Roll No…….. **Total No. of Printed Pages: 2**

Total No. of Questions: [09]

B. Tech. (ECE) (Semester –6th/7th/8th)
RENEWABLE ENERGY SOURCES
Subject Code: BELE0F94
Paper ID: [OE2111314]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. What is the solar constant, and why is it important in understanding solar energy availability?
b. Difference between concentrated and flat plate solar energy collectors.
c. Name two applications of solar energy apart from electricity generation.
d. Describe the factors considered in site selection for wind energy projects.
e. Briefly outline the functioning of a biogas plant in the conversion of biomass into usable energy.
f. Describe the renewable energy sources.
g. Name the prime movers commonly used for harnessing geothermal energy.
h. Describe the process of ocean thermal electric conversion.
i. What is the potential role of nuclear fusion in the context of hydrogen energy production?
j. What are some common methods used for hydrogen production?

Section – B **(5 marks each)**

Q2. Discuss the various applications of solar energy, such as space heating, distillation, cooking, and the greenhouse effect. Explain how solar energy is utilized in each application and discuss the benefits of using solar energy in these contexts.

Q3. Explain the concept of energy balance in solar energy systems and discuss factors influencing collector efficiency. How is collector efficiency calculated, and why is it important in solar energy utilization?

Q4. Explain the process of photosynthesis and its role in biomass energy production. Discuss how biomass is converted into biogas in a biogas plant and the factors influencing biogas production efficiency.

Q5. Explain the basic principle behind wind energy conversion and the key components of a wind turbine system.

Q6. Describe the process of harnessing energy from tides and how tidal power generation systems operate.

Section – C **(10 marks each)**

Q7. Discuss various methods of solar energy storage, including thermal storage and battery-based systems. Compare their advantages, disadvantages, and suitability for different applications.

Q8. Describe the prime movers commonly used in geothermal energy systems for power generation. Discuss their working principles and advantages in converting geothermal heat into electricity.

Q9. Describe the working principle of magneto hydrodynamic power generation and its potential as a clean energy source. Discuss the advantages and challenges of magneto hydrodynamic power compared to traditional methods.