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## Sixth Semester B.E. Degree Examination, June/July 2023 Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain the following solar radiation geometry with sketch:
- Declination
  - Solar Azimuth angle
  - Zenith angle
  - Hour Angle. (10 Marks)
- b. Define flat plate collectors. Write the main components of flat plate components along with sketch. (10 Marks)

OR

- 2 a. Mention the different types of solar water heaters. Explain any 2 method with sketch. (10 Marks)
- b. Define solar pump. Sketch and explain its construction and working principle. (10 Marks)

### Module-2

- 3 a. Write a short note on the following:
- The nature of wind
  - The power in wind
  - Wind energy conversion. (10 Marks)
- b. What are the consideration should be made on site selection for locating wind mill? (10 Marks)

OR

- 4 a. Sketch and explain the construction and working of the horizontal axis machine of wind mill. (10 Marks)
- b. Sketch and explain the construction and working of the vertical axis wind mill. (10 Marks)

### Module-3

- 5 a. Mention the different kinds of geothermal resource. Sketch and explain vapour dominated power plant. (10 Marks)
- b. Sketch and explain heat extraction from hot dry rocks. (10 Marks)

OR

- 6 a. Write a short note on:
- Geo-thermal exploration. (10 Marks)
  - Operational and environmental problems. (06 Marks)
- b. Write the advantage and disadvantage of the geothermal energy. (04 Marks)
- c. Write the application of geothermal energy. (04 Marks)

**Module-4**

- 7 a. Mention the different method of ocean thermal electric power generation. Sketch and explain any one type. (10 Marks)  
b. Define storage explain 4 types of storage. (05 Marks)  
c. Briefly explain the advantages and limitation of tidal power generation. (05 Marks)

OR

- 8 a. Explain wave-energy conversion by float. (10 Marks)  
b. Write the advantage and disadvantage of wave energy. (10 Marks)

**Module-5**

- 9 a. Define hydrogen-storage. Mention the methods of hydrogen storage and explain any 2 method briefly. (10 Marks)  
b. What are the hydrogen transportation methods? Explain briefly and mention the utilization of hydrogen gas. (10 Marks)

OR

- 10 a. Sketch and explain the following:  
i) Bulb or Tubular turbine (10 Marks)  
ii) Tube turbine. (10 Marks)  
b. Write the advantage and disadvantage of small scale Hydro-Electric. (10 Marks)

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