

Code No: 157SQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February/March - 2022

NON-CONVENTIONAL ENERGY SOURCES

(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions
All Questions Carry Equal Marks

- 1.a) Explain how the solar radiation is measured and data is obtained.
b) Calculate the sunset hour angle and day length at location latitude of 45N on January 1. [5+10]
- 2.a) Differentiate between i) altitude angle, ii) azimuthal angle, iii) Zenith angle, iv) Incident angle.
b) Write down the empirical equation for estimating the monthly average of daily global radiation on a tilted surface and Estimate the global radiation on a horizontal location at vizag (17.68N, 83.21E) during the month of April. If the constant a and b are 0.28 and 0.47 respectively and average sunshine hours for the day is 9.0. [7+8]
- 3.a) Explain the working of a forced-circulation solar water heater.
b) Distinguish between flat plate collector and concentrating collector and recommend which collector you will prefer for your house as a water heater and justify your answer. [7+8]
- 4.a) Write a short note on setback, peltier and joule thomson effects.
b) How does a fuel cell work? What are its components? Write about its principle of operation. [8+7]
- 5.a) With a neat sketch explain, the operation of a solar pond.
b) What are the advantages and disadvantages of tidal plants in the Indian context? [8+7]
- 6.a) Explain the basic principle of Wind energy conversion
b) What are the advantages of Vertical axis machines over Horizontal Type? [7+8]
- 7.a) What is meant by wet fermentation and dry fermentation?
b) What are the factors affecting the performance of a biomass? [8+7]
- 8.a) List and explain the different categories of Geothermal Sources
b) What are the advantages and disadvantages of geothermal energy forms? [8+7]