B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Seventh Semester

Mechanical and Automation Engineering

20MUPE708 - ENGINEERING ECONOMIC ANALYSIS

Regulations - 2020

(Use of Interest Tables is permitted)

Duration: 3 Hours   Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO

1. The profit region in a break-even chart implies — 1, K1, CO1
   (a) Total revenues are equal to total costs   (c) Profit made by the company
   (b) Total revenues are greater than the total costs   (d) No profit and No loss situation

2. The increase or decrease in the cost of producing one more unit or serving one more customer is called as — 1, K1, CO1
   (a) Marginal cost   (b) Marginal revenue   (c) Incremental cost   (d) Decrement cost

3. The law states that all other things being equal, the quantity bought of a good or service is a function of price, is referred to as — 1, K1, CO1
   (a) Law of Demand   (c) Law of Demand and Supply
   (b) Law of Supply   (d) None of the above

4. The objective of process planning/process modification is to identify — 1, K1, CO1
   (a) The most economical sequence of operations to produce a part
   (b) To reduce overall production cost
   (c) To effectively utilize the available resources
   (d) To improve quality of the part produced

5. Value can be defined as the combination of _____ which ensures the ultimate economy and satisfaction of the customer — 1, K1, CO2
   (a) Efficiency, quality, service and price   (c) Economy, quality, service and price
   (b) Efficiency, quality, service and size   (d) Efficiency, material, service and price

6. A father on the day his son is born, wishes to deposit an amount that would provide withdrawals of Rs 20000 on each of the sons 18th, 19th, 20th and 21st birthdays. At interest of 12% per year, the amount to be deposited will be — 1, K2, CO2
   (a) Rs 8385   (b) Rs 8845   (c) Rs 9035   (d) Rs 10025

7. A manufacturer of TV buys TV cabinet at Rs. 500 each. In case the company makes it within the factory, the fixed and variable costs would be Rs. 4,00,000 and Rs. 300 per cabinet respectively. What is the break even quantity? — 1, K2, CO2
   (a) 1000 units   (b) 1500 units   (c) 2000 units   (d) 2500 units

8. Summation of the labour, material, overhead and all other elements of cost required to produce an item or provide a service compared to a base is called as — 1, K1, CO2
   (a) Exchange value   (b) Cost value   (c) Use value   (d) Esteem value

9. When the alternatives have identical cost, as per present worth analysis technique the focus should be on _____ — 1, K1, CO3
   (a) Maximizing present worth (benefit)   (c) Maximizing present worth (cost – benefits)
   (b) Maximizing present worth (cost)   (d) None of the above

10. What is present worth of the cost of equipment whose current value is Rs. 1600, with service life of 10 years and salvage value of Rs. 325? Assume minimum attractive rate of return (MARR) is 7%. — 1, K2, CO3
    (a) 1435   (b) 1765   (c) 1275   (d) Insufficient data

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13192**

11. A machine has an initial cost of Rs 40,000 with an annual operating and maintenance (O&M) cost of Rs. 30,000 and a salvage value of Rs. 5,000 after its 5-year. If MARR is assumed to be 15 %, the present worth of cost will be _____.   *1   K2   CO3*
(a) 40000   (b) 70000   (c) 138075   (d) 190370

12. Increase in non-current liability and Decrease in net current asset is called as   *1   K1   CO3*
(a) Cash Outflow   (b) Cash Inflow   (c) Economic life of an asset   (d) None of the above

13. The process of becoming an equipment /asset out date is known as   *1   K1   CO4*
(a) Physical deterioration   (b) Obsolescence   (c) Depletion   (d) Amortization

14. Preventive maintenance is used to ensure the breakdowns are   *1   K1   CO4*
(a) Eliminated   (b) reduced   (c) less costly   (d) cannot happen

15. Which of the following would not typically be a consideration in the equipment replacement question?   *1   K1   CO4*
(a) Forecasts of future demand   (c) The cost of the replacement equipment
(b) Expertise workers had on the old equipment (d) The cost to maintain the old equipment

16. 4 years ago a pump was purchased for Rs. 60,000 with annual operating cost of Rs. 32,000. The pump is expected to work satisfactorily for 6 additional years, after which it will have negligible salvage value. There is an opportunity to purchase a new pump for Rs. 85,000 with life of 6 years, negligible salvage value at the end of its life, and an annual operating cost of Rs. 14,000. If the new pump is purchased, the old pump will be sold for Rs. 16,000. Using 6 years study period and interest rate of 12%, it is better to   *1   K2   CO4*
(a) Continue with existing pump   (b) It can't decided
(b) Replace the existing pump with new pump   (d) None of the above

