

PAPER – 4 : COST ACCOUNTING AND FINANCIAL MANAGEMENT

All questions are compulsory.

Working notes should form part of the answer.

Question 1

Answer any five of the following:

- (i) Discuss briefly the relevant costs with examples.
- (ii) Calculate total passenger kilometres from the following information:
Number of buses 6, number of days operating in a month 25, trips made by each bus per day 8, distance covered 20 kilometres (one side), capacity of bus 40 passengers, normally 80% of capacity utilization.
- (iii) Explain the importance of an Escalation Clause in contract cost.
- (iv) Calculate Efficiency and Capacity ratio from the following figures:

Budgeted production	80 units
Actual production	60 units
Standard time per unit	8 hours
Actual hours worked	500
- (v) Explain Blanket overhead rate.
- (vi) Explain the cost accounting treatment of unsuccessful Research and Development cost.

(10 Marks)

Answer

- (i) Relevant costs are those expected future cost which are essential but differ for alternative course or action.
 - (a) Historical cost or sunk costs are irrelevant as they do not play any role in the decision making process.
 - (b) Variable costs which will not differ under various alternatives are irrelevant.
- (ii) Calculation of passenger kilometers:
 $6 \times 25 \times 8 \times 2 \times 20 \times 40 \times 80\% = 15,36,000$ passenger kms.
- (iii) During the execution of a contract, the prices of materials, or labour etc., may rise beyond a certain limit. In such a case the contract price will be increased by an agreed amount. Inclusion of such a clause in a contract deed is called an Escalation Clause.
- (iv) Efficiency Ratio = $\frac{\text{Actual output in terms of standard hours}}{\text{Actual hour worked}} \times 100$

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$$\text{Or } \frac{480}{500} \times 100 = 96\%$$

$$\text{Capacity Ratio} = \frac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100$$

$$\text{Or } \frac{500}{640} \times 100 = 78.12\%$$

- (v) Blanket overhead rate refers to the computation of one single overhead rate for the entire factory. This is also known as plantwise or the single overhead rate for the entire factory. It is determined as follows:

$$\text{Blanket overhead rate} = \frac{\text{Overhead cost for the entire factory for the period}}{\text{Base for the period (Labour Hours, Machine Hours)}}$$

It is useful in companies producing the main product in continue process, e.g. chemical plant, glass plant etc.

- (vi) Cost of unsuccessful research is treated as factory overhead, provided the expenditure is normal and is provided in the budget. If it is not budgeted, it is written off to the profit and loss account. If the research is extended for long time, some failure cost is spread over to successful research.

Question 2

KPR Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. The Standard Cost Card of a product is as under:

Standard		Unit cost (Rs.)
Direct material	5 kgs @ Rs. 4.20	21.00
Direct labour	3 hours @ Rs. 3.00	9.00
Factory overhead	Rs. 1.20 per labour hour	<u>3.60</u>
	Total manufacturing cost	<u>33.60</u>

The production schedule for the month of June, 2007 required completion of 40,000 units. However, 40,960 units were completed during the month without opening and closing work-in-process inventories.

Purchases during the month of June, 2007, 2,25,000 kgs of material at the rate of Rs. 4.50 per kg. Production and Sales records for the month showed the following actual results.

Material used 2,05,600 kgs.

Direct labour 1,21,200 hours; cost incurred	Rs. 3,87,840
Total factory overhead cost incurred	Rs. 1,00,000
Sales	40,000 units

Selling price to be so fixed as to allow a mark-up of 20 per cent on selling price.

Required:

- (i) Calculate material variances based on consumption of material.
- (ii) Calculate labour variances and the total variance for factory overhead.
- (iii) Prepare Income statement for June, 2007 showing actual gross margin.
- (iv) An incentive scheme is in operation in the company whereby employees are paid a bonus of 50% of direct labour hour saved at standard direct labour hour rate. Calculate the Bonus amount. (15 Marks)

Answer

(i) Material variances:

