

PAPER – 4 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

Question 1 and 6 are compulsory.

Attempt three questions out of the remaining Question Numbers 2, 3, 4 and 5 and attempt two questions from the remaining Question Nos. 7, 8 and 9.

Working notes should form part of the answer.

Question 1

- (a) PQR Ltd. manufactures four products, namely A, B, C and D using the same plant and process. The following information relates to production period October, 2007:

Product	A	B	C	D
Output in units	1440	1200	960	1008
Cost per unit:				
Direct Materials	Rs. 42	Rs. 45	Rs. 40	Rs. 48
Direct Labour	Rs. 10	Rs. 9	Rs. 7	Rs. 8
Machine hours per unit	4	3	2	1

The four products are similar and are usually produced in production runs of 48 units per batch and are sold in batches of 24 units. Currently, the production overheads are absorbed using machine hour rate. The production overheads incurred by the company for the period October, 2007 are as follows:

	Rs.
Machine department costs	
(rent, depreciation and supervision)	1,26,000
Set-up Costs	40,000
Store receiving costs	30,000
Inspection	20,000
Material handling and dispatch	5,184

During the period October, 2007, the following cost drivers are to be used for allocation of overheads cost:

Cost	Cost driver
Set-up Costs	Number of production runs (batches)
Stores receiving	Requisition raised
Inspection	Number of production runs (batches)
Material handling and dispatch	Orders executed

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It is also determined that:

- (i) Machine department costs should be apportioned among set-up, stores receiving and inspection activities in proportion of 4 : 3 : 2.
- (ii) The number of requisitions raised on stores are 50 for each product. The total number of material handling and dispatch orders executed during the period are 192 and each order being for a batch size of 24 units of product.

Required:

- (i) Calculate the total cost of each product, if all overhead costs are absorbed on machine-hour rate basis.
 - (ii) Calculate the total cost of each product using activity-based costing.
 - (iii) Comment briefly on as to how an activity-based costing might benefit PQR Ltd.
- (b) Distinguish between Cost control and Cost reduction.
- (c) Discuss the reasons for disagreement of profits as per Cost Accounting and Financial Accounting. (11 + 3 + 4 = 18 Marks)

Answer

- (a) (i) Total Overhead = Rs. 1,26,000 + 40,000 + 30,000 + 20,000 + 5,184 = Rs. 2,21,184
- Total machine hours = $1,440 \times 4 + 1,200 \times 3 + 960 \times 2 + 1,008 \times 1$
- $= 5,760 + 3,600 + 1,920 + 1,008 = 12,288.$

$$\therefore \text{Overhead recovery rate / M.H.} = \frac{2,21,184}{12,288} = \text{Rs. } 18$$

Cost Statement when overheads are absorbed on machine hours rate basis

(Traditional Costing)

Product	A	B	C	D
Output in units	1,440	1,200	960	1,008
Cost per unit:				
Direct material Rs.	42	45	40	48
Direct labour Rs.	10	9	7	8
Overhead (@ Rs.18) Rs.	$4 \times 18 = 72$	$3 \times 18 = 54$	$2 \times 18 = 36$	$1 \times 18 = 18$
Total cost per unit Rs. (Material + Labour + overhead)	124	108	83	74
Total cost Rs. (Output in units $\times$ Total cost per unit)	1,78,560	1,29,600	79,680	74,592

- (ii) (1) Machine department costs of Rs. 1,26,000 to be apportioned to set-up cost, store receiving and inspection in 4 : 3 : 2 i.e. Rs. 56,000, Rs. 42,000 and Rs. 28,000 respectively.

- (2) One production run = 48 units. Hence, the number of production runs of different products:

$$A = \frac{1,440}{48} = 30, B = \frac{1,200}{48} = 25, C = \frac{960}{48} = 20, D = \frac{1,008}{48} = 21 \text{ or total 96 runs.}$$

- (3) One batch order is of 24 units. So the number of batches of different products:

$$A = \frac{1,440}{24} = 60, B = \frac{1,200}{24} = 50, C = \frac{960}{24} = 40, D = \frac{1,008}{24} = 42 \text{ or total 192 batches.}$$

- (4) Computation of Cost driver rates

Activity	Activity Cost (Rs.)	Cost driver	Quantity	Cost driver rate
Set-up	40,000 + 56,000 = 96,000	No. of production run	96	Rs. 1,000 per production run
Store-receiving	30,000 + 42,000 = 72,000	Requisition raised	50 × 4 = 200	Rs. 360 per requisition
Inspection	20,000 + 28,000 = 48,000	No. of production run	96	Rs. 500 per production run
Material handling	5,184	Orders executed (No. of batches)	192	Rs. 27 per batch

- (5) Cost statement under Activity Based Costing:

Product	A	B	C	D
Out-put in units	1,440	1,200	960	1,008
	Rs.	Rs.	Rs.	Rs.
Material	1,440 × 42 = 60,480	1,200 × 45 = 54,000	960 × 40 = 38,400	1,008 × 48 = 48,384
Labour	1,440 × 10 = 14,400	1,200 × 9 = 10,800	960 × 7 = 6,720	1,008 × 8 = 8,064
Overhead cost:				
Set up	1,000 × 30 = 30,000	1,000 × 25 = 25,000	1,000 × 20 = 20,000	1,000 × 21 = 21,000

Store receiving	360×50 = 18,000	360×50 = 18,000	360×50 = 18,000	360×50 = 18,000
Inspection	500×30 = 15,000	500×25 = 12,500	500×20 = 10,000	500×21 = 10,500
Material handling	27×60 = 1,620	27×50 = 1,350	27×40 = 1,080	27×42 = 1,134
Total overhead cost	<u>64,620</u>	<u>56,850</u>	<u>49,080</u>	<u>50,634</u>
Total cost	1,39,500	1,21,650	94,200	1,07,082
Total cost per unit, (Total cost / Output)	96.875	101.375	98.125	106.232

