

# CBCS SCHEME

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18EE653

## Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Renewable Energy Resources

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. What are the advantages and limitations of renewable energy sources? Explain in detail about the prospects of non-conventional energy sources in India. (10 Marks)
- b. Briefly explain factors affecting energy resource development. (10 Marks)

OR

- 2 a. With the help of diagram define :
  - i) Hour angle
  - ii) Latitude angle
  - iii) Solar Azimuth angle
  - iv) Declination angle. (08 Marks)
- b. Briefly explain any three solar thermal energy applications. (06 Marks)
- c. Calculate Zenith angle of the sun at Lucknow ( $26.75^{\circ}\text{N}$ ) at 9.30am on February 16, 2014. (06 Marks)

### Module-2

- 3 a. With a neat sketch discuss the important parts of a flat plate collector. Discuss the material aspects of individual parts. (10 Marks)
- b. State the advantages and disadvantages of concentrated collector over flat plate collector. (05 Marks)
- c. With a neat diagram, explain the working of solar cooker. (05 Marks)

OR

- 4 a. Explain the principle of solar photovoltaic power generation. What are the main parts of solar PV systems? (05 Marks)
- b. What are the advantages and disadvantages of solar PV systems? (05 Marks)
- c. Explain I-V characteristics of a solar cell. Discuss the efficiency of solar cell. (10 Marks)

### Module-3

- 5 a. List the uses of hydrogen energy. (06 Marks)
- b. What are the advantages and disadvantages of hydrogen energy? (06 Marks)
- c. Discuss the considerations and guidelines of wind turbine site selection. Also explain wind energy scenario of India. (08 Marks)

OR

- 6 a. With a neat diagram, explain working of double flash types geothermal electric power generation. (07 Marks)
- b. With a neat diagram, explain waste recovery management scheme. (07 Marks)
- c. What are the advantages and disadvantages of horizontal axis wind turbine. (06 Marks)

**Module-4**

- 7 a. Explain with figures up draft and down draft gasifiers. What are the uses of gasifiers? (08 Marks)  
b. Explain the working of fixed dome type biogas plant. (06 Marks)  
c. List the advantages and disadvantages of tidal power generation. (06 Marks)

**OR**

- 8 a. Explain the single basin and two basin systems of tidal power harnessing. (05 Marks)  
b. Explain various stages of cooling and cleaning of gasifier gas. (05 Marks)  
c. Explain the advantages and disadvantages of tidal wave energy. (05 Marks)  
d. Briefly explain four problems faced is exploiting tidal energy. (05 Marks)

**Module-5**

- 9 a. Explain open cycle and closed cycle OTEC techniques. (10 Marks)  
b. What are the advantages and disadvantages of sea wave power? (05 Marks)  
c. Write a note on device for harnessing wave energy. (05 Marks)

**OR**

- 10 a. What are the advantages and disadvantages and benefits of OTEC? (06 Marks)  
b. With a neat sketch explain oscillating water column device for harnessing sea wave energy. (10 Marks)  
c. Explain the basic Ranking cycle and it's working. (04 Marks)

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