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10EE836

Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Renewable Energy Sources

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. What are the conclusions on alternate energy strategies? (06 Marks)
- b. Discuss briefly the prospects of non-conventional energy sources in India. (06 Marks)
- c. What are Primary and Secondary energy sources? Mention the advantages of renewable energy sources. (08 Marks)
- 2 a. Define : (i) Direct radiation (ii) Diffuse radiation (iii) Solar constant (iv) Zenith angle (v) Altitude angle. (05 Marks)
- b. Calculate the angle made by beam radiation with the normal to a flat collector on December 1, at 9.00am, solar time for a location at 28°35' N. The collector is tilted at an angle of latitude plus 10°, with horizontal and is pointing due south. (07 Marks)
- c. Classify the instrument used for measurement of solar radiation and discuss in brief. (08 Marks)
- 3 a. With a neat sketch, explain the principle of conversion of solar energy into heat. (06 Marks)
- b. List out the advantages and disadvantages of concentrating collectors over a flat-plate collector. (08 Marks)
- c. Why orientation is needed in concentrating type collectors? Describe the different methods of sun tracking. (06 Marks)
- 4 a. What are the different approaches of thermal electric conversion system from solar energy? Discuss in detail with a neat sketch any one of them. (10 Marks)
- b. What is the principle of solar photovoltaic power generation? What are the main elements of a PV system? Mention the advantages and limitation of photo voltaic solar energy conversion. (10 Marks)

PART – B

- 5 a. List out the main considerations in selecting a site for wind generations. (06 Marks)
- b. Describe with a neat sketch the working of a wind – energy conversion system with main components. (08 Marks)
- c. Derive the expression for power available in the wind. (06 Marks)
- 6 a. Briefly discuss any six factors affecting biodigestion. (06 Marks)
- b. With a neat diagram, explain Janta Biogas plant. (06 Marks)
- c. Discuss the possible energy conversion routes and products from biomass. (08 Marks)
- 7 a. Distinguish: i) Single basin arrangement ii) Double basin arrangement. For generation of electricity from water power with relevant sketches. (10 Marks)
- b. What are the main types of OTEC power plants? Describe their working in brief. (10 Marks)
- 8 Write short notes on : (20 Marks)
 - a) Fuel cell
 - b) Small Hydro Resources
 - c) Hydrogen Energy
 - d) Wave energy.

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24 JAN 2020

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.