

# VTU B.E/B.TECH QUESTION PAPER SET

## CBCS SEMESTER V

# ENERGY AND ENVIRONMENT

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Question Papers



Notes



Syllabus



Exams/Timetable



News



Results

## CBCS Scheme

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15ME562

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018

## Energy and Environment

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing one full question from each module.*

Module-1

- 1 a. Explain briefly world energy scenario with respect to production and consumption using relevant statistics. (08 Marks)
- b. Elaborate the effect of various social and environmental aspects on India's energy development. (08 Marks)

OR

- 2 a. Discuss briefly the various key energy trends in India. (12 Marks)
- b. List and explain various forms of energy in a brief manner. (04 Marks)

Module-2

- 3 a. List the different types of thermal energy storage systems. Explain any two of them. (08 Marks)
- b. Elaborate the different phases involved in detailed energy audit methodology. (08 Marks)

OR

- 4 a. A power plant of 210 MW installed capacity has the following particulars:  
Capital cost = Rs.18000/KW installed  
Interest and depreciation = 12%  
Annual load factor = 60%  
Annual capacity factor = 54%  
Annual running charges = Rs.2 × 10<sup>8</sup>  
Energy consumed by auxiliaries = 6%.  
Calculate the cost of power generation per kWh. (10 Marks)
- b. What are the general characteristics of capital investments? (06 Marks)

Module-3

- 5 a. Identify the need for public awareness on environment management. Discuss the effort of important institutions and people in environment management. (10 Marks)
- b. Discuss how carbon is utilized in the ecosystem with the help of a simple flow diagram. (06 Marks)

OR

- 6 a. Define ecosystem. Explain the different types of forest ecosystems in India. (10 Marks)
- b. Explain the following terms:  
i) Food chain  
ii) Food web  
iii) Ecological pyramid (06 Marks)

**Module-4**

- 7 a. Explain the main sources and effects of air pollution. (10 Marks)  
b. Discuss the role of an individual in prevention of pollution. (06 Marks)

OR

- 8 a. Discuss strategy and techniques involved in solid waste management. (10 Marks)  
b. Illustrate a case study related to environmental pollution in detail. (06 Marks)

**Module-5**

- 9 a. Write a short note on Global warming. (06 Marks)  
b. What is the need for wasteland reclamation? Explain the methods for reclaiming wasteland. (10 Marks)

OR

- 10 a. What are the objectives of Water (prevention and control of pollution) Act? Explain its salient features and penalties for violation. (10 Marks)  
b. Explain the role of environment impact Assessment (EIA) in Enforcing Environmental Legislation. (06 Marks)

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## CBCS SCHEME

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15ME562

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019

## Energy and Environment

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List and explain the different forms of energy. (06 Marks)  
b. Explain briefly the key energy trends in India. (10 Marks)

OR

- 2 a. Discuss briefly the demand and consumption of coal in India. (06 Marks)  
b. Explain briefly the factors affecting India's energy development. (10 Marks)

Module-2

- 3 a. Explain the following with one example : (08 Marks)  
i) Sensible heat thermal storage system ii) Latent heat thermal storage system.  
b. Discuss the energy conservation schemes. (08 Marks)

OR

- 4 a. What is Energy audit and its objectives? (08 Marks)  
b. Discuss the steps to be followed in undertaking preliminary energy audit in an industrial company. (08 Marks)

Module-3

- 5 a. Explain with a suitable examples, multidisciplinary nature of environmental studies. (10 Marks)  
b. Discuss the need for public awareness of environment management. (06 Marks)

OR

- 6 a. Explain the flow of energy through the various components of the eco system. [Producers, Consumers and Decomposers]. (08 Marks)  
b. Explain the concept of ecological pyramids and food chains. (08 Marks)

Module-4

- 7 a. Discuss the major sources and effects of air pollution. (08 Marks)  
b. Define Noise pollution. List the major sources and effects of noise pollution. (08 Marks)

OR

- 8 a. With a neat diagram, explain Municipal Solid Waste [MSW] Processing unit. (10 Marks)  
b. Discuss the role of individual in pollution prevention. (06 Marks)

Module-5

- 9 a. Explain the phenomenon of global warming, factor contributing global warming and its effect. (10 Marks)  
b. What is Acid rain? Explain the causes and effects of acid rain. (06 Marks)

OR

- 10 a. Write short notes on : (10 Marks)  
i) The water [Prevention and control of pollution] Act ii) Environment Protection Act.  
b. Explain how ozone layer depletion occurs. Discuss the impact of ozone depletion on human health. (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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15ME562

**Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020**  
**Energy and Environment**

Time: 3 hrs.

