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Code No: 128ED

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, July - 2019
RENEWABLE ENERGY SOURCES
(Electrical and Electronics 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) Define Solar Constant [2]
b) What is Renewable Energy? Which Renewable Energy is giving maximum contribution in terms of Power production in India? [3]
c) Write the principle of Solar distillation unit. [2]
d) What would be the suitable orientation of Flat Plate Collector in Southern India to get maximum efficiency? Why? [3]
e) What is the main advantage of horizontal axis wind turbines over vertical axis wind turbines? [2]
f) Differentiate between acetogenesis and methanogenesis [3]
g) What is main difference between dry steam and flash steam geothermal plants? [2]
h) In which region of earth the OTEC's are usually setup? What is the working fluid preferred for OTEC? Give the boiling point of it. [3]
i) Give the names of different types of Fuel Cells [2]
j) Name any three Direct Energy Conversion Devices with their energy conversion mechanism. [3]

PART - B

(50 Marks)

2. Explain why renewable energy sources are preferred over conventional energy sources in Indian Context. What are all the added advantages of using renewable energy sources? [10]

OR

3. Write a short note on, a) Solar Zenith Angle, b) Solar Azimuthal Angle, c) Solar Declination Angle, d) Sun Shine Recorder, e) Direct Solar Radiation Measurement.[10]

4. Explain the principle of Photovoltic Power Generator. What are the main elements of PV system? [10]

OR

5. Explain the working principle, components of flat plate collector. [10]

6. Explain with a neat diagram how a horizontal axis type wind turbine works? Give the formula for calculating its efficiency and write about site selection criteria for wind turbine. [10]

OR

7. The following data given for a family biogas digester suitable for the output of 8 cows.
Given: Calorific value of methane: 28MJ/m^3; Burner efficiency:70%; Retention period: 20days; Temperature of fermentation: 30°C; Dry matter (cow dung) collected per cow per day: 2Kg; Density of dry matter in fluid(slurry) in the digester: 50kg/m^3; Biogas yield: 0.2m^3 per kg of dry input; Methane proportion in the biogas: 0.7
Calculate (a) The volume of biogas digester (b) The power available from the digester. [10]

8. Describe working of Closed Cycle OTEC system with the help of neat sketch. [10]

OR

9. What are liquid dominated hydrothermal resources? How these can be utilized in high temperature wet steam system? [10]

10. What is fuel cell? What are all the main components of Fuel Cell? Why it is having high advantages than any other direct energy conversion devices? [10]

OR

11. State at least 10 disadvantages of conventional energy sources and tell for each disadvantages what can be correction factor. Justify your answer by keeping in mind only the direct energy conversion systems. [10]

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