

III B. Tech II Semester Regular Examinations, April/May - 2019**GREEN ENGINEERING SYSTEMS**

(Common to Mechanical Engineering, Automobile Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

PART -A

1. a) What is meant by extraterrestrial radiation? Explain. [3M]
- b) State the applications of solar pond. [2M]
- c) Distinguish between mini and micro hydel power plants? [2M]
- d) What do you mean by rotodynamic pumps? Mention the types. [2M]
- e) What is sustainable manufacturing? Explain. [3M]
- f) Write a short note on agro materials. [2M]

PART -B

2. a) Explain the working principle of Photo Voltaic cell with a neat sketch. [7M]
- b) State and explain Lambert's law. [7M]
3. a) What are the methods of storing solar energy? Explain any two methods in detail. [7M]
- b) Explain the concept and working of central power tower plant. [7M]
4. a) Discuss the combustion characteristics of a bio gas. [7M]
- b) Explain in detail various methods of extracting geothermal energy. [7M]
5. a) Discuss the working of ion exchange membrane fuel cell with a neat sketch. [7M]
- b) Explain briefly the working principle of any one type of energy efficient compressor. [7M]
6. a) Write a short note on zero waste manufacturing. [7M]
- b) Discuss the environmental impact of current manufacturing systems in detail. [7M]
7. a) Explain the process of reducing heat gain using paints. [7M]
- b) Discuss various parameters considered while planning a building for maximum comfort. [7M]

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PART -A

1. a) State the applications of solar PV cells. [2M]
- b) Discuss the available methods of storing solar energy. [3M]
- c) State the limitations of OTEC system. [2M]
- d) Discuss the advantages of variable frequency drives. [2M]
- e) What are eco-friendly materials? Explain. [3M]
- f) Explain energy management. [2M]

PART -B

2. a) State the differences between Pyrheliometer and Pyranometer. [7M]
- b) Explain the working principle of solar ponds and solar cookers. [7M]
3. a) Explain solar space heating system with neat a labeled sketch. [7M]
- b) Classify various wind types and explain each in detail. [7M]
4. a) Enumerate the differences between aerobic and anaerobic digestion. [7M]
- b) Classify the bio gas digesters and explain any one in detail. [7M]
5. a) Explain the working principle of a fuel cell with a labeled sketch. [7M]
- b) Write a short note on energy efficient lighting and control. [7M]
6. a) Discuss the benefits of green manufacturing systems in detail. [7M]
- b) Write a short note on sustainable green production systems. [7M]
7. a) State the disadvantages of rammed earth. [6M]
- b) Enumerate the environment friendly building materials with their advantages for green building. [8M]

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1. a) What is Solarimeter? Explain. [3M]
- b) Mention the advantages and disadvantages of vertical axis wind mill. [2M]
- c) State the limitations of tidal energy power systems. [2M]
- d) Classify various types of fuel cells. [2M]
- e) What is meant by zero waste manufacturing? Explain. [3M]
- f) What is green building? [2M]

PART -B

2. a) Explain the working of Flat plate collector with a neat labeled sketch. [7M]
- b) State the need for new and renewable energy resources of solar radiation. [7M]
3. a) What do you mean by passive solar space heating system? Explain. [7M]
- b) Explain the working of horizontal axis wind mill in detail. [7M]
4. a) With a neat labeled sketch explain the working of OTEC system. [7M]
- b) List out the advantages and disadvantages of geo-thermal energy over other energy forms. [7M]
5. a) What do you mean by the term “demand side management”? Explain briefly. [7M]
- b) Explain the need for energy efficient motors in various applications. [7M]
6. a) Write short notes on alternate casting and joining techniques. [7M]
- b) Name some eco-friendly materials and discuss their characteristics. [7M]
7. a) Write short notes on lime pozzolana cement. [7M]
- b) Discuss the measures to reduce industrial waste pollution. [7M]

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PART -A

1. a) State the significance of solar constant in power generation. [2M]
- b) What is a solar cooker? What are its types? [3M]
- c) What do you understand by the term 'anaerobic digestion'? [3M]
- d) What is an energy efficient system? Describe with example. [2M]
- e) State the advantages of vegetable based cutting fluids. [2M]
- f) List out the advantages of seasoning a timber. [2M]

