

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**

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**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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**PART -A**

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]
