Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 91890

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/ DECEMBER 2019

Seventh/Eighth Semester

Mechanical Engineering

MG 6863 – ENGINEERING ECONOMICS

(Regulations 2013)

(Common to PTMG 6863 – Engineering Economics for B.E. (Part-Time) – Seventh Semester – Mechanical Engineering – Regulations – 2014)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. What is opportunity cost ?
2. Define costing.
3. List the objectives of value engineering.
4. What is effective interest rate ?
5. What is cost dominated cash flow ?
6. What is rate of return ?
7. Define economic service life of an asset.
8. What is predictive maintenance ?
9. List the major causes of depreciation.
10. Define inflation.

PART – B **(5×13=65 Marks)**

11. a) Explain material selection. **(13)**

(OR)

b) i) Discuss scope of engineering economics. **(6)**

ii) Explain Break Even Analysis. **(7)**

12. a) Discuss value engineering procedure. (13)

(OR)

b) i) Mr. Siva is planning for a retired life. He has 10 more years of service. He likes to Deposit Rs. 8,500 at the end of the first year and thereafter wishes to deposit the amount with an annual decrease of Rs. 500 for the next 9 years at an interest rate of 15%. Find the total amount at the end of 10 years. (8)

ii) Mr. Selva deposits a sum if Rs. 10,000 in a bank at a nominal interest rate of 12% for 10 years. The compounding is quarterly. Find the maturity amount after 10 years. (5)

13. a) Find the best alternative by annual equivalent method of comparison. Assume an interest rate of 15% compounded annually.

Alternative	A1	A2	A3
Initial Cost (Rs.)	25,00,000	20,00,000	30,00,000
Annual Receipt	8,00,000	6,00,000	10,00,000
Life	10	10	10
Salvage Value	Nil	Nil	Nil

(OR)

b) A taxi firm is considering laying diesel and petrol tanks. Relevant data are as follows.
Determine the choice by future worth of comparison at 18% annual interest.

Vehicle cost	Rs. 5,00,000	Rs. 4,00,000
Fuel cost/litre	Rs. 9.00	Rs. 24.00
Mileage in km/litre	30	20
Annual Insurance	Rs. 500	Rs. 500
Premium km/year	50,000	50,000
Years of operation	3	4
Salvage value	Rs. 70,000	Rs. 1,00,000

14. a) A firm wants to replace an equipment costing Rs. 1,750 and its scrap value is negligible at any year. The maintenance cost is zero in first year and increases by Rs. 100 every year thereafter. When should the equipment be replaced if i = 12%.

(OR)

b) An electronic equipment contains 1000 resistors. When any resistor fails it is replaced. The cost of replacing a resistor individually is Rs. 7. When all the resistors are replaced at the same time the cost per resistor is Rs. 4. The percent surviving S(i) at the end of i month is as follows.

i	0	1	2	3	4	5	6
S(i)	100	90	85	65	35	15	0

Find the optimum replacement plan.

15. a) Priya Pharma Co has just purchased a capsulating machine for Rs. 10,00,000. The useful life and salvage value at the end of life are 5 years and Rs. 10,000 respectively. Compare the depreciation of the machine by straight line method and sum of the years digit method.

(OR)

b) A company in planning for employee welfare fund. It needs Rs. 1,00,00,000/- during the first year and it increases by Rs. 10,00,000/-every year thereafter for up to the end of the 5th year. The above are in terms of today's rupee value. The annual average rate of inflation is 6% for the next five years. The interest rate is 18% compounded annually. Find the single deposit to be made taking inflation into account to provide the required series of funds.

PART – C **(1×15=15 Marks)**

16. a) Consider the following cash flow of a project :

Year	0	1	2	3	4	5
Cash Flow	–10,000	4000	4500	5000	5500	6000

Find the rate of return of the project.

(OR)

b) A state government is planning a hydroelectric project for a river basin. In addition to the power, the project will provide flood control, irrigation and recreation benefits. Data on benefits and costs are as follows :

Initial cost = Rs. 400,00,000

Annual flood control savings = Rs. 15,00,000

Annual recreation benefits = Rs. 10,00,000

Life of the project = 50 years

Annual power sales = Rs. 20,00,000

Annual irrigation benefits = Rs. 25,00,000

Annual odm costs = Rs. 15,00,000

Interest rate = 12%

Check whether the project can be undertaken.
