

--	--	--	--	--	--	--	--	--	--



# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Mechanical Engineering

Semester End Examination; Jan. / Feb. - 2021

Renewable Energy Technology

Time: 3 hrs

Max. Marks: 100

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

## UNIT - I

- 1 a. Discuss India's production and reserves of commercial energy sources. 10
- b. Write a note on; 10
  - i) Solar photovoltaic
  - ii) Wave energy
- 2 a. With a neat diagram, explain the spectral distribution of solar radiation intensity. 10
- b. Define the following:
  - i) Extra-terrestrial radiation
  - ii) Solar constant 10
  - iii) Beam radiation
  - iv) Diffused radiation
  - v) Insolation

## UNIT - II

- 3 a. With a neat sketch, explain the construction and working of shading ring. 10
- b. Define the following terms with suitable sketch:
  - i) Latitude
  - ii) Zenith angle 10
  - iii) Hour angle
  - iv) Solar azimuth angle
  - v) Declination
- 4 a. Sketch and explain the working of pyrheliometer. 10
- b. Derive the expression for angle between the incident beam and the normal to a plane surface and the day length. 10

## UNIT - III

- 5 a. With a neat sketch, explain the working of paraboloid concentrating collector. 10
- b. List the different types of storage systems and explain two of them. 10
- 6 a. Describe the working of Vapour-dominated geothermal power plant with a neat diagram 12
- b. Discuss the environmental-problems associated with the geothermal energy conversion. 8

## UNIT - IV

- 7 a. Sketch and explain the working of vertical axis wind machine. 10
- b. Define Tide. Write the advantages and limitations of tidal power generation. 10
- 8 a. Explain the working of open cycle OTEC system with a neat diagram. 12
- b. Explain the double basin tidal system with a neat sketch. 8

## UNIT - V

- 9 a. Discuss the process of an-aerobic fermentation and list the advantages. 10
- b. Sketch and explain the working of KVIC digester. 10
- 10 a. With a neat sketch, explain the electrolytic production of hydrogen. 10
- b. Describe the different methods of hydrogen storage and hydrogen transportation. 10