



**Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025**  
**Renewable Energy Power Plants**

Time: 3 hrs.

Max. Marks: 100

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

**Module-1**

- 1 a. Elaborate on India's production and reserves of commercial energy sources (10 Marks)
- b. What is the need for alternative energy sources? (04 Marks)
- c. Explain with a neat sketch, Solar radiation at the earth's surface. (06 Marks)

**OR**

- 2 a. With a neat sketch, explain the working principle of extra terrestrial radiation. (10 Marks)
- b. With a neat sketch, explain the working principle of shading ring pyreheliometer. (10 Marks)

**Module-2**

- 3 a. Define the following : i) Declination angle ii) Latitude iii) Hour angle  
iv) Zenith angle v) Surface azimuth angle. (10 Marks)
- b. Describe with a neat sketch, the working principle of Solar pond. (10 Marks)

**OR**

- 4 a. List and explain the various parameters that effect the performance of flat plate collectors. (10 Marks)
- b. Explain with a neat sketch, photovoltaic conversion. (10 Marks)

**Module-3**

- 5 a. List the types of wind mills. Explain horizontal axis wind mill with neat sketch. (10 Marks)
- b. List the advantages , disadvantages and applications of wind energy. (10 Marks)

**OR**

- 6 a. Discuss the applications of biogas in engines. (04 Marks)
- b. Explain briefly the KVIC model biogas plant with a neat sketch. (08 Marks)
- c. With a neat sketch, explain working principle of Janta Model biogas digester (Fixed dome). (08 Marks)

**Module-4**

- 7 a. Discuss with a neat sketch, hydro power plant. (10 Marks)
- b. Explain with a neat sketch, Operation of double basin tidal power plant. (10 Marks)

**OR**

- 8 a. What are the different types of wave energy conversion devices? (04 Marks)
- b. With the help of neat diagram , explain wave energy conversion system by floats. (08 Marks)
- c. What are the advantages and limitation of wave energy conversion? (08 Marks)

**Module-5**

- 9 a. With a neat sketch, describe the closed cycle OTEC system. (10 Marks)  
b. What are the problems associated with OTEC? (05 Marks)  
c. What are the advantages and disadvantages of geothermal energy over other energy sources? (05 Marks)

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**OR**

- 10 a. Explain with a neat sketch, working principle of vapour dominated geothermal plant. (10 Marks)  
b. Describe with a neat sketch, geothermal energy system by Hot Dry Rock. (10 Marks)

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