- (a) Direct material cost variance = Standard cost – Actual cost
 $= 40,960 \times 21 - 2,05,600 \times 4.50$
 $= 8,60,160 - 9,25,200 = 65,040 \text{ (A)}$
- (b) Material price variance = AQ (SP – AP)
 $= 2,05,600 (4.20 - 4.50) = 61,680 \text{ (A)}$
- (c) Material usages variance = SP (SQ – AQ)
 $= 4.20 (40,960 \times 5 - 2,05,600) = 3,360 \text{ (A)}$

(ii) Labour variances and overhead variances:

- (a) Labour cost variance = Standard cost – Actual cost
 $= 40,960 \times 9 - 3,87,840 = 19,200 \text{ (A)}$
- (b) Labour rate variance = AH (SR – AR)
 $1,21,200 (3 - 3.20) = 24,240 \text{ (A)}$
- (c) Labour efficiency variance = SR (SH – AH)
 $= 3 (40,960 \times 3 - 1,21,200) = 5,040 \text{ (F)}$
- (d) Total factory overhead variance = Factory overhead absorbed – factory overhead incurred
 $= 40,960 \times 3 \times 1.20 - 1,00,000 = 47,456 \text{ (F)}$

(iii) Preparation of income statement

Calculation of unit selling price	Rs.
Direct material	21
Direct labour	9
Factory overhead	<u>3.60</u>
Factory cost	33.60
Margin 25% on factory cost	<u>8.40</u>
Selling price	<u>42.00</u>

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Income statement

		Rs.
Sales 40,000 units × 42		16,80,000
Less: Standard cost of goods sold 40,000 × 33.60		<u>13,44,000</u>
		3,36,000
Less: Variances adverse		
Material price variance	61,680	
Material quantity variance	3,360	
Labour rate variance	<u>24,240</u>	<u>89,280</u>
		2,46,720
Add: Favourable variance		
Labour efficiency variance	5,040	
Factory overhead	<u>47,456</u>	<u>52,496</u>
Actual gross margin		<u>2,99,216</u>

(iv)	Labour hour saved	Rs.
	Standard labour hours 40,960 × 3	1,22,880
	Actual labour hour worked	<u>1,21,200</u>
	Labour hour saved	<u>1,680</u>

Bonus for saved labour = .50 (1,680 × 3) = 2,520.

Question 3

- (a) ABC Limited manufactures a product 'ZX' by using the process namely RT. For the month of May, 2007, the following datas are available:

	Process RT
Material introduced (units)	16,000
Transfer to next process (units)	14,400
Work in process:	
At the beginning of the month (units)	4,000
(4/5 completed)	
At the end of the month (units)	3,000
(2/3 completed)	
Cost records:	
Work in process at the beginning of the month	

Material	Rs. 30,000
Conversion cost	Rs. 29,200
Cost during the month : materials	Rs. 1,20,000
Conversion cost	Rs. 1,60,800

Normal spoiled units are 10% of goods finished output transferred to next process.

Defects in these units are identified in their finished state. Material for the product is put in the process at the beginning of the cycle of operation, whereas labour and other indirect cost flow evenly over the year. It has no realizable value for spoiled units.

Required:

- (i) Statement of equivalent production (Average cost method);
 - (ii) Statement of cost and distribution of cost;
 - (iii) Process accounts.
- (b) A machine shop cost centre contains three machines of equal capacities. Three operators are employed on each machine, payable Rs. 20 per hour each. The factory works for fortyeight hours in a week which includes 4 hours set up time. The work is jointly done by operators. The operators are paid fully for the fortyeight hours. In additions they are paid a bonus of 10 per cent of productive time. Costs are reported for this company on the basis of thirteen four-weekly period.

The company for the purpose of computing machine hour rate includes the direct wages of the operator and also recoups the factory overheads allocated to the machines. The following details of factory overheads applicable to the cost centre are available:

- ◆ Depreciation 10% per annum on original cost of the machine. Original cost of the each machine is Rs. 52,000.
- ◆ Maintenance and repairs per week per machine is Rs. 60.
- ◆ Consumable stores per week per machine are Rs. 75.
- ◆ Power : 20 units per hour per machine at the rate of 80 paise per unit.
- ◆ Apportionment to the cost centre : Rent per annum Rs. 5,400, Heat and Light per annum Rs. 9,720, and foreman's salary per annum Rs. 12,960.