(iii)

Comparison of Overhead cost differences

Overhead cost per unit under Traditional Absorption Costing system	(Rs. 18 × 4 machine hours) 72.00	(Rs. 18 × 3 machine hours) 54.00	(Rs. 18 × 2 machine hours) 36.00	(Rs. 18 × 1 machine hour) 18.00
Overhead cost under Activity Based Costing system	$\frac{64,620}{1,440} = 44.875$	$\frac{56,850}{1,200} = 47.375$	$\frac{49,080}{960} = 51.125$	$\frac{50,634}{1,008} = 50.232$
Overhead Cost difference	27.125	6.625	(15.125)	(32.232)
Overhead difference due to absorption system	-37.68% over cost	-12.27% over cost	+42.10% under cost	+179.07% under cost

Comments:

- (i) There is a wide difference between the overhead cost as traced by the two systems. ABC is a superior method of tracing overhead costs since it relates the overhead costs with activities and resources consumed rather than just the machine hours rate.
- (ii) Products A and B have been over costed under absorption costing since machine hours per unit are higher than that of products C and D.
- (b) **Distinction between Cost Control and Cost Reduction:** Cost control is operated through setting standards of targets and comparing actual performance therewith, with a view to identify deviations from standards or norms and taking corrective action in order to ensure that future performance conforms to standards or norms.

Cost reduction is a continuous process of critical cost examination, analysis and challenge of standards. Each aspect of business viz., products, process, procedures,

methods, organization, personnel, etc. is critically examined and reviewed with a view of improving efficiency and effectiveness and reducing the costs.

Cost control lacks the dynamic approach which planned cost reduction demands. In cost reduction, standards which are the basis of control are constantly challenged for improvement.

(c) Reasons for disagreement of profits as per Cost Accounting and Financial Accounting:

Items included in the financial accounts but not in Cost Accounts

(i) Appropriation of profits

- (i) Income tax
- (ii) Transfer to General Reserve
- (iii) Dividend paid
- (iv) Amount written off e.g. goodwill, preliminary expenses, debenture discount etc.

(ii) Matters of pure finance

- (i) Interest received on bank deposits/investments
- (ii) Dividends received
- (iii) Losses on sale of investment, building.
- (iv) Profit on sale of fixed assets
- (v) Transfer fees
- (vi) Damages/penalties

(iii) Items included in Cost Accounting

- (i) Opportunity cost of building owned.
- (ii) Interest on capital employed in production
- (iii) Salary of proprietor.

(iv) Under / over absorbed overheads in Cost Accounting

(v) Differences due to varying basis of valuation of inventory.

Question 2

(a) A Company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2008:

- (i) Annual demand of Alpha : 8,000 units
- (ii) Cost of placing an order : Rs. 200 per order
- (iii) Cost per unit of Alpha : Rs. 400
- (iv) Carrying cost % p.a. : 20%

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The company has been offered a quantity discount of 4% on the purchase of 'Alpha', provided the order size is 4,000 components at a time.

Required:

- (i) Compute the economic order quantity.
 - (ii) Advise whether the quantity discount offer can be accepted.
- (b) Two workers 'A' and 'B' produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to Rowan scheme while 'B' is paid bonus according to Halsey scheme. The time allowed to make the product is 50 hours. 'A' takes 30 hours while 'B' takes 40 hours to complete the product. The factory overhead rate is Rs. 5 per person-hour actually worked. The factory cost of product manufactured by 'A' is Rs. 3,490 and for product manufactured by 'B' is Rs. 3,600.

Required:

- (i) Compute the normal rate of wages.
 - (ii) Compute the material cost.
 - (iii) Prepare a statement comparing the factory cost of the product as made by two workers.
- (c) Discuss the treatment of by-product Cost in Cost Accounting. (5 + 6 + 3 = 14 Marks)

Answer

$$\begin{aligned}
 \text{(a) } EOQ &= \sqrt{\frac{2AO}{C \times i}} \\
 &= \sqrt{\frac{2 \times 8,000 \times 200}{400 \times 20\%}} \\
 &= 200 \text{ units.}
 \end{aligned}$$

Calculation of total inventory cost p.a. at EOQ.

	Rs.
Purchase cost = 8,000 × 400	32,00,000
Ordering cost $\left(\frac{A}{Q} \times O = \frac{8,000}{200} \times 200 \right) =$	8,000
Carrying cost $\left(\frac{Q}{2} \times c \times i = \frac{200}{2} \times 400 \times 20\% \right) =$	8,000
	<u>32,16,000</u>

Calculation of total inventory cost p.a. with quantity discount

	Rs.
Purchase cost = $8,000 \times (400 - 4\%)$	30,72,000
Ordering cost $\left(\frac{A}{Q} \times O = \frac{8,000}{4,000} \times 200 \right) =$	400
Carrying cost $= \left(\frac{Q}{2} \times c \times i = \frac{4,000}{2} \times 384 \times 20\% \right) =$	<u>1,53,600</u>
	<u>32,26,000</u>

Quantity discount offered should not be accepted as it results in increase in total cost of inventory management by Rs. 10,000.

- (b) Let x be the cost of material and y be the normal rate of wage/hour

	Worker A	Worker B
	Rs.	Rs.
Material cost	x	x
Labour wages	30 y	40 y
Bonus	Rowan system	Halsey system
	$\frac{\text{Time saved}}{\text{Time allowed}} \times \text{hour worked} \times \text{rate}$	Hours saved $\times 50\% \times \text{rate}$
	$= \frac{20}{50} \times 30 \times y = 12y$	$= 10 \times \frac{1}{2} \times y = 5y$
Overheads	$30 \times 5 = 150$	$40 \times 5 = 200$
Factory cost	$x + 42y + 150 = 3,490$	$x + 45y + 200 = 3,600$
	$\therefore x + 42y = 3,340 - (1)$	$\therefore x + 45y = 3,400 - (2)$

Solving (1) and (2) we get

X = 2,500 and y = 20

- (i) Normal rate of wages is Rs. 20 per hour.

