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## Sixth Semester B.E. Degree Examination, July/August 2022 Engineering Economy

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Use of interest factor tables is permitted.

### Module-1

- 1 a. With a neat block diagram, explain the process of problem solving and decision making in engineering economics. (10 Marks)
- b. Explain the term strategy and tactics. (06 Marks)
- c. Define engineering economics. (04 Marks)

**OR**

- 2 a. Explain the earning power of money from lender's viewpoint and borrower's view point. (08 Marks)
- b. Define Interest. Derive an expression for effective interest rate under continuous compounding. (07 Marks)
- c. What annual year end payment must be made each year to have Rs.20,000 available 5 years from now? The compound annual interest rate is 6%. (05 Marks)

### Module-2

- 3 a. Explain the "rule of 72" as applied to present worth comparisons. (04 Marks)
- b. An entrepreneur of a small machining industry would like to purchase a drilling machine. He has received 3 quotations. He has estimated the annual revenue from each machine their salvage value and life.

Machine	First Cost Rs.	Annual Revenue Rs.	Salvage Value Rs.	Life years.
1	25,000	10,000	4,000	7
2	45,000	15,000	6,500	7
3	70,000	20,000	9,000	7

Suggest the entrepreneur which machine has to be purchased if an interest rate of 14% is prevailing. (16 Marks)

**OR**

- 4 a. List and explain the conditions for present worth comparisons. (12 Marks)
- b. The details of the feasibility report of a project are shown below:  
Check the feasibility of the project based on present worth method, if  $i = 20\%$ .  
Initial cost = Rs.50,00,000/-  
Life = 20 years  
Annual equivalent revenue = Rs. 15,00,000/-  
Modernizing cost at the end of 10 years = Rs.20,00,000/-  
Salvage value = Rs.5,00,000/- (08 Marks)

**Module-3**

- 5 a. List and explain the conditions for annual worth comparison. (08 Marks)
- b. Two alternatives X and Y are under consideration. An economic comparison of the 2 alternatives has to be made at an interest rate of 10%. Determine the equivalent annual worth of the 2 alternatives and mention which alternative is preferred.

Particulars	X	Y
Initial cost, Rs.	10,000	25,000
Life, years	5	9
Salvage value Rs.	3,000	5,000
Annual operating cost, Rs.	2,500	1,200

(12 Marks)

**OR**

- 6 a. Define :
- (i) Ownership life.
  - (ii) Accounting life.
  - (iii) Economic life.
- b. A company would like to replace a machine with a new one. It has collected the details:

(06 Marks)

Details	Alternative 1	Alternative 2
First cost, Rs.	2,00,000	3,00,000
Life, years	10	10
Salvage value, Rs.	20,000	15,000
Annual cost, Rs.	40,000	35,000
Buy back price of existing machine Rs.	25,000	5,000

Suggest the best replacement option using equal annual worth method.  $i = 20\%$ .

(14 Marks)

**Module-4**

- 7 a. What is depreciation? Explain the various causes of depreciation. (08 Marks)
- b. A company has purchased an equipment whose first cost is Rs.1,00,000 with an estimated life of 8 years. The salvage value is Rs.20,000. Determine the depreciation charge and the book value at the end of each year using sum of the years digits method of depreciation.

(12 Marks)

**OR**

- 8 a. List and explain the reasons for replacement of assets. (06 Marks)
- b. The cost of the machine is Rs.6100 and its scrap value is Rs.100. The maintenance cost found from experience is as follows:

Year	1	2	3	4	5	6	7	8
Maintenance cost, Rs.	100	250	400	600	900	1200	1600	2000

When should the machine be replaced?

(14 Marks)

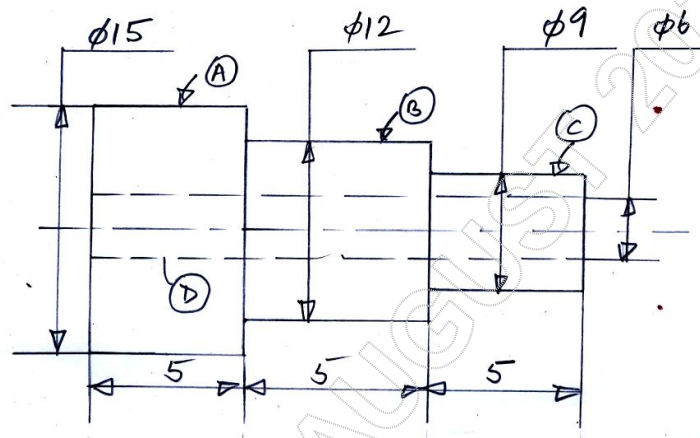
**Module-5**

- 9 a. Explain briefly the elements of cost. (06 Marks)
- b. A company is producing 1000 readymade garments per day. The direct material cost is Rs.20,000; direct labour is Rs.25,000. If the factory overhead is Rs.15,000 and selling overhead is 25% of factory cost, determine the selling price so as to realize a profit of 15% on selling price.

(14 Marks)

OR

- 10 a. Distinguish between estimation and costing. (06 Marks)
- b. A CI cone pulley is shown in Fig. Q10 (b). Taking density of CI as 7.0208 gms/cc, calculate the weight of the component. Also, what is the cost of the material if cost of CI is Rs.15/kg.



All dimensions in mm

Fig. Q10 (b)

(14 Marks)

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