Required:

- (i) Calculate the cost of running one machine for a four week period.
- (ii) Calculate machine hour rate. (8 + 8 = 16 Marks)

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Answer

(a) Statement of equivalent production of Process RT

Input units	Details	Output units	Equivalent Production			
			Material % units	%	Conversion cost units	
4,000	Opening WIP					
16,000	Introduced completed and transfer to next	14,400	14,400	100%	14,400	100%
	Normal spoilage	1,440	1,440	100%	1,440	100%
	Abnormal Spoilage	1,160	1,160	100%	1,160	100%
	Closing WIP	3,000	3,000	100%	2,000	66.67%
<u>20,000</u>		<u>20,000</u>	<u>20,000</u>		<u>19,000</u>	

Statement showing cost of each element

	Opening	Cost in Process	Total	Equivalent Units	Cost per units
	(Rs.)	(Rs.)	(Rs.)		
Materials	30,000	1,20,000	1,50,000	20,000	7.50
Conversion cost	29,200	1,60,800	1,90,000	19,000	10.00

Statement of apportionment of cost

Units completed	Material	14,400	7.50	
	Conversion cost	14,400	10.00	2,52,000
	Normal spoilage (10%)			25,200
Closing stock	Material	3,000	7.50	
	Conversion cost	2,000	10.00	42,500
Abnormal stock	Material	1,160	7.50	
	Conversion cost	1,160	10.00	20,300

Process Account					
		Rs.			Rs.
To	Opening WIP	59,200	By	Profit and Loss Account (Abnormal)	20,300
To	Material	1,20,000	By	Transfer to next process	2,77,200
To	Conversion cost	<u>1,60,800</u>	By	Closing WIP	<u>42,500</u>
		<u>3,40,000</u>			<u>3,40,000</u>

(b) Computation of cost of running one machine for a four week period

	Rs.
Standing charges	Per annum
Rent	5,400
Heat and light	9,720
Forman's salary	<u>12,960</u>
	<u>28,080</u>

$$\text{Total expenses for one machine for four week period} = \frac{28,080 \times 4}{3 \times 13} \quad \text{Rs. } 2,880$$

$$\text{Wages: Hours per week} = 48 \text{ and hours for 4 weeks} = 48 \times 4 = 192$$

$$\text{Wages } 192 \times 20 \quad \text{Rs. } 3,840$$

$$\text{Bonus } (192 - 16) = 176 \times 20 \times .10 \quad \text{Rs. } \underline{352}$$

(i) Total standing charges 7,072

Machine Expenses:

$$\text{Depreciation} = \left(52,000 \times 10\% \times \frac{4}{13} \right) \quad \text{Rs. } 1,600$$

$$\text{Repairs and maintenance} = (60 \times 4) \quad \text{Rs. } 240$$

$$\text{Consumable stores } (75 \times 4) \quad \text{Rs. } 300$$

$$\text{Power } (192 - 16) = 176 \times 20 \times .80 \quad \text{Rs. } \underline{2,816}$$

(ii) Total machine expenses 4,956

$$\text{Total expenses (i) + (ii)} \quad \text{Rs. } \underline{\underline{12,028}}$$

$$\text{Machine hour rate} = \frac{12,028}{176} = 68.34.$$

Question 4

Answer any three of the following:

- (i) Explain essential pre-requisites for integrated accounts.
- (ii) Explain, why the Last in First out (LIFO) has an edge over First in First out (FIFO) or any other method of pricing material issues.
- (iii) Enumerate the remedial steps to be taken to minimize the labour turnover.
- (iv) A company produces single product which sells for Rs. 20 per unit. Variable cost is Rs. 15 per unit and Fixed overhead for the year is Rs. 6,30,000.