- (ii) Cost of materials = Rs. 2,500.

- (iii) Comparative Statement of factory cost

	Worker A	Worker B
	Rs.	Rs.
Material cost	2,500	2,500
Wages	$30 \times 20 = 600$	$40 \times 20 = 800$

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Bonus	$\left(\frac{20}{50} \times 30 \times 20\right) = 240$	$\left(10 \times \frac{1}{2} \times 20\right) = 100$
Overheads	$30 \times 5 = 150$	$40 \times 5 = 200$
Factory cost	<u>3,490</u>	<u>3,600</u>

(c) Treatment of by-product cost in Cost Accounting:

(i) When they are of small total value, the amount realized from their sale may be dealt as follows:

- ◆ Sales value of the by-product may be credited to Profit and Loss Account and no credit be given in Cost Accounting. The credit to Profit and Loss Account here is treated either as a miscellaneous income or as additional sales revenue.
- ◆ The sale proceeds of the by product may be treated as deduction from the total costs. The sales proceeds should be deducted either from production cost or cost of sales.

(ii) When they require further processing:

In this case, the net realizable value of the by product at the split-off point may be arrived at by subtracting the further processing cost from realizable value of by products. If the value is small, it may be treated as discussed in (i) above.

Question 3

(a) RST Limited processes product Z through two distinct process – Process I and Process II. On completion, it is transferred to finished stock. From the following information for the year 2006-07, prepare Process I, Process II and Finished Stock A/c:

Particulars	Process I	Process II
Raw materials used	7,500 units	—
Raw materials cost per unit	Rs. 60	—
Transfer to next process/finished stock	7,050 units	6,525 units
Normal loss (on inputs)	5%	10%
Direct wages	Rs. 1,35,750	Rs. 1,29,250
Direct expenses	60% of direct wages	65% of direct wages
Manufacturing overheads	20% of direct wages	15% of direct wages
Realisable value of scrap per unit	Rs. 12.50	Rs. 37.50

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-progress.

- (b) Discuss the three methods of calculating labour turnover. (10 + 4 = 14 Marks)

Answer

(a)

Process I Account									
		Qty.	Rate	Amount			Qty.	Rate	Amount
To	Raw material	7,500	60	4,50,000	By	Normal Loss (5% × 7,500)	375	12.50	4,688
To	Direct wages			1,35,750	By	Abnormal Loss	75	96.79	7,260
To	Direct expenses 60% of direct wages			81,450	By	Process II Account	7,050	96.79	6,82,402
To	Manufacturing Overheads (20% of direct wages)								
				<u>27,150</u>					
		<u>7,500</u>		<u>6,94,350</u>			<u>7,500</u>		<u>6,94,350</u>

Planned output – Process I = 7,500 – 375 = 7,125 units

Actual output = 7,050 units

Abnormal loss = (7,125 units – 7,050 units) 75 units.

Cost per unit = $\frac{6,94,350 - 4,688}{7,125}$ = Rs. 96.7947. (96.80 approx.)

Process II Account									
		Qty.	Rate	Amount			Qty.	Rate	Amount
To	Process I	7,050	96.79	6,82,402	By	Normal Loss (10%)	705	37.50	26,438
To	Direct wages			1,29,250	By	Finished Stock A/c	6,525	140.05	9,13,823
To	Direct expenses 65% of direct wages			84,013					
To	Manufacturing Overheads (15% of direct wages)			<u>19,387</u>					
				<u>9,15,052</u>					
To	Abnormal gain	<u>180</u>	140.05	<u>25,209</u>			<u> </u>		<u> </u>
		7,230		9,40,261			7,230		9,40,261

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Planned output of Process II = 7,050 – 705 = 6,345 units

$$\text{Cost per unit} = \frac{9,15,052 - 26,438}{6,345} = \text{Rs. } 140.05.$$

Abnormal gain = Actual output – Planned output
 = 6,525 – 6,345
 = 180 units.

Finished Stock Account

		Qty.	Rate	Amount		Qty.	Rate	Amount
To	Process II	6,525	140.05	9,13,823	By	Sales A/c	6,000	161.06
To	Profit and Loss Account				By	Balance c/d	525	140.05
				<u>1,26,044</u>				<u>73,526</u>
		<u>6,525</u>		<u>10,39,867</u>		<u>6,525</u>		<u>10,39,867</u>

(b) Methods of calculating labour turnover

(i) Replacement method = $\frac{\text{Number of employees replaced}}{\text{Average number of employees on roll}} \times 100$

(ii) Separation method = $\frac{\text{Number of employees separated during the year}}{\text{Average number of employees on roll during the year}} \times 100$

(iii) Flux method = $\frac{\text{Number of employees separated} + \text{Number of employees replaced}}{\text{Average number of employees on roll during the year}} \times 100$

Workers joining a business concern on account of its expansion do not account for labour turnover.

Question 4

- (a) Discuss the treatment of spoilage and defectives in Cost Accounting.
 (b) Compute a conservative estimate of profit on contract (which has been 90% complete) from the following particulars:

	Rs.
Total expenditure to date	22,50,000
Estimated further expenditure to complete the contract (including contingencies)	2,50,000
Contract Price	32,50,000
Work certified	27,50,000
Work uncertified	1,75,000
Cash received	21,25,000

- (c) Discuss the various reports provided by Cost Accounting department

(4 + 6 + 4 = 14 Marks)

Answer

- (a) Treatment of spoilage and defectives in Cost Accounting: The normal spoilage cost (i.e. which is inherent in the operation) are included in cost either by charging the loss due to spoilage to production order or charging it to production overhead so that it is spread over all the products. Any value realized from sale of spoilage is credited to production order or production overhead account, as the case may be. The cost of abnormal spoilage (i.e. arising out of causes not inherent in manufacturing process) are charged to costing Profit and Loss Account.