17. Depreciation arises because of   *1   K1   CO5*
(a) Fall in the market value of an asset   (c) fall in the value of money
(b) Physical wear and tear   (d) None of them

18. Loss on sale of plant and machinery should be written off against   *1   K1   CO5*
(a) Share premium (b) Depreciation fund account (c) sale account (d) profit & loss account

19. Inflation has   *1   K1   CO5*
(a) Discounting effect   (b) Compounding effect
(c) Both (a) and (b)   (d) None of the above

20. The books value of an asset is obtained by deducting depreciation from its   *1   K1   CO5*
(a) Market Value   (b) Scrap value   (c) Market + Cost price   (d) Cost

PART - B (10 × 2 = 20 Marks)
Answer ALL Questions

21. List the factors consider for the economic analysis.	2	K2	CO1
22. Write the relationship between BEP and P/ V Ratio.	2	K1	CO1
23. List the advantages of Value Engineering.	2	K1	CO2
24. What is Uniform gradient series annual equivalent amount for evaluating ROI?	2	K1	CO2
25. Define future worth method of comparison.	2	K1	CO3
26. State the applications of rate of return methods.	2	K1	CO3
27. Compare the various types of Replacement problems.	2	K2	CO4
28. Recall the cost components of assets.	2	K1	CO4
29. List any two disadvantages of Break down maintenance.	2	K1	CO5
30. Mention the objectives of evaluation of public alternatives.	2	K1	CO5

PART - C (6 × 10 = 60 Marks)
Answer ALL Questions

31. a) Explain the concept and scope of engineering economics with appropriate examples.   *10   K2   CO1*
OR
b) Explain the various elements of cost with the suitable examples.   *10   K2   CO1*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13192**

32. a) Explain value engineering with suitable industrial applications.   *10 K2 CO2*

                                                   OR

    b) (i) A bank gives a loan to a company to purchase an equipment worth Rs. 10,00,000   *10 K2 CO2*
at an interest rate of 18% compounded annually. This amount should be repaid in 15 yearly equal installments. Find the installment amount that the company has to pay to the bank.
(ii) A person invests a sum of Rs. 5,000 in a bank at a nominal interest rate of 12% for 10 years. The compounding is quarterly. Find the maturity amount of the deposit after 10 years.

33. a) Alpha Industry is planning to expand its production operation. It has identified three   *10 K2 CO3*
different technologies for meeting the goal. The initial outlay and annual revenues with respect to each of the technologies are summarized in Table. Suggest the best technology which is to be implemented based on the present worth method of comparison assuming 20% interest rate, compounded annually.

	Initial outlay (Rs.)	Annual revenue (Rs.)	Life (years)
Technology 1	12,00,000	4,00,000	10
Technology 2	20,00,000	6,00,000	10
Technology 3	18,00,000	5,00,000	10

                                                   OR

    b) Summarize the different types of rate of return methods in engineering decision   *10 K2 CO3*
making.

34. a) Discuss and demonstrate the different types of maintenance methods.   *10 K3 CO4*

                                                   OR

    b) An ABC company is considering replacement of equipment whose first cost is Rs   *10 K3 CO4*
1750 and the scrap value is negligible at any year. Based on the experience is found that the maintenance cost is zero during the first year and it increases by Rs 100 when the equipment should be replaced if interest rate is assumed to 12%.

35. a) Discuss the various methods of Depreciation with suitable examples.   *10 K3 CO5*

                                                   OR

    b) A machine costs Rs. 5,00,000. Its annual operation cost during the first year is Rs.   *10 K3 CO5*
40,000 and it increases by Rs. 5,000 every year thereafter. The maintenance cost during the first year is Rs. 60,000 and it increases by Rs. 6,000 every year thereafter. The resale value of the machine is Rs. 4,00,000 at the end of the first year and it decreases by Rs. 50,000 every year thereafter. Assume an interest rate (discounting factor) of 20%.

36. a) i) Summarize the defender challenger concept in replacement.   *5 K2 CO4*

      ii) An engine lathe was purchased for Rs.20,000. Its useful life was estimated as ten   *5 K2 CO5*
years and the salvage value as Rs5000. Using diminishing balance method, calculate the depreciation ratio. Also estimate the depreciation fund at the end of two years.

                                                   OR

    b) i) Outline the objectives of risk assessment and management.   *5 K2 CO4*

      ii) Explain in detail the (a) causes of inflation and (b) effect of inflation.   *5 K2 CO5*