Required:

- (a) Calculate sales value needed to earn a profit of 10% on sales.
- (b) Calculate sales price per unit to bring BEP down to 1,20,000 units.
- (c) Calculate margin of safety sales if profit is Rs. 60,000. (3 × 3 = 9 Marks)

Answer

- (i) Essential pre-requisites for integrated accounts:
 - (a) The management's decision about the extent of integration of the two sets of books.
 - (b) A suitable coding system must be made available so as to serve the accounting purposes of financial and cost accounts.
 - (c) An agreed routine, with regard to the treatment of provision for accruals, prepaid expenses, other adjustment necessary for preparation of interim accounts.
 - (d) Perfect coordination should exist between the staff responsible for the financial and cost accounts and an efficient processing of accounting document should be ensured.
- (ii) LIFO has following advantages:
 - (a) The cost of the material issued will be reflecting the current market price.
 - (b) The use of the method during the period of rising prices does not reflect undue high profit in the income statement.
 - (c) In the case of falling price, profit tend to rise due to lower material cost, yet the finished goods appear to be more competitive and are at market price.
 - (d) During the period of inflation, LIFO will tend to show the correct profit.
- (iii) The following steps are useful for minimizing labour turnover:
 - (a) Exit interview: An interview be arranged with each outgoing employee to ascertain the reasons of his leaving the organization.
 - (b) Job analysis and evaluation: to ascertain the requirement of each job.

- (c) Organisation should make use of a scientific system of recruitment, placement and promotion for employees.
- (d) Organisation should create healthy atmosphere, providing education, medical and housing facilities for workers.
- (e) Committee for settling workers grievances.
- (iv) (a) Suppose sales units are x then

$$S = V + F + P$$

$$S = \text{Sales}$$

$$V = \text{Variable Cost}$$

$$F = \text{Fixed Cost}$$

$$P = \text{Profit}$$

$$20x = 15x + 6,30,000 + 2x$$

$$20x - 17x = 6,30,000$$

$$\therefore x = \frac{6,30,000}{3} = 2,10,000 \text{ units}$$

$$\text{Sales value} = 2,10,000 \times 20 = \text{Rs. } 42,00,000$$

- (b) Sales price to down BEP 1,20,000 units

$$S = V + \frac{F}{\text{New BEP}} \therefore S = 15 + \frac{6,30,000}{1,20,000} \therefore \text{Rs. } 20.25.$$

- (c) MS Sales = $\frac{\text{Profit}}{\text{P/V ratio}} \therefore \frac{60,000}{\text{P/V}}$ where $\text{P/V} = \frac{C}{S} \times 100$.

$$\therefore \frac{60,000}{25} \times 100 = 2,40,000 \quad \text{Or} \quad \frac{5}{20} \times 100 = 25\%.$$

Question 5

Answer any five of the following:

- (i) Explain the concept of leveraged lease.
- (ii) Discuss the features of deep discount bonds.
- (iii) What is optimum capital structure? Explain.
- (iv) A firm has Sales of Rs. 40 lakhs; Variable cost of Rs. 25 lakhs; Fixed cost of Rs. 6 lakhs; 10% debt of Rs. 30 lakhs; and Equity Capital of Rs. 45 lakhs.

Required:

Calculate operating and financial leverage.

- (v) The demand for a certain product is random. It has been estimated that the monthly demand of the product has a normal distribution with a mean of 390 units. The unit price of product is Rs. 25. Ordering cost is Rs. 40 per order and inventory carrying cost is estimated to be 35 per cent per year.

Required:

Calculate Economic Order Quantity (EOQ).

- (vi) Explain the concept of Indian depository receipts. (5 × 2 = 10 Marks)

Answer

- (i) **Concept of Leveraged Lease:** Leveraged lease involves lessor, lessee and financier. In leveraged lease, the lessor makes a substantial borrowing, even upto 80 per cent of the assets purchase price. He provides remaining amount – about 20 per cent or so – as equity to become the owner. The lessor claims all tax benefits related to the ownership of the assets. Lenders, generally large financial institutions, provide loans on a non-recourse basis to the lessor. Their debt is served exclusively out of the lease proceeds. To secure the loan provided by the lenders, the lessor also agrees to give them a mortgage on the asset. Leveraged lease are called so because the high non-recourse debt creates a high degree of leverage.
- (ii) **Features of Deep Discount Bonds:** Deep discount bonds are form of zero interest bonds. These bonds are sold at discounted value and on maturity; face value is paid to the investors. In such bonds, there is no interest payout during the lock- in period. IDBI was the first to issue deep discount bonds in India in January 1993. The bond of a face value of Rs. 1 lakh was sold for Rs. 2700 with a maturity period of 25 years.
- (iii) **Optimum Capital Structure:** Optimum capital structure deals with the issue of right mix of debt and equity in the long-term capital structure of a firm. According to this, if a company takes on debt, the value of the firm increases upto a certain point. Beyond that value of the firm will start to decrease. If the company is unable to pay the debt within the specified period then it will affect the goodwill of the company in the market. Therefore, company should select its appropriate capital structure with due consideration of all factors.
- (iv) **Calculation of Operating and Financial Leverage**