PART -B

2. a) Differentiate between flat plate collectors and concentrating collectors. [7M]
- b) Explain the working principle of pyranometer. [7M]
3. a) With a neat labeled sketch explain the working of solar cooling plant. [7M]
- b) Explain the components and working of wind energy conversion system. [7M]
4. a) Enlist various methods of biomass energy conversion and explain any one in detail. [7M]
- b) Explain the working principle of KVIC digester. [7M]
5. a) Discuss the factors considered for selection of luminaire. [7M]
- b) Write short notes on HVAC controls. [7M]
6. a) Discuss the parameters considered while selection of recyclable and environmental friendly materials. [7M]
- b) Explain Zero Waste Manufacturing in detail. [7M]
7. a) Describe alternative roofing system to reduce heat in the buildings. [7M]
- b) Discuss the characteristics of bamboo and timber with reference to their use in construction of green buildings. [7M]

III B. Tech II Semester Regular/Supplementary Examinations, October/November - 2020
GREEN ENGINEERING SYSTEMS

(Common to Mechanical Engineering, Automobile Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. Answer **ALL** the question in **Part-A**

3. Answer any **FOUR** Questions from **Part-B**

PART -A

(14 Marks)

1. a) What is terrestrial solar radiation? [2M]
- b) Give different types of Concentrating type collectors. [2M]
- c) What are the main applications of geothermal energy? [2M]
- d) What are the precautions to be taken in the case of energy-efficient motor applications? [3M]
- e) What is the need for vegetable-based cutting fluids? [3M]
- f) Name different environment-friendly materials used in green buildings. [2M]

PART -B

(56 Marks)

2. a) Explain the construction and principle of operation of a sunshine recorder. [7M]
- b) What is a solar pond? Explain how energy stored in a solar pond with a suitable diagram? [7M]
3. a) With the help of a schematic diagram, explain a solar passive-space cooling system. [7M]
- b) What are the various characteristics of the wind? Discuss the advantages and disadvantages of horizontal and vertical axis windmills. [7M]
4. a) Explain in detail aerobic digestion and different phases and the process involved in it. [7M]
- b) Explain various methods to extract geothermal energy. [7M]
5. a) What is the role of energy-efficient compressors and pumps in energy-efficient systems? Explain. [7M]
- b) Explain why centrifugal machines offer the greatest savings when used with variable speed drives? [7M]
6. a) List the factors which involve in the selection of environmentally friendly materials in manufacturing. [7M]
- b) Explain how alternate casting and joining techniques improve efficiency? [7M]
7. a) Explain the role of sustainable methods in the planning of sites for green buildings. [7M]
- b) What are alternate sources for green buildings? Explain them. [7M]

III B. Tech II Semester Regular/Supplementary Examinations, August-2021
GREEN ENGINEERING SYSTEMS

(Common to Mechanical Engineering, Automobile Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**
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PART -A**(14 Marks)**

1. a) Enumerate the advantages of solar collectors. [2M]
- b) What is the basic principle of wind energy conversion? [2M]
- c) Define Bretz criteria. [2M]
- d) Mention the difference between biomass and biogas. [3M]
- e) Write environmentally friendly materials used in manufacturing. [3M]
- f) What are the measures to reduce heat gain in buildings? [2M]

PART -B**(56 Marks)**

2. a) What are the components of flat plate collector and explain the function of each? [7M]
- b) Explain the basic principle of PV cell and its I-V characteristics. [7M]
3. a) Describe different energy storage methods used in solar system. [7M]
- b) How wind energy systems are classified? Explain. [7M]
4. a) Explain the three basic kinds of geothermal resources. [7M]
- b) Define Anaerobic Digestion. Explain with a neat Schematic Common Circular type of Digester. [7M]
5. a) Explain the role of selection of fuels for environmentally friendly environment. [7M]
- b) Discuss about variable voltage variable frequency drives. [7M]
6. a) What is zero manufacturing? Explain. [7M]
- b) Explain the role of environment sustainable company in energy management. [7M]
7. a) What are the measures for energy saving in a green building? Explain. [7M]
- b) Explain the role of site planning in the construction of green buildings. [7M]

