CBCS SCHEME

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18EE653

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Renewable Energy Resources

Time: 3 hrs. Max. Marks: 100

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

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-1

1 a. Explain causes of energy scarcity. **(06 Marks)**

b. Find solar elevation angle (α) at 2 hours after local solar noon on 1st June 2012. For a city which is located at 26.75°N latitude. **(06 Marks)**

c. With reference to the solar radiation geometry define the following :
Declination angle (δ), latitude angle (ϕ), Solar altitude angle (α), surface azimuth angle (γ) **(08 Marks)**

OR

2 a. Explain the classification of energy resources. **(06 Marks)**

b. Discuss about Indian Renewable energy availability. **(06 Marks)**

c. With a neat diagram, explain layers of the sun. **(08 Marks)**

Module-2

3 a. With a schematic diagram, explain working of a Stirling engine. **(06 Marks)**

b. Discuss about different solar cell materials. **(06 Marks)**

c. With neat schematic diagrams, explain solar water heating system and solar pond power generation. **(08 Marks)**

OR

4 a. What are the advantages and disadvantages of concentrating collectors over flat plate collectors? **(06 Marks)**

b. Discuss about advantage and disadvantages of PV systems. **(06 Marks)**

c. With a neat diagram, explain the IV characteristics of a solar cell. **(08 Marks)**

Module-3

5 a. State and explain methods of hydrogen production technologies. **(08 Marks)**

b. Discuss the applications, advantages and disadvantages of hydrogen energy. **(06 Marks)**

c. Describe the main consideration in selecting a site for wind generators. **(06 Marks)**

OR

6 a. With a neat sketch, explain dry steam based geothermal power plant. **(06 Marks)**

b. With necessary diagram, explain waste recovery management scheme. **(08 Marks)**

c. Write the advantages and disadvantages of waste recycling. **(06 Marks)**

Module-4

7 a. With the help of diagram, explain gasifier and their classifications. **(06 Marks)**

b. Explain chemistry of reaction process in gasification. **(08 Marks)**

c. Explain biological and chemical stages of anaerobic digestion. **(06 Marks)**

OR

8 a. With a neat sketch, explain fixed dome type biogas plant. **(08 Marks)**

b. With the help of diagram, explain two basin system in tidal power harnessing. **(06 Marks)**

c. Discuss problems faced in exploiting tidal energy. **(06 Marks)**

Module-5

9 a. With net sketch explain two types of ocean thermal energy conversion plants. **(10 Marks)**

b. Explain oscillating water column devices to harness sea wave energy. **(10 Marks)**

OR

10 a. Write a short note on ocean thermal energy for closed cycle. **(10 Marks)**

b. Explain the devices used for harnessing wave energy. **(10 Marks)**

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