	Rs.
Sales	40,00,000
Less: Variable cost	<u>25,00,000</u>
Contribution (C)	15,00,000
Less: Fixed cost	<u>6,00,000</u>
EBIT	9,00,000
Less: Interest	<u>3,00,000</u>
EBT	<u>6,00,000</u>

$$\text{Operating leverage} = \frac{C}{\text{EBIT}} = \frac{15,00,000}{9,00,000} = 1.67$$

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{9,00,000}{6,00,000} = 1.50$$

(v) Calculation of Economic Order Quantity (EOQ)

The mean of monthly demand = 390 units, Annual demand (A) = 390 × 12 = 4,680 units

Ordering cost (O) = Rs. 40 per order, Cost per unit = Rs. 25.

Inventory carrying cost of one unit (CC) = Rs. 25 × 35% = Rs. 8.75

$$\text{EOQ} = \sqrt{\frac{2AO}{\text{CC}}} = \sqrt{2 \times 4,680 \times \frac{40}{8.75}} = 206.85 \text{ or } 207 \text{ units}$$

(vi) Concept of Indian Depository Receipts: The concept of the depository receipt mechanism which is used to raise funds in foreign currency has been applied in the Indian capital market through the issue of Indian Depository Receipts (IDRs). Foreign companies can issue IDRs to raise funds from Indian market on the same lines as an Indian company uses ADRs/GDRs to raise foreign capital. The IDRs are listed and traded in India in the same way as other Indian securities are traded.

Question 6

The Balance Sheet of X Ltd. as on 31st March, 2007 is as follows:

Liabilities	Rs. ('000)	Assets	Rs. ('000)
Equity share capital	6,000	Fixed Assets (at cost)	16,250
8% Preference share capital	3,250	Less: Depreciation written off	<u>5,200</u>
Reserves and Surplus	1,400	Stock	1,950
10% Debentures	1,950	Sundry debtors	2,600
Sundry Creditors	<u>3,250</u>	Cash	<u>250</u>
Total	<u>15,850</u>		<u>15,850</u>

The following additional information is available:

- (i) The stock turnover ratio based on cost of goods sold would be 6 times.
- (ii) The cost of fixed assets to sales ratio would be 1.4.
- (iii) Fixed assets costing Rs. 30,00,000 to be installed on 1st April, 2007, payment would be made on March 31, 2008.
- (iv) In March, 2008, a dividend of 7 per cent on equity capital would be paid.

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- (v) Rs. 5,50,000, 11% Debentures would be issued on 1st April, 2007.
- (vi) Rs. 30,00,000, Equity shares would be issued on 31st March, 2008.
- (vii) Creditors would be 25% of materials consumed.
- (viii) Debtors would be 10% of sales.
- (ix) The cost of goods sold would be 90 per cent of sales including material 40 per cent and depreciation 5 per cent of sales.
- (x) The profit is subject to debenture interest and taxation @ 30 per cent.

Required:

- (i) Prepare the projected Balance Sheet as on 31st March, 2008.
- (ii) Prepare projected Cash Flow Statement in accordance with AS-3. (15 Marks)

Answer

- (i) Calculation of Sales

Fixed assets Rs. (1,62,50,000 + 30,00,000) = 1,92,50,000

$$\text{Sales} = \frac{1,92,50,000}{1.4} = 1,37,50,000$$

Cost of goods sold	= 1,37,50,000 × .90	= 1,23,75,000
Material	= 1,37,50,000 × .40	= 55,00,000
Depreciation	= 1,37,50,000 × .05	= 6,87,500
Net profit	= 1,37,50,000 × .10	= 13,75,000

