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Eighth Semester B.E. Degree Examination, June/July 2016

Renewable Energy Sources

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1
 - a. List the difference between renewable and nonrenewable energy sources. (08 Marks)
 - b. What are the advantages and limitations of renewable energy sources? (06 Marks)
 - c. Explain briefly the Indian Energy Scenario. (06 Marks)

- 2
 - a. What is difference between pyrheliometer and pyranometer? Describe the principle of Angstrom type pyrheliometer. (10 Marks)
 - b. Define the terms: i) Altitude angle, ii) Zenith angle and iii) Declination angle. (06 Marks)
 - c. Calculate the day length on a horizontal surface at New Delhi ($28^{\circ}35'N$, $77^{\circ}12'E$) on December 1st. (04 Marks)

- 3
 - a. With a neat diagram, explain the working principle of solar water heater. (06 Marks)
 - b. State the advantages and disadvantages of concentrated collector over flat plate collector. (04 Marks)
 - c. Classify the different methods of storing solar energy. Describe thermal energy storage systems. (10 Marks)

- 4
 - a. With a neat diagram, explain solar water pumping systems. (08 Marks)
 - b. What are the major advantages and disadvantages of solar PV systems? (04 Marks)
 - c. With the help of neat diagrams, describe the principle and working of central receiver system. (08 Marks)

PART – B

- 5
 - a. What is basic principle of wind energy conversion system? Classify the wind energy conversion system. (04 Marks)
 - b. With a neat block diagram, explain the basic components of WECS. (08 Marks)
 - c. With usual notations, derive an expression for the maximum power output of wind turbine. (08 Marks)

- 6
 - a. What are the factors affecting biogas generation? (04 Marks)
 - b. With a neat diagram, explain KVIC biogas plant. (10 Marks)
 - c. What are the advantages and disadvantages of floating drum type plant? (06 Marks)

- 7
 - a. Explain the working of single basin Tidal plant. (06 Marks)
 - b. With a suitable diagram, explain the working of open cycle OTEC for ocean thermal energy. (10 Marks)
 - c. What are the advantages and limitations of wave energy conversion systems? (04 Marks)

- 8
 - a. Describe the classification of fuel cell. With a neat sketch, explain the working of fuel cell. (08 Marks)
 - b. Explain various methods of production of hydrogen for the use of energy carrier. (06 Marks)
 - c. What are the advantages and disadvantages of small hydropower plants? (06 Marks)