

# CBCS SCHEME

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18EE731

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Solar and Wind Energy

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Briefly explain the importance of Non – Conventional Energy Sources. (06 Marks)  
b. Explain the classification of Energy Sources. (08 Marks)  
c. What are the types of Energy Audit and explain? (06 Marks)

OR

- 2 a. With a neat diagram, explain Latent heat storage in Thermal Energy System. (06 Marks)  
b. Explain Extraterrestrial and Terrestrial radiations with a neat diagram. (08 Marks)  
c. Explain Spectral Power distribution of Solar radiation with neat diagram. (06 Marks)

### Module-2

- 3 a. Define i) Angle of latitude ii) Declination iii) Hour angle. (06 Marks)  
b. What is meant by Pyranometer and explain the types of Pyranometer. (08 Marks)  
c. Briefly explain about Solar Radiation data. (06 Marks)

OR

- 4 a. Explain a typical liquid flat – plate solar collector with a neat diagram. (06 Marks)  
b. With a neat diagram, explain Solar industrial heating systems. (08 Marks)  
c. Explain Lithium Bromide water absorption cooling system, with a neat diagram. (06 Marks)

### Module-3

- 5 a. Explain Solar cell I – V characteristics. (06 Marks)  
b. Explain Maximizing the Solar PV at pot and load matching. (06 Marks)  
c. With a neat diagram, explain Solar PV module. (08 Marks)

OR

- 6 a. Explain Maximum Power Point tracker with a neat diagram and draw I-V characteristics. (08 Marks)  
b. With the help of circuit diagram, explain Stand – Alone Solar PV system. (06 Marks)  
c. What are the Solar PV applications briefly explain? (06 Marks)

### Module-4

- 7 a. Explain the considerations for the site selection of wind power generation. (08 Marks)  
b. Derive the expression for power developed due to wind. (06 Marks)  
c. Write a note on The Nature of the wind. (06 Marks)

OR

- 8 a. Derive the expression for Forces on the blades and thrust on turbines due to wind. (08 Marks)  
b. What are the benefits and problems of wind energy? (06 Marks)  
c. Briefly explain lift and drag type wind energy conversion. (06 Marks)

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.

**Module-5**

- 9 a. With a neat diagram, explain Horizontal axis using two aerodynamic blades. (06 Marks)  
b. Explain Variable Speed Constant Frequency with popular schemes in generating system. (08 Marks)  
c. List the advantages and disadvantages of Wind Energy Conversion System. (06 Marks)
- OR**
- 10 a. Explain the analysis of Aerodynamic forces acting on the blade. (08 Marks)  
b. List and explain the applications of Wind energy. (06 Marks)  
c. Explain Environmental aspects of Wind Energy Conversion System. (06 Marks)

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