Calculation of Net Fixed Assets

	Rs.
Opening balance	1,62,50,000
Add: Purchases	<u>30,00,000</u>
	<u>1,92,50,000</u>
Less: Accumulated Depreciation	52,00,000
Additional Depreciation	<u>6,87,500</u>
Closing balance of fixed assets	<u>1,33,62,500</u>

Calculation of Closing Stock

$$\begin{aligned} \text{Average stock} &= \frac{\text{Cost of goods sold}}{\text{Stock turnover ratio}} \\ &= \frac{1,23,75,000}{6} = 20,62,500 \end{aligned}$$

$$\text{Average stock} = \frac{(\text{Opening stock} + \text{Closing stock})}{2}$$

$$20,62,500 = \frac{(19,50,000 + \text{Closing stock})}{2}$$

$$\text{Closing stock} = 41,25,000 - 19,50,000 = 21,75,000$$

$$\text{Calculation of Debtors} = 1,37,50,000 \times .10 = 13,75,000$$

$$\text{Calculation of Creditors} = 55,00,000 \times .25 = 13,75,000$$

Calculation of Interest and Provision for Taxation

Net profit	13,75,000
Less: Interest (19,50,000 × 10%)	<u>2,55,500</u>
(5,50,000 × 11%)	11,19,500
Less: Taxes	<u>3,35,850</u>
Net profit available for dividend	7,83,650
Less: Preference share dividend	2,60,000
Less: Equity dividend @ 7%	<u>4,20,000</u>
Transfer to reserves and surplus	<u>1,03,650</u>
Reserves and Surplus	
Opening balance	14,00,000
Add: Current balance	<u>1,03,650</u>
	15,03,650

Projected Cash Flow Statement

(i) Cash flow from Operating Activities	
Profit after taxation	7,83,650
Depreciation added back	<u>6,87,500</u>
	14,71,150
Add: Increase in current liabilities and decrease in current assets	
Provision for taxation	3,35,850
Debtors (26,00,000 – 13,75,000)	12,25,000
Less: Increase in current assets and decrease in current liabilities	
Stock (21,75,000 – 19,50,000)	(2,25,000)
Creditors (13,75,000 – 32,50,000)	(18,75,000)
Net Cash from Operating Activities	<u>(21,00,000)</u>
	9,32,000

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(ii) Cash flow from Investing Activities		
Purchase of Fixed Assets		(30,00,000)
(iii) Cash flow from Financing Activities		
Issue of Debenture	5,50,000	
Issue of equity share capital	30,00,000	
Dividend paid	(6,80,000)	<u>28,70,000</u>
Net increase in cash		8,02,000
Opening balance of cash		<u>2,50,000</u>
Closing balance		<u>10,52,000</u>

Projected Balance Sheet as on 31st March, 2008

Liabilities	Rs. ('000)	Assets	Rs. ('000)
Equity share capital	9,000	Fixed Assets (at cost)	19,250
8% Preference share capital	3,250	Less: Depreciation written off	5,887.5
Reserves & Surplus	1,503.65	Stock	2,175
10% & 11% Debentures	2,500	Sundry debtors	1,375
Sundry Creditors	1,375	Cash	1,052
Provision for taxation	<u>335.85</u>		
Total	<u>17,964.5</u>	Total	<u>17,964.5</u>

Question 7

- (a) A newly formed company has applied to the Commercial Bank for the first time for financing its working capital requirements. The following information is available about the projections for the current year:

Elements of cost:	Per unit (Rs.)
Raw material	40
Direct labour	15
Overhead	<u>30</u>
Total cost	85
Profit	<u>15</u>
Sales	<u>100</u>

Other information:

Raw material in stock : average 4 weeks consumption, Work – in progress (completion stage, 50 per cent), on an average half a month. Finished goods in stock : on an average, one month.

Credit allowed by suppliers is one month.

Credit allowed to debtors is two months.

Average time lag in payment of wages is 1½ weeks and 4 weeks in overhead expenses.

Cash in hand and at bank is desired to be maintained at Rs. 50,000.

All Sales are on credit basis only.