Max. Marks: 80

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

**Module-1**

- 1 a. Interpret World Energy Scenario with respect to production and consumption using relevant statistics. (08 Marks)  
 b. Outline the factors that affect India's energy development. (08 Marks)

**OR**

- 2 a. Explain the various Key energy trends in India. (10 Marks)  
 b. Explain the forms of Energy and differentiate energy and power. (06 Marks)

**Module-2**

- 3 a. List the various thermal energy storage methods. Explain the working principle of solar pond with neat sketch. (08 Marks)  
 b. A thermal power plant of 210MW capacity has the maximum load of 160MW. Its annual load factor is 0.6. The coal consumption is 1kg per kWh of Energy generated and the cost of coal is Rs. 450 per tonne. Calculate (i) The annual revenue earned if energy is sold at Rs 1 per kWh and ii) The capacity factor of the plant. (08 Marks)

**OR**

- 4 a. Define energy audit, explain the need for energy audit and mention the various phases of energy audit methodology. (08 Marks)  
 b. A company owns a premium plot. They have to decide which of several alternatives to select in trying to obtain a desirable return on their investment. After much study and calculation, they decide that the two best alternatives are as given in the following table.

	Build solar power plant	Build Hydro power plant
First cost (Rs.)	20,00,000	36,00,000
Annual property taxes (Rs.)	80,000	1,50,000
Annual Income (Rs.)	8,00,000	9,80,000
Life of land ( Years)	20	20
Salvage value (Rs.)	0	0

Evaluate the alternative based on the future worth method at  $i = 12\%$ .

(08 Marks)

**Module-3**

- 5 a. Explain the following with a neat sketch i) Food chain ii) Food Web iii) Energy pyramid or Ecological pyramid. (06 Marks)  
 b. What is an Ecosystem? Explain different types of forest ecosystem. (10 Marks)

**OR**

- 6 a. Explain grassland ecosystems and its types. (08 Marks)  
 b. Write a short notes on : i) Nitrogen cycle ecosystem ii) Oxygen cycle ecosystem iii) Desert ecosystem iv) Aquatic ecosystem. (08 Marks)

**Module-4**

- 7 a. Discuss briefly the causes, effects and control of Air Pollution. (08 Marks)  
b. Discuss briefly the causes, effects and control measures of i) Soil pollution (08 Marks)  
ii) Noise pollution iii) Thermal pollution iv) Marine pollution.

**OR**

- 8 a. Discuss Solid waste management techniques. (08 Marks)  
b. Discuss any two case studies related to pollution of environment in detail. (08 Marks)

**Module-5**

- 9 a. What is acid rain? What are its effects and write a short note on Ozone layer depletion. (08 Marks)  
b. Discuss : i) Wildlife Protection Act ii) Forest Conservation Act. (08 Marks)

**OR**

- 10 a. What are the regulations governing Water Pollution Prevention Act? (08 Marks)  
b. Explain the impact of global warming on our mother nature. (08 Marks)

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15ME562

**Fifth Semester B.E. Degree Examination, Aug./Sept.2020**  
**Energy and Environment**

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

- 1 a. Differentiate Energy and Power. List the different types of energies. (08 Marks)  
b. Discuss the demand and access to modern energy aspects with respect to key energy trends in India. (08 Marks)

OR

- 2 a. Differentiate between primary and secondary energy sources. List the various primary energy sources. (08 Marks)  
b. What are the factors affecting India's energy development? Explain any two factors. (08 Marks)

Module-2

- 3 a. Which are the different Thermal energy storage methods? (06 Marks)  
b. What is Energy Audit? Explain the methodology used in Energy Audit. (10 Marks)

