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10EE836

Eighth Semester B.E. Degree Examination, June/July 2015
Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1 a. What is meant by Renewable Energy Sources? Explain in brief these energy sources, with a special reference to the Indian context. (10 Marks)
- b. What are the advantages and limitations of Renewable Energy Sources? Explain the prospects on Non – conventional Energy Sources in India. (10 Marks)
- 2 a. Define the following with respect to Solar radiation : i) Altitude Angle ii) Zenith Angle iii) Declination Angle iv) Hour Angle. (06 Marks)
- b. Calculate the sunset hour angle and day length at location latitude of 35°N on February 14^{th} . (04 Marks)
- c. What is the difference between Pyrheliometer and Pyranometer? Describe the principle of Angstrom type pyrheliometer. (10 Marks)
- 3 a. Explain the principle of conversion of solar energy into heat. Explain with a neat diagram how this is employed in Flat plate collectors. (10 Marks)
- b. State the advantages and disadvantages of concentrating collectors over Flat plate collectors. (04 Marks)
- c. Classify solar energy storage systems. Describe in brief any one of the different storage systems. (06 Marks)
- 4 a. With a neat sketch, describe the construction and working of solar cooker. (06 Marks)
- b. Explain the principle of solar photovoltaic power generation. What are the main elements of solar PV system? (10 Marks)
- c. What are major advantages and disadvantages of solar PV system? (04 Marks)

PART - B

- 5 a. Classify the Wind Energy Conversion Systems. (04 Marks)
- b. State and briefly explain the factors that determine the output power from wind energy. (06 Marks)
- c. With usual notations, derive an expression for the maximum power output of horizontal axis wind turbine. (10 Marks)
- 6 a. Explain clearly the factors affecting the Biogas generation. (10 Marks)
- b. With a neat diagram, explain the KVIC biogas plant. (10 Marks)
- 7 a. Discuss the basic principle of OTEC plants. Explain in brief the main types of OTEC systems. (10 Marks)
- b. With a simple diagram, the working of a tidal power plant. (06 Marks)
- c. List out the advantages and limitations of OTEC plants. (04 Marks)
- 8 Write short notes on :
 - a. Applications of wind energy.
 - b. Wave Energy.
 - c. Stand – alone solar PV system.
 - d. Small hydro resources.(20 Marks)
