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Question Paper Code : 72210

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Eighth Semester

Mechanical Engineering

MG 6863 — ENGINEERING ECONOMICS

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the law of supply and demand.
2. What is sunk cost?
3. Define value engineering.
4. What is effective interest rate?
5. What is future worth?
6. State the applications of rate of return method.
7. Define economic life of an asset.
8. Distinguish between challengers and defenders.
9. Define depreciation.
10. State the merits of annuity method of depreciation.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the concept and scope of engineering economics.

Or

- (b) (i) Discuss opportunity cost. (4)
- (ii) Describe process planning. (12)

12. (a) (i) Discuss make or buy decisions. (6)
 (ii) Explain value engineering procedure. (10)

Or

- (b) (i) Describe the functions and aims of value engineering. (8)
 (ii) A company has to replace an asset after 10 years at an outlay of Rs. 5,00,000/-. It plans to deposit an equal amount at the end of every year for the next 10 years at an annually compounded interest of 20%. Find the equivalent amount to be deposited at the end of every year for the next 10 years. (8)

13. (a) (i) Explain present worth method. (6)
 (ii) Data on two mutually exclusive investment options are as follows:

Alternative Cash flow in Lakhs of rupees at the end of year

	0	1	2	3	4
A	-45	20	20	20	20
B	-40	18	18	18	18

Find the best option taking 18% interest by future worth method. (10)

Or

- (b) A firm is diversifying into a new business. The life of the business is 10 years without any salvage value at the end of life. The initial outlay required is Rs. 20,00,000/- and the annual net profit estimated is Rs. 3,50,000/-. Find the rate of return for the new business. Check whether the business is worth for a cost of capital of 12%. (16)

14. (a) (i) Explain different types of maintenance. (12)
 (ii) Differentiate between individual and group replacements. (4)

Or

- (b) Three years earlier Coimbatore Corporation purchased a 10 HP motor for pumping drinking water and its useful life was estimated as 10 years. But due to rapid development, it is unable to meet demand per water. The options available are either to augment the capacity with an additional 5 HP motor or to replace the existing 10 HP motor with a new 15 HP motor. The data on the two options are as follows.

Details of motors	Old 10 HP motor	New 5 HP motor	New 15 HP motor
Purchase cost (P) in Rs.	25,000	12,000	32,000
Life in years (n)	10	7	7
Salvage value at the end of machine life (Rs.)	1,500	800	5,000
Annual operating and maintenance cost (Rs.)	1,600	1,000	500

The current market value of the 10 HP motor is Rs. 15,000. Using an interest rate of 15% suggest the best alternative. (16)

15. (a) Two equipments are purchased each for Rs. 12,000/-. The estimated useful life is 5 years for both, the estimated scrap value for each equipment is Rs. 2,000/-. For one equipment the straight line method is used to calculate annual depreciation and for the other equipment, the reducing balance method is adopted. Compare the depreciation charges for both for all the 5 years. (16)

Or

- (b) A machine costs Rs. 5,00,000/-. Its annual operation cost during the first year is Rs. 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. Take an interest rate of 20%. Find the economic life of the asset. (16)



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Question Paper Code : 41461

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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Eighth Semester
Mechanical Engineering
MG 6863 – ENGINEERING ECONOMICS
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is engineering efficiency and economic efficiency ?
2. Differentiate marginal cost and total cost.
3. State the meaning for the term time value of money.
4. Identify any two value engineering procedures.
5. Write the formula to calculate rate of return.
6. What is the formula used to calculate present value ?
7. List any two types of maintenance costs.
8. Compare recovery and return.
9. Mention a note on straight line method of depreciation.
10. Sketch the procedure to adjust inflation.

PART – B

(5×16=80 Marks)

11. a) What is Law of demand and supply ? Draw a demand and supply curve and explain its determinants.

(OR)

- b) Enumerate briefly the various cost concepts. Establish the cost-output relationship in the short-run with suitable diagram.



12. a) As an engineer how will you calculate single payment compound amount factor ?
Illustrate your answer with examples.

(OR)

b) Explain the various types of values in value engineering with examples.

13. a) Summarize the different types of rate of return methods in engineering decision making.

(OR)

b) Draw revenue dominated cash flow and costs dominated cash flow of your own choice and explain its uses.

14. a) Discuss economic service life of an asset and main causes of breakdown.

(OR)

b) Illustrate annual equivalent total cost with suitable examples and state its limitations.

