10ME71

Seventh Semester B.E. Degree Examination, Dec.2014/Jan.2015
Engineering Economics

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, selecting atleast TWO questions from each part.*
2. Use of discrete interest factor table is permitted.

PART – A

1 a. Explain Law of Return. **(06 Marks)**

b. Deduce an expression for uniform series capital recovery factor. with the necessary cash flow diagram. Firstly derive $F = P(Hi)^n$ and then proceed. **(08 Marks)**

c. Assume that you sold a property today for Rs.242100 and that you had purchased the property 4 years ago with Rs.2,00,000 withdrawn from your saving account. During the 4 year period your savings would have earned 6% compounded quarterly. For a comparison of the investments, calculate the nominal interest rate received from your property purchase. **(06 Marks)**

2 a. Explain Pay back comparision method. **(04 Marks)**

b. A newly developed electric car will cost 21000 to purchase. Operating and maintenance costs, including home charging of the batteries, are estimated to be Rs.350 for the first year with annual increase there after of Rs.50 per year. Salvage value after 5 years is estimated to be Rs.6500. A new gasoline runabout will cost Rs.16000 and will average 30 miles per gallon. Gasoline costs Rs.1.26 per gallon is expected to increase at a rate of Rs.0.05 per year each of the next 4 years maintenance costs are estimated to be Rs.300 per year including warranty coverage. Salvage value is estimated to be Rs.1500 after 5 years of service. If the vehicles are expected to be driven for 20,000 miles per year, determine which option will have the lower cost over 5 years. Use present worth analysis with a 10% rate of interest. **(10 Marks)**

c. A small company purchased now for 23000 will lose 1200 each year the first 4 years. An additional 8000 investment in the company during the fourth year will result in a profit 5500 each year from the 5^{th} year through the 15^{th} year. At the end of 15 years. The company can be sold for Rs.33,000 MARR = 12%. **(06 Marks)**

3 a. Explain the situations for EAC and EAW comparisons. **(04 Marks)**

b. A city maintenance crew has had experience with a conventional back hoe that suggests that its service life is 6 years. A newly designed machine costs 50% more than the conventional machine but is quieter in operation, which will make it more adoptable to residential neighbor hoods. Both machines will have about the same operating costs, and salvage costs are expected to be negligible. What will be the service life of the new backhoe have to be to make its cost comparable to that of the conventional machine at i = 10%? **(08 Marks)**

c. A sheltered workshop requires a lift truck to handle pallets for a new contract. A lift truck can be purchased for Rs.270000. Annual insurance costs are 3% of the purchase price, payable on the first of each year. An equivalent truck can be rented Rs.15000 per month payable at the end of each month. Operating costs are same for both alternatives. For what minimum number of months must a purchased truck be used on the contract to make purchasing more attractive than leasing? Interest is 12% compounded monthly. Assume that the purchased truck has no salvage value. **(08 Marks)**

4 a. List and discuss the causes for depreciation. **(04 Marks)**

b. An automobile company is planning to buy a robot for its forging unit. It has identified two different companies for the supply of the robot. The details of cost and incremental revenue of using robots are summarized in the following table :

	Brand	
	Speedex	Giant
Initial cost (Rs.)	5,00,000	9,00,000
Annual incremental revenue (Rs.)	80,000	2,50,000
Life (yrs)	8	8
Salvage value (Rs.)	40,000	60,000

The MARR for the company is 12%. Suggest the best brand of robot to the company based on the ROR method. **(10 Marks)**

c. A local transport company wants to purchase a Volvo heavy duty truck for 35 lakhs. The company assures that the truck can run 15 lakh kilometers during its 10 years of operation. The salvage value of life period is Rs.8 lakhs. If the truck has already run for this year of operation 10 lakh kilometers, find the depreciation of the truck at this period. **(06 Marks)**

PART – B

5 a. Differentiate between estimation and costing. **(04 Marks)**

b. The expenditure incurred in manufacturing a machine is as follow:

		Amount (Rs.)			Amount (Rs.)
1.	Material consumed	5500000	9.	Direct wages	650000
2.	Indirect factory wages	800000	10.	Factory rent	60000
3.	Directors fees	300000	11.	Telephone and postage charges	15000
4.	Advertisement	100000	12.	Gas and electricity	50000
5.	Net profit	120000	13.	Office salaries	210000
6.	Depreciation on sales department car	11000	14.	Office rent	50000
7.	Printing and stationary	2500	15.	Showroom rent	150000
8.	Depreciation of plant	45000	16.	Salesman's commission	26500
			17.	Sales departments car expenses	15000

Determine: i) Direct cost; ii) Factory cost; iii) Total cost of production; iv) Cost of sales; v) Selling price. **(09 Marks)**

c. The catalogue price of a washing machine is Rs.9000 and the commission allowed to the proprietor of the showroom is 20%. The administrative and the selling expenses are 60% of the factory cost and material cost, labour cost and factory overheads are in the ratio of 2:3:1. If the cost of the labour on the manufacture of machine is Rs.1650, determine the profit on each washing machine. **(07 Marks)**

6 a. Differentiate between debentures and shares. **(04 Marks)**

b. The following is the trial balance of Mr. Ratan associates for the year ending 31st March 2014, prepare trading accounts profit and loss account and balance sheet: **(16 Marks)**

Particulars	Dr	Cr
Sales		215000
Purchase	135500	
Sales return	3000	
Purchase return		2000
Sundry debtors	30,500	
Sundry creditors		20,600
Opening stock	20400	
Salaries and wages	27,500	
Furniture	6600	
Repairs to shop	3200	
Postage and telegrams	2800	
Power and electricity	500	
Trade expenses	1200	
Rent and taxes	4800	
Bad debts	750	
Fixed deposit in bank	13500	
Interest on deposit		750
Insurance	600	
Pre-paid insurance	200	
Cash in hand	550	
Bank balance	2300	
Outstanding salaries		2200
Depreciation on furniture	1000	
Drawings	4000	
Capital		18350
	258900	258900

Closing stock was valued at Rs.19500

7 a. Make an assessment of comparative position of the firms A, B and C after taking the following data. Calculate the relevant ratio and comment on it: **(10 Marks)**

Particulars	Firm A	Firm B	Firm C
Avg inventory	10,00,000	15,00,000	20,00,000
Sales	66,00,000	83,59,000	89,60,000
Cost of goods sold	60,00,000	75,00,000	80,00,000
Expenses of managements	5,00,000	7,60,000	10,00,000
Receivables	13,20,000	24,97,500	35,84,000

b. Briefly explain the following ratios:
i) Leverage ratio; ii) Activity ratio; iii) Profitability ratios. **(10 Marks)**

8 a. Briefly explain Bench marking of manufacturing operation. **(05 Marks)**

b. A manufacturing company has a production capacity of 20,000 units of product A. The expenses for the production of 10,000 units for a period is as follows:

Particulars	Cost/unit Rs.
Materials	40
Wages	10
VOH	10
Manufacturing expenses (40% fixed)	10
Administrative (all fixed)	5
Selling and distribution expenses (50% fixed)	5
Profit	20
Selling	100

Prepare a flexible budget to show 70 and 100% level of activity. It is expected that the present unit selling price will remain constant up to 60% beyond which 5% reduction is contemplated up to 100% level of activity. Also give your opinion an which level of activity should be selected. **(15 Marks)**

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