The problem of accounting for defective work is that of accounting of the costs of rectification or rework.

The possible ways of treatment are as under:

For normal defectives:

- (i) Charge to good products.
- (ii) Charge to general overheads.
- (iii) Charge to departmental overheads
- (iv) Charge to Costing Profit and Loss Account if defectives are abnormal and due to causes beyond the control of organization.

Where defectives are easily identifiable with specific jobs, the works cost are debited to job.

- (b) The contract is 90% complete, the method used for transfer of profit to Profit and Loss Account for the current year will be on the basis of estimated profit on completed contract basis.

Credit to Profit and Loss Account = Estimated profit on completed contract

$$\times \frac{\text{Work certified}}{\text{Contract price}} \times \frac{\text{Cash received}}{\text{Work certified}}$$

Estimated profit on completed contract basis = Contract Price – (Total expenditure to date + Estimated further expenditure to completed contract)

$$= 32,50,000 - (22,50,000 + 2,50,000)$$

$$= \text{Rs. } 7,50,000.$$

$$\text{Credit to Profit and Loss Account} = 7,50,000 \times \frac{27,50,000}{32,50,000} \times \frac{21,25,000}{27,50,000} = \text{Rs. } 4,90,385$$

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- (c) The following are the various Reports provided by Cost Accounting Department:
- (i) Cost sheet setting out the total cost, analysed into various elements, giving comparative figure of previous period and other plants under the same management.
 - (ii) Consumption of material statements.
 - (iii) Labour utilization statements, details about total number of hours paid for, standard hours for output, idle time and causes thereof.
 - (iv) Overheads incurred compared with budgets.
 - (v) Reconciliation of actual profit earned with estimated or budgeted profit.
 - (vi) Total cost of abnormally spoiled work in the factory and abnormal loss and store.
 - (vii) Total cost of inventory carried, number of monthly stocks would be sufficient.
 - (viii) Labour turnover and cost of recruitment and training of new employee.
 - (ix) Expenses incurred on R & D as compared to budgeted amount.

Question 5

- (a) ABC Ltd. has three production departments P₁, P₂ and P₃ and two service departments S₁ and S₂. The following data are extracted from the records of the Company for the month of October, 2007:

	Rs.				
Rent and rates	62,500				
General lighting	7,500				
Indirect Wages	18,750				
Power	25,000				
Depreciation on machinery	50,000				
Insurance of machinery	20,000				

Other Information:

	P ₁	P ₂	P ₃	S ₁	S ₂
Direct wages (Rs.)	37,500	25,000	37,500	18,750	6,250
Horse Power of Machines used	60	30	50	10	—
Cost of machinery (Rs.)	3,00,000	4,00,000	5,00,000	25,000	25,000
Floor space (Sq. ft)	2,000	2,500	3,000	2,000	500
Number of light points	10	15	20	10	5
Production hours worked	6,225	4,050	4,100	—	—

Expenses of the service departments S_1 and S_2 are reapportioned as below:

	P_1	P_2	P_3	S_1	S_2
S_1	20%	30%	40%	—	10%
S_2	40%	20%	30%	10%	—

Required:

- Compute overhead absorption rate per production hour of each production department.
 - Determine the total cost of product X which is processed for manufacture in department P_1 , P_2 and P_3 for 5 hours, 3 hours and 4 hours respectively, given that its direct material cost is Rs. 625 and direct labour cost is Rs. 375.
- (b) Discuss the essential requisites for the installation of Uniform Costing System.

(10 + 4 = 14 Marks)

Answer

		Primary Distribution Summary					
Item of cost	Basis of apportionment	Total (Rs.)	P_1 (Rs.)	P_2 (Rs.)	P_3 (Rs.)	S_1 (Rs.)	S_2 (Rs.)
Rent and Rates	Floor area 4 : 5 : 6 : 4 : 1	62,500	12,500	15,625	18,750	12,500	3,125
General lighting	Light points 2 : 3 : 4 : 2 : 1	7,500	1,250	1,875	2,500	1,250	625
Indirect wages	Direct wages 6 : 4 : 6 : 3 : 1	18,750	5,625	3,750	5,625	2812.5	937.5
Power	Horse Power of machines used 6 : 3 : 5 : 1	25,000	10,000	5,000	8,333	1,667	—
Depreciation of machinery	Value of machinery 12 : 16 : 20 : 1 : 1	50,000	12,000	16,000	20,000	1,000	1,000
Insurance of machinery	Value of machinery 12 : 16 : 20 : 1 : 1	20,000	4,800	6,400	8,000	400	400
		<u>1,83,750</u>	<u>46,175</u>	<u>48,650</u>	<u>63,208</u>	<u>19,630</u>	<u>6,088</u>

Overheads of service cost centres Let S_1 be the overhead of service cost centre S_1 and S_2 be the overhead of service cost centre S_2 .

$$S_1 = 19,630 + 0.10 S_2$$

$$S_2 = 6,088 + 0.10 S_1$$

Substituting the value of S_2 in S_1 we get

$$S_1 = 19,630 + 0.10 (6,088 + 0.10 S_1)$$

$$S_1 = 19,630 + 608.8 + 0.01 S_1$$

$$0.99 S_1 = 20,238.8$$

$$\therefore S_1 = \text{Rs. } 20,443.$$

$$\therefore S_2 = 6,088 + 0.10 \times 20,443.$$

$$= \text{Rs. } 8,132.$$

Secondary Distribution Summary

Particulars	Total Rs.	P_1 Rs.	P_2 Rs.	P_3 Rs.
Allocated and Apportioned over-heads as per primary distribution	1,58,033	46,175	48,650	63,208
S_1	20,443	4,089	6,133	8,177
S_2	<u>8,132</u>	<u>3,253</u>	<u>1,626</u>	<u>2,440</u>
		<u>53,517</u>	<u>56,409</u>	<u>73,825</u>

