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10ME71

Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017
Engineering Economy

Time: 3 hrs. Max. Marks:100

Note: 1. *Answer FIVE full questions, selecting at least TWO questions from each part.*
2. *Missing data to be assumed suitably.*
3. *Use of interest factor table is permitted.*

PART – A

1 a. Discuss the interest rate from borrower's and lenders point of view with cash flow diagram. **(05 Marks)**

b. Explain law of demand and supply with suitable example. **(05 Marks)**

c. Determine the effective interest rate for a nominal annual rate of 6 percent that is compounded : (i) Semiannually (ii) Quarterly (iii) Monthly (iv) Daily **(06 Marks)**

d. Deduce the expression for sinking fund factor (uniform series). **(04 Marks)**

2 a. What do you understand by present worth by the "72 Rule"? **(02 Marks)**

b. Machine A has the first cost of ₹ 9000, no salvage value at the end of its 6-years useful life and annual operating cost of ₹ 5000. Machine B costs ₹ 16000 new and has an expected resale value of ₹ 4000 at the end of its 9 year economic life. Operating cost for machine B are ₹ 4000 per year. Compare the two alternatives on the basis of their present worths, using the repeated projects assumption at 10 percent annual interest. **(08 Marks)**

c. A wealthy industrial economist dies and her will specifies that ₹ 5 million of her estate will go to xyz university to fund a small engineering economy building as well as 20 graduate scholarships per year over the next 20 years. The scholarships are to have a value of ₹ 12000 per year for the first year and should increase at a rate ₹ 1500 per year over the following 19 years. xyz university requires that ₹ 15000, starting with the third year of the bequest, be reserved for building maintenance and operating costs. These costs are to have a linear increase of ₹ 2000 per year, starting with year 4. Assuming that a 10 percent interest rate is used for such analysis, determine how much will be available for building first costs. **(10 Marks)**

3 a. What is annuity contract for a guaranteed income? Explain. **(04 Marks)**

b. What is the uniform series value "A" of the following cash flow with non equal interest rates shown below: **(08 Marks)**

End of year	0	1	2	3	4	5
Interest rate %		7	7	9	10	5
Reciepts in Rs.	10,000		10,000		10,000	
Payments in Rs.	3,000		6,000		11,000	

c. Two types of power converters, alpha and beta are under consideration for a specific application. An economic comparison is to be made at an interest rate of 10 percent and the following cost estimates have been obtained:

	Alpha	Beta
Purchase price	₹ 10,000	₹ 25,000
Estimated service life	5 years	9 years
Salvage value	0	₹ 5000
Annual operating cost	₹ 2500	₹ 1200

Determine the annual equivalent costs of the alternative systems. **(08 Marks)**

4 a. Explain MARR, IRR. **(03 Marks)**

b. A ₹ 1000 utility bond with 14 years remaining before maturity can be now purchased for ₹ 760. It pays interest of ₹ 20 each 6 month period. What rate of return is earned by purchasing the bond at the current market plus a brokerage charge of ₹ 20? **(08 Marks)**

c. Explain the causes of depreciation with example. **(09 Marks)**

PART – B

5 a. Explain : (i) Prime cost (ii) First cost (iii) Sunk cost (iv) Life cycle cost **(06 Marks)**

b. A small firm is producing 1000 pens per day. The cost of direct material is ₹ 1600 and that of direct labour is ₹ 2000. Factory overheads chargeable to it are ₹ 2500. If the selling on cost is 40% of the factory cost, what must be the selling price of each pen to realize a profit of 20 percent of the selling price? **(07 Marks)**

c. The market price of a drilling machine is ₹ 50000 and the discount allowed to the distributors is 20 percent of the market price. The selling expenses cost is $\frac{1}{4}^{th}$ of the factory cost. If the material cost, labour cost and factory overheads charges are in the of 1 : 4 : 2, what profit is made by the factory on each drilling machine, if the material cost is ₹ 4000? Other overheads may be neglected. **(07 Marks)**

6 a. Explain the relation between balance sheet and profit and loss account. **(04 Marks)**

b. The company xyz having certain reserves and surplus has the following details on 31st March, 2013.

Dividend payable – ₹ 72000	Debtors – ₹ 1,60,000
Bank balance – ₹ 10000	Bills payable – ₹ 20,000
Equity share – ₹ 200000	Plant and equipment - ₹ 80000
Provision for tax – ₹ 40000	Bills receivable – ₹ 20000
Stock – ₹ 77,000	Creditors – ₹ 55,000
8% preferred share – ₹ 1,35,000	General reseve – ₹ 40000
Land and building – ₹ 2,00,000	Cash in hand – ₹ 15000

Prepare balance sheet as on 31st March, 2013. **(10 Marks)**

c. Explain the system of book keeping, journal and ledger. **(06 Marks)**

7 a. Explain in detail types of finanacial ratio analysis. **(10 Marks)**

b. The company has an inventory of ₹ 180000 debtors of ₹ 115000 and an inventory turnover of 6. The gross profit margin of the company is 10 percent and its credit sales are 20 percent of the total sales. Calculate the average collection period. (Assume a 360 day year). **(05 Marks)**

c. A company has a net profit after taxes ₹ 120000 and pays a cash dividend of ₹ 48000 on it 36000 shares outstanding at a time when the share is selling for ₹ 12. What is the yield and the dividend payout? **(05 Marks)**

8 a. Briefly explain the objectives of profit planning. **(05 Marks)**

b. Explain essential of successful of budgeting. **(05 Marks)**

c. Prepare a purchase budget in quantity and rupees from the following particulars when the estimated price / kg is A – ₹ 3, B – ₹ 4, C – ₹ 5, D – ₹ 6. **(10 Marks)**

Material	Estimated consumption of material in kgs
A	150000
B	175000
C	75000
D	300000

Material	Stock at the beginning	Stock at the end estimated
A	40000	20000
B	50000	25000
C	20000	5000
D	60000	50000

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