Required:

- (i) Prepare statement showing estimate of working capital needed to finance an activity level of 96,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overhead accrue similarly. For the calculation purpose 4 weeks may be taken as equivalent to a month and 52 weeks in a year.
 - (ii) From the above information calculate the maximum permissible bank finance by all the three methods for working capital as per Tondon Committee norms; assume the core current assets constitute 25% of the current assets.
- (b) XYZ Ltd. is planning to introduce a new product with a project life of 8 years. The project is to be set up in Special Economic Zone (SEZ), qualifies for one time (at starting) tax free subsidy from the State Government of Rs. 25,00,000 on capital investment. Initial equipment cost will be Rs. 1.75 crores. Additional equipment costing Rs. 12,50,000 will be purchased at the end of the third year from the cash inflow of this year. At the end of 8 years, the original equipment will have no resale value, but additional equipment can be sold for Rs. 1,25,000. A working capital of Rs. 20,00,000 will be needed and it will be released at the end of eighth year. The project will be financed with sufficient amount of equity capital.

The sales volumes over eight years have been estimated as follows:

Year	1	2	3	4–5	6–8
Units	72,000	1,08,000	2,60,000	2,70,000	1,80,000

A sales price of Rs. 120 per unit is expected and variable expenses will amount to 60% of sales revenue. Fixed cash operating costs will amount Rs. 18,00,000 per year. The loss of any year will be set off from the profits of subsequent two years. The company is subject to 30 per cent tax rate and considers 12 per cent to be an appropriate after tax cost of capital for this project. The company follows straight line method of depreciation.

Required:

Calculate the net present value of the project and advise the management to take appropriate decision.

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Note:

The PV factors at 12% are

Year	1	2	3	4	5	6	7	8
	.893	.797	.712	.636	.567	.507	.452	.404

(8 + 8 = 16 Marks)

Answer

(a) Calculation of Working Capital Requirement

(A) Current Assets

		Rs.
(i)	Stock of material for 4 weeks $(96,000 \times 40 \times 4/52)$	2,95,385
(ii)	Work in progress for $\frac{1}{2}$ month or 2 weeks	
	Material $(96,000 \times 40 \times 2/52) .50$	73,846
	Labour $(96,000 \times 15 \times 2/52) .50$	27,692
	Overhead $(96,000 \times 30 \times 2/52) .50$	<u>55,385</u>
		1,56,923
(iii)	Finished stock $(96,000 \times 85 \times 4/52)$	6,27,692
(iv)	Debtors for 2 months $(96,000 \times 85 \times 8/52)$	12,55,385
	Cash in hand or at bank	50,000
	Investment in Current Assets	23,85,385

(B) Current Liabilities

(i)	Creditors for one month $(96,000 \times 40 \times 4/52)$	2,95,385
(ii)	Average lag in payment of expenses	
	Overheads $(96,000 \times 30 \times 4/52)$	2,21,538
	Labour $(96,000 \times 15 \times 3/104)$	<u>41,538</u>
	Current Liabilities	<u>5,58,461</u>
	Net working capital (A – B)	<u>18,26,924</u>

Minimum Permissible Bank Finance as per Tandon Committee

Method I : .75 (Current Assets – Current Liabilities)

.75 (23,85,385 – 5,58,461)

.75 (18,26,924) – 5,58,461 = Rs. 13,70,193

Method II : .75 × Current Assets – Current Liabilities

.75 × 23,85,385 – 5,58,461

17,89,039 – 5,58,461 = Rs. 12,30,578

Method III: .75 (Current Assets – CCA) – Current Liabilities
 .75 (23,85,385 – 5,96,346) – 5,58,461
 .75 (17,89,039) – 5,58,461
 13,41,779 – 5,58,461 = Rs. 7,83,318

(b) (Rs. '000)

Year	Sales	VC	FC	Dep.	Profit	Tax	PAT	Dep.	Cash inflow
1	86.40	51.84	18	21.875	(5.315)	–	–	21.875	16.56
2	129.60	77.76	18	21.875	11.965 – (5.315) = 6.65 After adjustment of loss	1.995	4.655	21.875	26.53
3	312.00	187.20	18	21.875	84.925	25.4775	59.4475	21.875	81.3225
4–5	324.00	194.40	18	24.125	87.475	26.2425	61.2325	24.125	85.3575
6–8	216.00	129.60	18	24.125	44.275	13.2825	30.9925	24.125	55.1175

