs are lower.

Whereas, American Depository Receipts (ADRs) are depository receipts issued by a company in the USA and are governed by the provisions of Security and Exchange Commission of USA. As the regulations are severe, Indian Companies tap the American market through private debt placements of GDRs listed in London and Luxemburg Stock Exchanges. Apart from legal impediments, ADRs are costlier than GDR Legal fees are considerably high for US listing. Registration fee in USA is also substantial. Hence, ADRs are less popular than GDRs.

(c) Difference between Financial Lease and Operating Lease

	Financial Lease	Operating Lease
1.	The risk and reward incident to ownership are passed on the lessee. The lessor only remains	The lessee is only provided the use of the asset for a certain time. Risk incident to ownership belongs only to

	the legal owner of the asset.	the lessor.
2	The lessee bears the risk of obsolescence.	The lessee is only allowed the use of asset.
3	The lease is non-cancellable by either party under it.	The lease is kept cancellable by the lessor.
4.	The lessor does not bear the cost of repairs, maintenance or operations.	Usually, the lessor bears the cost of repairs, maintenance or operations.
5.	The lease is usually full payout.	The lease is usually non-payout.