OR

- 4 a. Explain the various factors which affect energy pricing. (08 Marks)  
b. What is Economic analysis of a project? What are the steps involved in economic analysis. (08 Marks)

Module-3

- 5 a. Explain the importance of Environmental education and Public awareness in the present day context. (10 Marks)  
b. Explain the concept of Ecological pyramid. (06 Marks)

OR

- 6 a. Explain the components of Environment and the impact of urbanization on them. (10 Marks)  
b. Discuss the Environmental factors affecting the performance of an aquatic ecosystem. (06 Marks)

Module-4

- 7 a. List the major air pollutants and explain their effect on human beings. (08 Marks)  
b. Explain the role of an individual in prevention of pollution. (08 Marks)

OR

- 8 a. Explain the working of any two air pollution control equipments mentioning their advantages, disadvantages and application. (08 Marks)  
b. What is Hazardous Waste? Explain disposal methods for hazardous wastes. (08 Marks)

Module-5

- 9 a. What are the causes and effects of acid rain? (06 Marks)  
b. Write short notes on :  
i) The water (Prevention and Control of Pollution) Act, 1974.  
ii) The Wildlife Protection Act 1971. (10 Marks)

OR

- 10 a. Explain the affect of nuclear hazards and accidents, with a case study. (08 Marks)  
b. Discuss the possible impact of ozone depletion and global warming on the eco system. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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17ME562

**Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020**  
**Energy and Environment**

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

**Module-1**

- 1 a. Discuss world energy scenario, with respect to production and consumption using relevant statistics. (10 Marks)
- b. Explain primary energy demand in India by fuel with sector wise comparison. (10 Marks)

**OR**

- 2 a. Outline with brief explanation the factors effects the India's energy development. (10 Marks)
- b. Explain:
- (i) The Rajiv Gandhi Grameena Vidyutikaran Yojana (RGGVY)
- (ii) Deen Dayal Upadhyana Grama Jyoti Yojana (DDUDJY)
- (iii) Energy Production in India – Coal (only) (10 Marks)

**Module-2**

- 3 a. A power plant of 200 MW installed capacity has following particulars:  
 Capital cost = Rs.16,000/KW installed  
 Interest and Depreciation = 12%  
 Annual load factor = 60%  
 Annual capacity factor = 54%  
 Annual Running Charges = Rs.200 × 10<sup>6</sup>  
 Energy consumed by power plant auxiliaries = 6%  
 Calculate the cost of power generation per KWh. (10 Marks)
- b. Explain:
- (i) Objective of Energy Management
- (ii) Audit
- (iii) Sample Report Content of Energy Audit (10 Marks)

**OR**

- 4 a. Discuss 10 steps methodology for detailed Energy Audit. (10 Marks)
- b. With a neat diagram, explain:
- (i) Hydrostorage (pumped storage)
- (ii) Fly wheel (10 Marks)

**Module-3**

- 5 a. Discuss how oxygen cycle is utilized in the eco system. (10 Marks)
- b. Discuss:
- (i) Food
- (ii) Food web
- (iii) Ecological pyramid (10 Marks)

OR

- 6 a. Discuss how carbon cycle is utilized in the eco system. (10 Marks)  
b. Described grassland eco system. What are its types? (10 Marks)

Module-4

- 7 a. Enumerate the water pollution causes and its effects. Mention control measures that can be initiated for mitigating the same. (10 Marks)  
b. Discuss Solid Waste Management Techniques (SWMT). (10 Marks)

OR

- 8 a. Discuss the role of an individuals in prevention of pollutions. (10 Marks)  
b. Elaborates the causes, effects and control measures of:  
(i) Soil pollution (10 Marks)  
(ii) Noise pollutions

Module-5

- 9 a. Discuss any two case studies related to pollution of environment in detail. (10 Marks)  
b. Explain sources of Air Pollution. (10 Marks)

OR

- 10 Write short notes on: (05 Marks)  
a. Global warming (05 Marks)  
b. Acid Rain (05 Marks)  
c. Ozone layer depletion (05 Marks)  
d. Forest Conservation Act (05 Marks)

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