Overhead rate per hour

	P_1	P_2	P_3
Total overheads cost	Rs. 53,517	Rs. 56,409	Rs. 73,825
Production hours worked	6,225	4,050	4,100
Rate per hour (Rs.)	Rs. 8.60	Rs. 13.93	Rs. 18.01

Cost of Product X

Direct material	Rs. 625
Direct labour	<u>Rs. 375</u>
Prime cost	Rs. 1,000
Production on overheads	
P_1 5 hours $\times$ Rs. 8.60 = 43	
P_2 3 hours $\times$ Rs. 13.93 = 41.79	
P_3 4 hours $\times$ Rs. 18.01 = <u>72.04</u>	<u>Rs. 156.83</u>
Factory cost	<u>Rs. 1,157</u>

- (b) Essential requisites for an installation of uniform Costing system:
- (i) The firms in the industry should be willing to share/furnish relevant data/information.
 - (ii) A spirit of cooperation and mutual trust should prevail among the participating firms.
 - (iii) Mutual exchange of ideas, methods used, special achievements made, research and know-how etc. should be frequent.
 - (iv) Bigger firms should take the lead towards sharing their experiences and know-how with the smaller firms to enable the latter to improve their performance.
 - (v) Uniformity must be established with regard to several points before the introduction of uniform costing in an industry. In fact, uniformity should be with regard to following points:
 - (a) Size of the various units covered by uniform costing.
 - (b) Production methods.
 - (c) Accounting methods, principles and procedures used.

Question 6

- (a) Consider the following mutually exclusive projects:

Projects	Cash flows (Rs.)				
	C_0	C_1	C_2	C_3	C_4
A	-10,000	6,000	2,000	2,000	12,000
B	-10,000	2,500	2,500	5,000	7,500
C	-3,500	1,500	2,500	500	5,000
D	-3,000	0	0	3,000	6,000

Required:

- (i) Calculate the payback period for each project.
- (ii) If the standard payback period is 2 years, which project will you select? Will your answer differ, if standard payback period is 3 years?
- (iii) If the cost of capital is 10%, compute the discounted payback period for each project. Which projects will you recommend, if standard discounted payback period is (i) 2 years; (ii) 3 years?
- (iv) Compute NPV of each project. Which project will you recommend on the NPV criterion? The cost of capital is 10%. What will be the appropriate choice criteria in this case? The PV factors at 10% are:

Year	1	2	3	4
PV factor at 10%	0.9091	0.8264	0.7513	0.6830
(PV/F 0.10, t)				

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(b) Consider the following information for Omega Ltd.:

	Rs. in lakhs
EBIT (Earnings before Interest and Tax)	15,750
Earnings before Tax (EBT):	7,000
Fixed Operating costs:	1,575

Required:

Calculate percentage change in earnings per share, if sales increase by 5%.

(c) Discuss Miller-Orr Cash Management Model. (10 + 3 + 3 = 16 Marks)

Answer

(a) (i) Payback Period of Projects

	C_0	C_1	C_2	C_3	
A	- 10,000 +	6,000 +	2,000 +	2,000	= 3 years
B	- 10,000 +	2,500 +	2,500 +	5,000	= 3 years
C	- 3,500 +	1,500 +	2,500		= 1 year and 9.6 months

$$\text{i.e. } \frac{12}{2,500} \times 2,000$$

D	- 3,000 +	0	+ 0	+ 3,000	= 3 years.
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(ii) If standard payback period is 2 years, Project C is the only acceptable project. But if standard payback period is 3 years, all the four projects are acceptable.

(iii) Discounted Payback Period (Cash flows discounted at 10%)

$$A \quad - 10,000 + 5,454.6 + 1,652.8 + 1,502.6 + 8,196$$

$$3 \text{ years} + \frac{12}{8,196} \times 1,390 = 3 \text{ years and 2 months}$$

$$B \quad - 10,000 + 2,272.75 + 2,066 + 3,756.5 + 5,122.50$$

$$3 \text{ years} + \frac{12}{5,122.55} \times 1,904.75 = 3 \text{ years and 4.6 months}$$

$$C \quad - 3,500 + 1,363.65 + 2,066 + 375.65 + 3,415$$

$$2 \text{ years} + \frac{12}{375.65} \times 70.35 = 2 \text{ years and 2.25 months}$$

$$D \quad - 3,000 + 0 + 0 + 2,253.9 + 4,098$$

$$3 \text{ years} + \frac{12}{4,098} \times 746.10 = 3 \text{ years and 2.18 months}$$

If standard discounted payback period is 2 years, no project is acceptable on discounted payback period criterion.

If standard discounted payback period is 3 years, Project 'C' is acceptable on discounted payback period criterion.

(iv) Evaluation of Projects on NPV criterion

$$A = -10,000 + 5,454.6 + 1,652.8 + 1,502.60 + 8,196$$

$$NPV = \text{Rs. } 6,806.2$$

$$B = -10,000 + 2,272.75 + 2,066 + 3,756.5 + 5,122.5$$

$$NPV = \text{Rs. } 3,217.75$$

$$C = -3,500 + 1,363.65 + 2,066 + 3,75.65 + 3,415$$

$$NPV = \text{Rs. } 3,720.3$$

$$D = -3,000 + 0 + 0 + 2,253.9 + 4,098$$

$$NPV = \text{Rs. } 3,351.9$$

Ranking of Projects on NPV Criterion

	NPV	Rank
	Rs.	
A	6,806.2	I
B	3,217.75	IV
C	3,720.3	II
D	3,351.9	III

Analysis: Project A is acceptable under the NPV method. The NPV technique is superior to any other technique of capital budgeting, whether it is PI or IRR. The best project is the one which adds the most, among available alternatives, to the shareholders wealth. The NPV method, by its very definition, will always select such projects. Therefore, the NPV method gives a better mutually exclusive choice than PI method. The NPV method guarantees the choice of the best alternative.

