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10ME71

Seventh Semester B.E. Degree Examination, June/July 2017

Engineering Economy

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer FIVE full questions, selecting at least TWO questions from each part.***
2. ***Use of compounding interest factors tables is permitted.***

PART – A

1 a. Briefly explain the problem solving process. How are the decisions taken? **(06 Marks)**

b. Briefly explain the law of demand and law of supply. **(06 Marks)**

c. A person is planning for his retired life. He has 15 years of service, he would like to deposit 20% of salary, which is Rs.12000 at the end of 1st year and there after he wishes to increase his deposit by Rs.2000 more every year along with Rs.12000 for next 14 years. What will be maturity amount of this deposit, if the interest rates are 10% and 12% per year? **(08 Marks)**

2 a. List and explain the conditions for present worth comparisons. **(10 Marks)**

b. Two devices are available to perform a necessary function for 3 years. The initial cost (negative) for each device at time 0 and subsequent annual savings (positive) are shown in the following table.
Compare the net present worth of these two devices when the required interest rate is 8%. Draw cash flow diagram.

	Year			
	0	1	02	03
Device A	-15000	6000	7000	8000
Device B	-18000	7000	8000	9000

(P/F, 8.1) = 0.92593
(P/F, 8.2) = 0.85734
(P/F, 8.3) = 0.79383

(10 Marks)

3 a. Define the following terms with reference to asset life:
i) Accounting life
ii) Service life. **(04 Marks)**

b. A stand by lighting generator is required for a shop two types are available. If both generators have life of 4 years and interest rate is 15%, which offers lowest equivalent annual cost? **(08 Marks)**

	Type – 1	Type – 2
First cost	Rs.8000	Rs.6000
Salvage value	Rs.1500	Nil
Annual operating cost	Rs.800	Rs.900

c. The following alternatives can perform the same function:

Alternative	First cost	Life	Salvage value	Annual cost
A	Rs.7000	6 years	2500	900
B	Rs.5000	3 years	1500	1200

At an annual rate of 12%, rank alternative as per the equivalent annual cost. **(08 Marks)**

4 a. A company is in process of selecting the best alternative among the following three mutually exclusive alternatives. Find the best alternative based on rate of return (calculation) comparison. **(10 Marks)**

Alternative	Initial Investment	Annual revenue	Life in years
A_1	Rs.60000	Rs.15000	10
A_2	Rs.85000	Rs.19000	10
A_3	Rs.50000	Rs.9000	10

b. A car was purchased for Rs.5,00,000 and salvage value Rs.1,50,000 at the end of 8 years of useful life. Calculate book value of the car at the end of 5^{th} year by declining balance method. Straight line method of depreciation. Also find the accumulative depreciation at the end of 6^{th} year by declining balance method and sum of the year digit method of depreciation. **(10 Marks)**

PART – B

5 a. Briefly explain the contents of elements of cost. **(06 Marks)**

b. A product xyz manufactured in a small scale industry has the following details:

Variable overheads = Rs.30 per unit
Fixed overheads = Rs.70000 per month
Units manufactured 70000 units per month.

Find:

i) The normal overhead cost per unit
ii) If production drops to 80%, find overhead charges per unit.
iii) If production increases to 120%, find overhead charges per unit corresponding to above description. **(08 Marks)**

c. MICO factory produces 8000 spark plug per day involving a direct material cost of Rs.6,00,000. Direct labour cost of Rs.5,00,000 and factory overheads of Rs.2,00,000. Assume a profit of 20% of selling price and selling overheads are 30% of factory cost. Calculate the selling price of each spark plug. **(06 Marks)**

6 a. Write the balance sheet equation. Following is the year end details of a company.

Equity	Rs.2,00,000
Bank balance	Rs.10,000
Dividend payable	Rs.72,000
Provision for tax	Rs.40,000
Preference shares	Rs.1,35,000
Land and building	Rs.2,00,000
Debtors	Rs.2,65,000
Bills payable	Rs.20,000
Plant and equipment	Rs.80,000
Bills receivable	Rs.20,000
General reserves	Rs.40,000
Cash in hand	Rs.15000
Stock	Rs.77000
Creditors	Rs.160000

(10 Marks)

b. Define the following with suitable equations:

i) Current ratio ii) Acid list ratio iii) Debt equity ratio
iv) Gross profit ratio v) Net profit ratio **(10 Marks)**

7 a. What is a financial ratio? Explain liquidity and solvency ratio, mentioning their significance. **(10 Marks)**

b. Calculate the current assets of xyz company with the following information:
Stock turn over = 5 times
Stock at the end = 5000 more than the stock at the beginning
Sales = 2,00,000
Gross profit ratio = 20%
Current liabilities = Rs.60000
Quick ratio = 0.75 **(10 Marks)**

8 a. Briefly explain the objectives of profit planning. **(08 Marks)**

b. Draw a flexible budget for the overhead expenses on the following data and determine the overhead rate at 70%, 80% and 90% plant capacity.

Particular	Plant capacity (80%)
Variable overheads	
Indirect labour	Rs.1,25,000
Stores including spares	45000
Semi variable overheads	
Power (50% fixed)	2,25,000
Repairs and maintenance	20,000
Fixed overheads	
Depreciation	1,20,000
Insurance	35,000
Salaries	1,25,000
Estimated labour hours	1,60,000

(12 Marks)

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