Cost of New Equipment	Rs. 1,75,00,000
Less: Subsidy	25,00,000
Add: Working Capital	<u>20,00,000</u>
Outflow	<u>1,70,00,000</u>

Calculation of NPV

Year	Cash inflows (Rs.)	PV factor	NPV (Rs.)
1	16,56,000	.893	14,78,808
2	26,53,000	.797	21,14,441
3	81,32,250 – 12,50,000 = 68,82,250	.712	49,00,162
4	85,35,750	.636	54,28,737
5	85,35,750	.567	48,39,770
6	55,11,750	.507	27,94,457
7	55,11,750	.452	24,91,311
8	55,11,750 + 20,00,000 + 1,25,000 = 76,36,750	.404	<u>30,85,247</u>
	Net Present Value		<u>2,71,32,933</u>

NPV	2,71,32,933
Less: Out flow	<u>1,70,00,000</u>
Saving	<u>1,01,32,933</u>

Advise: Since the project has a positive NPV, therefore, it should be accepted.

Question 8

Answer any three of the following:

- (i) Explain the assumptions of Net Operating Income approach (NOI) theory of capital structure.
- (ii) Explain the limitations of profit maximization objective of Financial Management.
- (iii) Explain the methods of venture capital financing.
- (iv) Z Ltd.'s operating income (before interest and tax) is Rs. 9,00,000. The firm's cost of debt is 10 per cent and currently firm employs Rs. 30,00,000 of debt. The overall cost of capital of firm is 12 per cent.

Required:

Calculate cost of equity.

(3 × 3 = 9 Marks)

Answer

- (i) Assumptions of Net Operating Income (NOI) Theory of Capital Structure

According to NOI approach, there is no relationship between the cost of capital and value of the firm i.e. the value of the firm is independent of the capital structure of the firm.

Assumptions

- (a) The corporate income taxes do not exist.
- (b) The market capitalizes the value of the firm as whole. Thus the split between debt and equity is not important.
- (c) The increase in proportion of debt in capital structure leads to change in risk perception of the shareholders.
- (d) The overall cost of capital (K_o) remains constant for all degrees of debt equity mix.

- (ii) Limitations of Profit Maximisation Objective of Financial Management

- (a) Time factor is ignored.
- (b) It is vague because it is not clear whether the term relates to economic profit, accounting profit, profit after tax or before tax.
- (c) The term maximization is also ambiguous.
- (d) It ignores the risk factor.

(iii) Some Common Methods of Venture Capital Financing

- (a) Equity financing: The venture capital undertaking requires long-term funds but is unable to provide returns in initial stage so equity capital is the best option.
- (b) Conditional Loan: A conditional loan is repayable in the form of a royalty after the venture is able to generate sales. No interest is paid on such loans.
- (c) Income note: It is hybrid security; the entrepreneur has to pay both interest and royalty on sales but at substantially low rates.
- (d) Participating debenture: Such security carries charges in three phases - in the start-up phase, no interest is charged, next stage a low rate of interest up to a particular level of operation is charged, after that, high rate of interest is required to be paid.

(iv) Calculation of Cost of Equity

$$\begin{aligned} \text{Calculation of value of firm (V)} &= \frac{\text{EBIT}}{\text{Overall cost of capital (K}_o\text{)}} \\ &= \frac{9,00,000}{0.12} = \text{Rs. } 75,00,000 \end{aligned}$$

$$\begin{aligned} \text{Market value of equity (S)} &= V - \text{Debts} \\ &= 75,00,000 - 30,00,000 = \text{Rs. } 45,00,000 \end{aligned}$$

$$\text{Market value of debts (D)} = 30,00,000$$

$$\begin{aligned} K_e (\text{Cost of equity}) &= K_o \left(\frac{V}{S} \right) - K_d \left(\frac{D}{S} \right) \\ &= 0.12 \left(\frac{75,00,000}{45,00,000} \right) - 0.10 \left(\frac{30,00,000}{45,00,000} \right) \\ &= 0.20 - .067 = .133 \times 100 \\ K_e &= 13.3\%. \end{aligned}$$