Q. Code:444328

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B.E./B.TECH. DEGREE EXAMINATION, MAY 2024

Eighth Semester

ME16801-ENGINEERING ECONOMICS

(Mechanical Engineering)

(Regulation 2016)

Time: Three Hours **Maximum : 100 Marks**

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. How is breakeven point determined and what information are obtained from break even chart?

2. Differentiate engineering efficiency and economic efficiency.

3. Define the term cash flow diagram? Also justify in what way the cash flow diagram is useful.

4. What is sinking fund factor?

5. Differentiate revenue and cost dominated cash flow diagram in present worth method.

6. State the application of annual equivalent method.

7. List down the techniques for comparing worthiness of the project.

8. What is meant by challenger and defender?

9. Brief about inflation adjusted decisions.

10. What is meant by sinking fund method depreciation?

PART B - (5 X16 = 80 Marks)

11. (a) Consider the following data of a company for the year 1998. **(16)**

Sales = Rs. 2,40,000

Fixed cost = Rs. 50,000

Variable cost = Rs. 75,000

Find the following:

(a) Contribution

(b) Profit

(c) BEP

(d) Margin of safety

(OR)

(b) Define the law of demand and elasticity of demand. Explain the factors that affect the price elasticity of demand. **(16)**

12. (a) (i) A person wishes to have a future sum of Rs. 1,20,000 for his son's education after 10 years from now. What is the single-payment that he should deposit now so that he gets the desired amount after 10 years? The bank gives 15% interest rate compounded annually. **(8)**

(ii) Compute the present value of Rs. 1500 receivable 6 years hence if the rate of discount is 10 percent. **(8)**

(OR)

(b) A company is planning to expand its business after 5 years from now. The expected money required for the expansion programme is Rs. 5,00,00,000. The company can invest Rs. 50,00,000 at the end of every year for the next five years. If the assured rate of return of investment is 18% for the company, check whether the accumulated sum in the account would be sufficient to meet the fund for the expansion programme. If not, find the difference in amounts for which the company should make some other arrangement after 5 years. **(16)**

13. (a) A Company provides a car to its Chief Executive. The owner of the Company is concerned about the increasing cost of petrol. The cost per litre of petrol for the first year of operation is Rs.21. He feels that cost of petrol will be increasing by Re. 1 every year. His experience with the company car indicates that it averages 9 km per litre of petrol. The executive expects to drive an average of 20,000 km each year for the next 4 years. What is the annual equivalent cost of fuel over this period of time? If he is offered similar service with the same quality on rental basis at Rs 60,000 per year, should the owner continue to provide **(16)**

company car to his executive or alternatively provide a rental car to his executive? Assume i=18%. If the rental car is preferred ,then the company car will find some other use within the company

(OR)

(b) Novel investments Ltd accepts Rs. 10,000 at the end of every year for 20 years and pays the investor Rs.8,00,000 at the end of the 20th year. Innovative Investments Ltd accepts Rs. 10,000 at the end of every year for 20 years and pays the investor Rs.15,00,000 at the end of the 25th year. Which is the best investment alternative? Use present worth base with **i = 12% .** **(16)**

14. (a) The following table gives the operation cost, maintenance cost and salvage value at the end of every year of a machine whose purchase value is Rs. 25,000. Find the economic life of the machine assuming interest rate of 12%. **(16)**

End of year (n)	*Operation cost*	*Maintenance cost*	*Salvage value*
1	2,000	200	10,000
2	3,000	300	9,000
3	4,000	400	8,000
4	5,000	500	7,000
5	6,000	600	6,000
6	7,000	700	5,000
7	8,000	800	4,000
8	9,000	900	3,000
9	10,000	1,000	2,000
10	11,000	1,100	1,000

(OR)

(b) A 20-year-old steel building must either be reinforced or replaced. Reinforcement would cost Rs. 8,60,000 and would make the building adequate for an additional seven years of service. If it is reinforced, it is estimated that its net salvage value would be Rs. 5,00,000 at the time it is retired from service. The new restressed concrete would cost Rs. 18,00,000 and would meet the foreseeable requirements of the next 30 years. Such a building would have no salvage value. It is estimated that the annual maintenance cost of the reinforcement would exceed that of the concrete by Rs. 1,20,000. If the building is replaced by a new prestressed concrete, the scrap value of the steel would exceed the demolition cost by Rs. 5,20,000. Assume that the money costs the **(16)**

state 12%. What would you recommend?

15. (a) (i) A company has recently purchased an overhead travelling crane for Rs. 25,50,000. Its expected life is seven years and the salvage value at the end of the life of the overhead travelling crane is Rs. 1,20,000. find the following using the sum-of-the-years digits method of depreciation: **(8)**

(a) Depreciation at the end of the fourth year

(b) Depreciation at the end of the seventh year

(c) Book value at the end of the fifth year

(d) Book value at the end of the eighth year

(ii) A company has purchased a bus for its officers for Rs. 15,00,000. The expected life of the bus is eight years. The salvage value of the bus at the end of its life is Rs. 3,50,000. Find the following using the sinking fund method of depreciation: **(8)**

(a) Depreciation at the end of the third and fifth year

(b) Book value at the end of the second year and sixth year

(OR)

(b) (i) The Alpha Drug Company has just purchased a capsulating machine for Rs. 20,00,000. The plant engineer estimates that the machine has a useful life of five years and a salvage value of Rs. 25,000 at the end of its useful life. Compute the depreciation schedule for the machine by each of the following depreciation methods: **(8)**

(a) Straight line method of depreciation

(b) Sum-of-the-years digits method of depreciation

(c) Double declining balance method of depreciation

(ii) A company has purchased a Xerox machine for Rs. 2,00,000. The salvage value of the machine at the end of its useful life would be insignificant. The maximum number of copies that can be taken during its lifetime is 1,00,00,000. During the fourth year of its operation, the number of copies taken is 9,00,000. Find the depreciation for the fourth year of operation of the Xerox machine using the service output method of depreciation. **(8)**

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