(b) Degree of Operating Leverage (DOL)

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}}$$

$$= \frac{15,750 + 1,575}{15,750} = 1.1$$

Degree of Financial Leverage (DFL)

$$= \frac{\text{EBIT}}{\text{EBT}} = \frac{15,750}{7,000} = 2.25$$

Degree of Combined Leverage (DCL)

$$= \text{DOL} \times \text{DFL}$$

$$= 1.1 \times 2.25$$

$$= 2.475$$

Percentage Change in Earnings per share

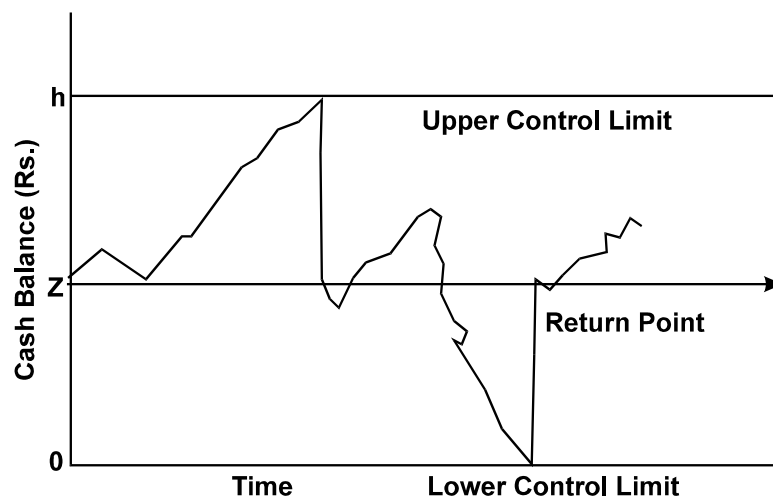
$$\text{DCL} = \frac{\% \text{ change in EPS}}{\% \text{ change in Sales}}$$

$$2.475 = \frac{\% \text{ change in EPS}}{5\%}$$

$$\therefore \% \text{ change in EPS} = 12.375\%.$$

(c) Miller Orr Cash Management Model

According to this model the net cash flow is completely stochastic. When changes in cash balance occur randomly, the application of control theory serves a useful purpose. The Miller – Orr model is one of such control limit models. This model is designed to determine the time and size of transfers between an investment account and cash account. In this model control limits are set for cash balances. These limits may consist of 'h' as upper limit, 'z' as the return point and zero as the lower limit.



MILLER-ORR CASH MANAGEMENT MODEL

When the cash balance reaches the upper limit, the transfer of cash equal to 'h – z' is invested in marketable securities account. When it touches the lower limit, a transfer

from marketable securities account to cash account is made. During the period when cash balance stays between (h, z) and (z, 0) i.e. high and low limits, no transactions between cash and marketable securities account is made. The high and low limits of cash balance are set up on the basis of fixed cost associated with the securities transaction, the opportunities cost of holding cash and degree of likely fluctuations in cash balances. These limits satisfy the demands for cash at the lowest possible total costs. The formula for calculation of the spread between the control limits is:

$$\text{Spread} = 3 \left(\frac{3/4 \times \text{Transaction Cost} \times \text{Variance of Cashflows}}{\text{Interest rate}} \right)^{1/3}$$

And, the return point can be calculated using the formula:

$$\text{Return point} = \text{Lower limit} + \frac{\text{Spread}}{3}$$

Question 7

(a) A proforma cost sheet of a Company provides the following data:

	Rs.
Raw material cost per unit	117
Direct Labour cost per unit	49
Factory overheads cost per unit (includes depreciation of Rs. 18 per unit at budgeted level of activity)	<u>98</u>
Total cost per unit	264
Profit	<u>36</u>
Selling price per unit	<u>300</u>

Following additional information is available:

Average raw material in stock	:	4 weeks
Average work-in-process stock	:	2 weeks
(% completion with respect to		
Materials	:	80%
Labour and Overheads	:	60%)
Finished goods in stock	:	3 weeks
Credit period allowed to debtors	:	6 weeks
Credit period availed from suppliers	:	8 weeks
Time lag in payment of wages	:	1 week
Time lag in payment of overheads	:	2 weeks

The company sells one-fifth of the output against cash and maintains cash balance of Rs. 2,50,000.

22 **PROFESSIONAL EDUCATION (EXAMINATION – II) : NOVEMBER, 2007**

Required:

Prepare a statement showing estimate of working capital needed to finance a budgeted activity level of 78,000 units of production. You may assume that production is carried on evenly throughout the year and wages and overheads accrue similarly.

- (b) Discuss the major considerations in Capital structure planning. (9 + 3 = 12 Marks)

Answer

(a) **Estimation of Working Capital Needs**

I	Investment in Inventory	Rs.
---	-------------------------	-----

(i)	Raw material Inventory = $78,000 \times \frac{4}{52} \times \text{Rs.}117$	7,02,000
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(ii)	Work-in-Process Inventory	
------	---------------------------	--

	Material = $78,000 \times \frac{2}{52} \times 0.80 \times 117 = 2,80,800$	
--	---	--

	Labour and Overheads Cost (other than depreciation)	
--	---	--

	$= 78,000 \times \frac{2}{52} \times 0.60 \times 129 = 2,32,200$	5,13,000
--	--	----------

(iii)	Finished Goods Inventory (Cash Cost)	
-------	--------------------------------------	--

	$= 78,000 \times \frac{3}{52} \times 246$	11,07,000
--	---	-----------

II	Investment in Debtors (Cash Cost)	
----	-----------------------------------	--

	$= 78,000 \times \frac{6}{52} \times 0.8 \times 246$	17,71,200
--	--	-----------

III	Cash Balance	
-----	--------------	--

		<u>2,50,000</u>
--	--	-----------------

	Investment in Current Assets	
--	------------------------------	--

		<u>43,43,200</u>
--	--	------------------

Current Liabilities and Deferred Payment

Rs.