15. a) Elucidate the different methods of calculating depreciation.

(OR)

b) On 1st Jan. 2009, a company purchased a machine costing Rs. 5,00,000. Its estimated working life is 20 years at the end of which it will fetch Rs. 20,000. Additions are made on 1 January, 2010 and 1 July, 2011 to the value of Rs. 80,000 (scrap value Rs. 4,000) and Rs. 40,000 (Scrap value Rs. 2,000) respectively. The life of both the new machines is 20 years. Show machine a/c for first four years.



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AN

Question Paper Code : 50930

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Eighth Semester
Mechanical Engineering
MG 6863 – ENGINEERING ECONOMICS
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is Law of Supply and Demand ?
2. What is Process Planning ?
3. What is Value Engineering ?
4. What is Make or Buy decision ?
5. What is Time Value of Money ?
6. What is Capital Recovery ?
7. Write the need of studying economics for the Engineers.
8. What is Depreciation ?
9. What is Inflation ?
10. What is Budget ?



PART – B

(5×16=80 Marks)

11. a) Describe the various concepts of Engineering Economics and analyze its efficiency. (16)
- (OR)
- b) Write in detail Economics Analysis for any Engineering Project or Process and write the process of material selection for product design. (16)
12. a) Explain the procedural steps of Value Engineering with a suitable example. (16)
- (OR)
- b) Discuss the equal payment series, capital recovery factor, uniform gradient series and annual equivalent factor with suitable examples. (16)
13. a) Compare and contrast the present worth method with future worth method. (16)
- (OR)
- b) With suitable example compare the Annual Equivalent Method with Rate of Return Method. (16)
14. a) Write an essay about Replacement and Maintenance analysis. (16)
- (OR)
- b) Write in detail the mode of recovery of capital and return and explain the simple probabilistic model for items which fail completely. (16)
15. a) Discuss the different methods of calculation of Depreciation. (16)
- (OR)
- b) Explain the method of evaluation of public alternatives with special reference to inflation adjusted decision. (16)

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Question Paper Code : 20859

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Eighth Semester

Mechanical Engineering

MG 6863 — ENGINEERING ECONOMICS

(Regulations 2013)

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

Time : Three hours

Maximum : 100 marks

(Use of present value tables permitted)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is law of supply?
2. What is a break even chart?
3. What do you mean by Value Analysis?
4. What is effective interest rate?
5. What do you mean by present worth method?
6. What is Cost dominated cash flow?
7. List any two disadvantages of breakdown maintenance.
8. What is called availability in maintenance engineering?
9. What is depreciation?
10. What is inflation?

PART B — (5 × 16 = 80 marks)

11. (a) Bring out the significance of choosing the material for product design selection.

Or

- (b) With examples explain the various elements of the cost.

12. (a) A company has extra capacity that can be used to produce a sophisticated fixture which it has been buying for Rs. 900 each. If the company makes the fixtures, it will incur materials cost of Rs. 300 per unit, labour costs of Rs. 250 per unit, and variable overhead costs of Rs. 100 per unit. The annual fixed cost associated with the unused capacity is Rs. 10,00,000. Demand over the next year is estimated at 5,000 units. Would it be profitable for the company to make the fixtures?

Or

- (b) Explain the concept of time value of money. Also give examples for application of time value of money principle.
13. (a) Beta 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 below. Suggest the best technology which is to be implemented based on the present worth method of comparison assuming 20% interest rate, compounded annually.

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

Or

- (b) With illustration explain the concept of future worth method using revenue dominated cash flow diagram.
14. (a) The data on the running cost per year and resale price of equipment 'A', whose purchase price is Rs. 2,00,000, are as follows:

Year	1	2	3	4	5	6	7
Running Cost (Rs.)	30,000	38,000	46,000	58,000	72,000	90,000	1,10,000
Resale Value (Rs.)	1,00,000	50,000	25,000	12,000	8,000	8,000	8,000

What is the optimum period of replacement?

Or

- (b) With an illustration explain the need and the use of simple probabilistic model for items which fail completely.

15. (a) Explain the procedure to adjust inflation in calculation depreciation.

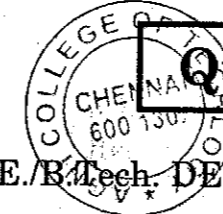
Or

- (b) With an example explain the straight line method of depreciation. Also list the advantages of using straight line method of depreciation.



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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 of 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.