

Code No: 128EE

R15**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year II Semester Examinations, July - 2019****RENEWABLE ENERGY SOURCES****(Mechanical Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What is the difference between extraterrestrial and terrestrial solar radiation? [2]
- b) How do you measure solar radiation on tilted surfaces? [3]
- c) Give the classification in concentrating collectors. [2]
- d) Draw the V- I characteristics of a photovoltaic cell. [3]
- e) What is the difference between aerobic digestion and anaerobic digestion? [2]
- f) What are the advantages of horizontal - axis wind turbines over vertical - axis wind turbines? [3]
- g) What is the difference between tidal energy and wave energy? [2]
- h) List the advantages of geothermal energy. [3]
- i) What is Direct Energy Conversion (DEC)? [2]
- j) What is the principle of operation of MHD generator? [3]

PART - B**(50 Marks)**

- 2.a) Explain about different parameters that describe the amount of solar energy reaching the Earth's surface.
 - b) With the help of a neat diagram, explain about Pyranometer. [4+6]
- OR**
- 3.a) With the help of a neat diagram, explain the working of sunshine recorder.
 - b) Discuss on potential of renewable energy sources in India. [5+5]

- 4.a) With the help of a neat diagram, explain the working of a concentrating collector.
- b) Explain about solar drying. [6+4]

OR

- 5.a) Explain the working of solar cooling system with the help of a diagram.
- b) Explain about any two methods of solar energy storage. [6+ 4]
- 6.a) Describe the salient features of a vertical - axis wind turbine with the help a diagram.
- b) Explain about various forces acting on the blade of a wind turbine. [6+ 4]

OR

- 7.a) With the help of a neat diagram, explain the construction and working of floating drum type bio - gas plant.
- b) Explain about IC engine operation using bio - gas. [8+ 2]

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- 8.a) Explain in detail about different types of conversion techniques for tidal energy.
b) Explain about the economic aspects of mini hydel power plant. [6+ 4]

OR

- 9.a) Discuss in detail about various methods to harness geothermal energy.
b) Explain about the potential of geothermal energy in India. [8+2]

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- 10.a) With the help of a diagram, explain the operation of a fuel cell.
b) Explain about i) MHD accelerator ii) MHD engine [4+6]

OR

- 11.a) Explain about the applications of thermo- electric generators.
b) Explain about the thermodynamic aspects of fuel cells. [5+5]

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