(i)	Creditors = $78,000 \times \frac{8}{52} \times 117$	14,04,000
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(ii)	Wages outstanding = $78,000 \times \frac{1}{52} \times 49$	73,500
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(iii)	Overheads outstanding (cash cost) = $78,000 \times \frac{2}{52} \times 80$	<u>2,40,000</u>
-------	--	-----------------

	Total Deferred Payments	
--	-------------------------	--

		<u>17,17,500</u>
--	--	------------------

Net Working Capital (Current assets – Non-interest bearing current liabilities)

$$43,43,200 - 17,17,500 = \text{Rs. } 26,25,700$$

(b) Major Considerations in Capital Structure Planning

There are three major considerations, i.e. risk, cost of capital and control, which help the finance manager in determining the proportion in which he can raise funds from various sources.

Although these three factors determine the capital structure of a particular business undertaking at a given point of time, the finance manager attempts to design the capital structure in such a manner that his risk and costs are the least and the control of the existing management is diluted to the least extent. However, there are also subsidiary factors like marketability of the issue, maneuverability and flexibility of the capital structure and timing of raising the funds which affect the capital structure planning. Structuring capital is a shrewd financial management decision and is something which makes or mars the fortunes of the company.

As discussed earlier, the three major considerations help the finance manager in determining the proportion in which he can raise funds from various sources. Risk is of cash insolvency and of variation in the expected earnings available to the equity shareholders. Since a business should be at least capable of earning enough revenue to meet its cost of capital and finance its growth. Hence, along with risk as a factor, the finance manager has to consider the cost aspect carefully while determining the capital structure.

The other considerations which the finance manager has to keep in mind while planning for capital structure are corporate taxation, trading on equity i.e.

$$\text{ROE} = \text{ROA} + \frac{D}{E} [(\text{ROA} - V_d \times (1 - T_c))]$$
, Government policies on interest rates and lending priority sectors, legal requirements, marketability, maneuverability, flexibility, timing, dilution in EPS, BVPS and control, size of company, purpose of financing, period of finance, nature of enterprise, requirement of investors and provision for future.

Question 8

Following are the financial statements of Zed Ltd.:

Balance Sheet as on

	March 31, 2007	March 31, 2006
	Rs.	Rs.
Capital and Liabilities:		
Share capital, Rs. 10 par value	1,67,500	1,50,000
Share premium	3,35,000	2,37,500
Reserves and Surplus	1,74,300	1,23,250
Debentures	2,40,000	—

24 PROFESSIONAL EDUCATION (EXAMINATION – II) : NOVEMBER, 2007

Long-term loans	40,000	50,000
Creditors	28,800	27,100
Bank Overdraft	7,500	6,250
Accrued expenses	4,350	4,600
Income-tax payable	<u>48,250</u>	<u>16,850</u>
	<u>10,45,700</u>	<u>6,15,550</u>

	March 31, 2007	March 31, 2006
	Rs.	Rs.
Assets:		
Land	3,600	3,600
Building, net of depreciation	6,01,800	1,78,400
Machinery, net of depreciation	1,10,850	1,07,050
Investment in 'A' Ltd.	75,000	—
Stock	58,800	46,150
Prepaid expenses	1,900	2,300
Debtors	76,350	77,150
Trade Investments	40,000	1,05,000
Cash	<u>77,400</u>	<u>95,900</u>
	<u>10,45,700</u>	<u>6,15,550</u>

Income Statement
for the year ended March 31, 2007

	Rs.
Net Sales	13,50,000
Less: Cost of goods sold and operating expenses (including depreciation on buildings of Rs. 6,600 and depreciation on machinery of Rs. 11,400)	<u>12,58,950</u>
Net operating profit	91,050
Gain on sale of trade investments	6,400
Gain on sale of machinery	<u>1,850</u>
Profits before tax	99,300
Income-tax	<u>48,250</u>
Profits after tax	<u>51,050</u>

Additional information:

- (i) Machinery with a net book value of Rs. 9,150 was sold during the year.
- (ii) The shares of 'A' Ltd. were acquired by issue of debentures.

Required:

Prepare a Funds Flow Statement (Statement of changes in Financial position on Working capital basis) for the year ended March 31, 2007. (12 Marks)

Answer

Schedule of Changes in Working Capital

	March 31, 2007	March 31, 2006	Impact on Working Capital	
			Increase	Decrease
Current Assets				
Stock	58,800	46,150	12,650	—
Prepaid expenses	1,900	2,300	—	400
Debtors	76,350	77,150	—	800
Trade Investments	40,000	1,05,000	—	65,000
Cash	<u>77,400</u>	<u>95,900</u>	<u>—</u>	<u>18,500</u>
	<u>2,54,450</u>	<u>3,26,500</u>	<u>12,650</u>	<u>84,700</u>
Current Liabilities				
Creditors	28,800	27,100	—	1,700
Bank overdraft	7,500	6,250	—	1,250
Accrued expenses	4,350	4,600	250	—
Income tax payable	<u>48,250</u>	<u>16,850</u>	<u>—</u>	<u>31,400</u>
	<u>88,900</u>	<u>54,800</u>	<u>250</u>	<u>34,350</u>
Net Working Capital	1,65,550	2,71,700	12,900	1,19,050
Decrease in net working capital	<u>1,06,150</u>	<u>—</u>	<u>1,06,150</u>	<u>—</u>
	<u>2,71,700</u>	<u>2,71,700</u>	<u>1,19,050</u>	<u>1,19,050</u>

Machinery Account

	Rs.		Rs.
Balance b/d	1,07,050	Sale of machinery (given)	9,150
Purchase of machinery (plug)	24,350	Depreciation (given)	11,400
		Balance c/d	<u>1,10,850</u>
	<u>1,31,400</u>		<u>1,31,400</u>

Trade Investments Account			
	Rs.		Rs.
Balance b/d	1,05,000	Cash (sale of trade investments)	65,000
	<u> </u>	Balance c/d	<u>40,000</u>
	<u>1,05,000</u>		<u>1,05,000</u>

Estimation of Funds flow from Operations

		Rs.
Profits after tax		51,050
Add: Depreciation on Buildings	6,600	
Depreciation on Machinery	<u>11,400</u>	<u>18,000</u>
		69,050
Less: Gain on sale of machinery		<u>1,850</u>
Funds from Operations		<u>67,200</u>

Gain on sale of trade investments has been considered as an operating income. Trade investments have been considered as part of current assets.

