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Question Paper Code : 59103

B.E.(Part-Time) DEGREE EXAMINATION, MAY/JUNE 2014.

Seventh Semester

Mechanical Engineering

PTMG 2451 — ENGINEERING ECONOMICS AND COST ANALYSIS

(Common to 080120038 – Engineering Economics and Finance for Sixth Semester
Mechanical Engineering and Automobile Engineering)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Use of Interest Table is allowed

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the economic goals.
2. Mention the situations deserving elementary economic analysis.
3. List any two aims of value engineering.
4. A person deposits a sum of Rs.20,000 at the interest rate of 18% compounded annually for 10 years. Find the maturity value after 10 years.
5. Mention the concept of “Rate of return” method.
6. State the basic idea of “present worth method” analysis.
7. Define economic life of an equipment.
8. What is meant by challenger and defender?
9. Define depreciation.
10. Mention the procedure to adjust inflation.

PART B — (5 × 16 = 80 marks)

11. (a) (i) List the ways of improving productivity (i.e. economic efficiency)?(8)
(ii) Suguna Associates has the following details: (8)

Fixed cost = Rs.20,00,000

Variable cost per unit = Rs. 100

Selling price per unit = Rs.200

Find

- (1) The break-even sales quantity (4)
(2) The break-even sales. (4)

Or

- (b) (i) Give elaborately the procedure adopted to arrive at the “selling price” of a product. (8)
(ii) Two alternatives are under consideration for a tapered fastening pin. Either design will serve the purpose and will involve the same material and manufacturing cost except for the lathe and grinder operations.

Design A will require 16 hours of lathe time and 4.5 hours of grinder time per 1,000 units. Design B will require 7 hours of lathe time and 12 hours of grinder time per 1,000 units. The operating cost of the lathe including labour is Rs.200 per hour. The operating cost of the grinder including labour is Rs.150 per hour. Which design should be adopted if 1,00,000 units are required per year. (8)

12. (a) (i) Briefly mention the various criteria for make or buy decision. (8)
(ii) A person wishes to have a future sum of Rs.1,00,000 for his son's education after 10 years from now. What is the single payment that he should deposit now so that he should deposit now so that he gets the desired amount after 10 years? The bank gives 15% interest rate compounded annually. (8)

Or

- (b) (i) What are the basic steps of value engineering? (8)
(ii) A company wants to set up a reserve which will help the company to have an annual equivalent amount Rs.10,00,000 for the next 20 years towards its employees welfare measures. The reserve is assumed to grow at the rate of 15% annually. Find the single-payment that must be made now as the reserve amount. (8)

13. (a) Lakshmi Industry is planning to expand its production operation. It has identified three different technologies for meeting the goal. The initial outlay and annual revenues with respect to each of the technologies are summarized in Table 1. Suggest the best technology which is to be implemented based on the present worth method of comparison assuming 20% interest rate, compounded annually. (16)

Table 1

	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) A company is planning to purchase an advanced machining center. Three original manufacturers have responded to its tender whose particulars are tabulated as follows:

Manufacturer	Down payment (Rs.)	Yearly equal installment (Rs.)	No. of installments
1	5,00,000	2,00,000	15
2	4,00,000	3,00,000	15
3	6,00,000	1,50,000	15

Determine the best alternative based on the annual equivalent method by assuming $i=20%$, compounded annually. (16)

14. (a) (i) A firm is considering the replacement of an equipment, whose first cost is Rs.4,000 and scrap value is negligible at the end of any year. Based on experience, it was found that the maintenance cost is zero during the first year and it increases by Rs.200 every year thereafter. When should the equipment be replaced if $i=0%$? (8)
- (ii) Distinguish between breakdown maintenance and preventive maintenance. (8)

Or

- (b) (i) Two years ago, a machine was purchased at a cost of Rs.2,00,000 to be useful for eight years. Its salvage value at the end of its life is Rs.25,000. The annual maintenance cost is Rs.25,000. The market value of the present machine is Rs.1,20,000. Now, a new machine to cater to the need of the present machine is available at Rs. 1,50,000 to be useful for six years. Its annual maintenance cost is Rs.14,000. The salvage value of the new machine is Rs.20,000. Using an interest rate of 12%, find whether it is worth replacing the present machine with the new machine. (8)
- (ii) Discuss the reasons for equipment replacement. (8)

15. (a) (i) A company has purchased an equipment whose first cost is Rs.1,00,000 with an estimated life of eight years. The estimated salvage value at the end of its lifetime is Rs.20,000. Determine the depreciation charge and book value at the end of various years using the straight line method of depreciation. (8)
- (ii) Distinguish between declining balance method of depreciation and double declining balance method of depreciation. (8)

Or

- (b) (i) Two mutually exclusive projects are being considered for investment. Project A requires an initial outlay of Rs.30,00,000 with net receipts estimated as Rs.9,00,000 per year for the next 5 years. Project B requires an initial outlay of Rs.60,00,000 with net receipts estimated as Rs.15,00,000 per year for the next 7 years. There is no salvage value associated with either of the projects. Using the benefit cost ratio, which project would you select? Assume an interest rate of 10%. (8)
- (ii) Discuss the impact of inflation on investment decision. (8)
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