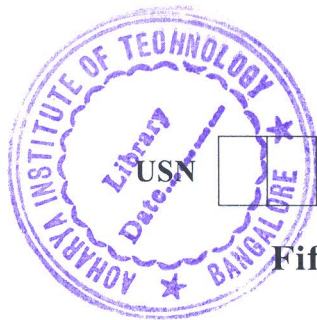


CBCS SCHEME



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15EE563

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the causes of energy scarcity. What are the solution to energy scarcity and limitations of renewable energy sources? (09 Marks)
- b. Explain the factors affecting energy resources development. (04 Marks)
- c. Explain the classification energy resources. (03 Marks)

OR

- 2 a. With reference to the solar radiation geometry define the following :
Declination Angle(δ), Latitude angle(ϕ), Solar Altitude Angle(α), Surface Azimuth Angle(γ). (06 Marks)
- b. Calculate Zenith angle of the sun at Lucknow (26.75°N) at 9.30AM on February 16, 2014. (04 Marks)
- c. Write the short notes on the following :
i) Beam and diffuse radiation and
ii) Solar constant. (06 Marks)

Module-2

- 3 a. With a neat sketches, discuss the important parts of any flat plate collector? Discuss the material aspects of individual parts. (08 Marks)
- b. What are the advantages and disadvantages of concentrating collectors over a flat plate collectors. (08 Marks)

OR

- 4 a. Write a notes on the following :
i) Solar water heating system
ii) Solar pond power generation. (06 Marks)
- b. Explain the principle of solar photovoltaic power generation? What are main parts of solar PV systems? (05 Marks)
- c. What are the major advantages and disadvantages of solar PV systems? (05 Marks)

Module-3

- 5 a. State and explain briefly the methods of hydrogen production technologies. (05 Marks)
- b. What are the applications, advantages and disadvantages of hydrogen energy? (07 Marks)
- c. Mention the problems associated with the development and application of hydrogen energy. (04 Marks)

OR

- 6 a. Explain the considerations and guidelines for the site selection of wind power generation. (05 Marks)
b. Explain any one type of geothermal based electric power generation. (06 Marks)
c. What are the advantages and disadvantages of horizontal – axis wind turbine? (05 Marks)

Module-4

- 7 a. Explain the theory of biomass gasification? List the classification and applications of biomass gasifiers. (04 Marks)
b. Explain with figures up draft and down draft gasifiers? What are their uses above gasifiers. (08 Marks)
c. What are the main applications of gasifiers. (04 Marks)

OR

- 8 a. What is biogas? Explain with block diagram and main stages (process) of Anaerobic digestion. (05 Marks)
b. Explain the construction and working of a typical biogas plants. (06 Marks)
c. What are the advantages and disadvantages tidal power generation? (05 Marks)

Module-5

- 9 a. Discuss the principle and working of sea wave energy. What are the limitations sea wave energy conversion? (05 Marks)
b. What are the advantages and disadvantages of sea wave power? Limitations of sea wave power. (06 Marks)
c. Write a note on devices for harnessing wave energy. (05 Marks)

OR

- 10 a. Explain the principle of OTEC? Explain the basic Rankine cycle and its working. (05 Marks)
b. With block diagram, explain the working of open cycle OTEC. (05 Marks)
c. What are the advantages, disadvantages and benefits of OTEC? (06 Marks)

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