**Statement of Changes in Financial Position (Working Capital basis)
for the year ended March 31, 2007**

	Rs.
Sources:	
Funds from operations	67,200
Sale of machinery on gain (9,150 + 1,850)	11,000
Debentures issued (Rs. 2,40,000 – 75,000)	1,65,000
Investment in 'A' Ltd. financial transaction and hence not affecting working capital	
Issue of share capital (including share premium)	<u>1,15,000</u>
Financial Resources Provided	<u>3,58,200</u>
Uses:	
Purchase of building (6,01,800 + 6,600 – 1,78,400)	4,30,000
Purchase of machinery	24,350
Payment of long-term loan	<u>10,000</u>
Financial Resources Applied	<u>4,64,350</u>
Net Decrease in Working Capital	<u>1,06,150</u>

Question 9

- (a) Discuss the conflicts in Profit versus Wealth maximization principle of the firm.
- (b) Using the following information, complete the Balance Sheet given below:
- | | | |
|---|---|---------|
| (i) Total debt to net worth | : | 1 : 2 |
| (ii) Total assets turnover | : | 2 |
| (iii) Gross profit on sales | : | 30% |
| (iv) Average collection period | : | 40 days |
| (Assume 360 days in a year) | | |
| (v) Inventory turnover ratio based on cost of goods sold and year-end inventory | : | 3 |
| (vi) Acid test ratio | : | 0.75 |

Balance Sheet
as on March 31, 2007

Liabilities	Rs.	Assets	Rs.
Equity Shares Capital	4,00,000	Plant and Machinery	—
Reserves and Surplus	6,00,000	and other Fixed Assets	
Total Debt:		Current Assets:	
Current Liabilities	—	Inventory	—
		Debtors	—
	_____	Cash	—
	_____		_____

(4 + 8 = 12 Marks)

Answer

- (a) Conflict in Profit versus Wealth Maximization Principle of the Firm

The company may pursue profit maximisation goal but that may not result into creation of shareholder value. The profits will be maximized if company grows through diversification and expansion. But all growth may not be profitable. Only that growth is profitable where

$ROA > WACC$ or $ROE > K_E$ or Firms invest in positive NPV profits.

However, profit maximisation cannot be the sole objective of a company. It is at best a limited objective. If profit is given undue importance, a number of problems can arise like the term profit is vague, profit maximisation has to be attempted with a realisation of risks

involved, it does not take into account the time pattern of returns and as an objective it is too narrow.

Whereas, on the other hand, wealth maximisation, as an objective, means that the company is using its resources in a good manner. If the share value is to stay high, the company has to reduce its costs and use the resources properly. If the company follows the goal of wealth maximisation, it means that the company will promote only those policies that will lead to an efficient allocation of resources.

(b) Networth = Capital + Reserves and surplus

$$= 4,00,000 + 6,00,000 = \text{Rs. } 10,00,000$$

$$\frac{\text{Total Debt}}{\text{Networth}} = \frac{1}{2}$$

$$\therefore \text{Total debt} = \text{Rs. } 5,00,000$$

$$\text{Total Liability side} = 4,00,000 + 6,00,000 + 5,00,000$$

$$= \text{Rs. } 15,00,000$$

$$= \text{Total Assets}$$

$$\text{Total Assets Turnover} = \frac{\text{Sales}}{\text{Total assets}}$$

$$2 = \frac{\text{Sales}}{15,00,000}$$

$$\therefore \text{Sales} = \text{Rs. } 30,00,000$$

$$\text{Gross Profit on Sales : } 30\% \text{ i.e. Rs. } 9,00,000$$

$$\therefore \text{COGS} = \text{Rs. } 30,00,000 - \text{Rs. } 9,00,000$$

$$= \text{Rs. } 21,00,000$$

$$\text{Inventory turnover} = \frac{\text{COGS}}{\text{Inventory}}$$

$$3 = \frac{21,00,000}{\text{Inventory}}$$

$$\therefore \text{Inventory} = \text{Rs. } 7,00,000$$

$$\text{Average collection period} = \frac{\text{Average debtors}}{\text{Sales / day}}$$

$$40 = \frac{\text{Debtors}}{30,00,000 / 360}$$

$$\therefore \text{Debtors} = \text{Rs. } 3,33,333.$$

$$\text{Acid test ratio} = \frac{\text{Current Assets} - \text{Stock}}{\text{Current liabilities}}$$

$$0.75 = \frac{\text{Current Assets} - 7,00,000}{5,00,000}$$

∴ Current Assets = Rs. 10,75,000.

∴ Fixed Assets = Total Assets – Current Assets
 = 15,00,000 – 10,75,000 = Rs. 4,25,000

Cash and Bank balance = Current Assets – Inventory – Debtors
 = 10,75,000 – 7,00,000 – 3,33,333 = Rs. 41,667.

Balance Sheet as on March 31, 2007

Liabilities	Rs.	Assets	Rs.
Equity Share Capital	4,00,000	Plant and Machinery and other	
Reserves & Surplus	6,00,000	Fixed Assets	4,25,000
Total Debt:		Current Assets:	
Current liabilities	5,00,000	Inventory	7,00,000
		Debtors	3,33,333
		Cash	41,667
	<u>15,00,000</u>		<u>15,00,000</u>