



10EE836

Eighth Semester B.E. Degree Examination, Aug./Sept.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 conventional and non-conventional energy sources? Describe the Fossile fuels as the conventional energy resources. (12 Marks)
b. What are advantages and limitations of renewable energy sources? (08 Marks)
- 2 a. Define the following terms:
(i) Altitude Angle (ii) Zenith Angle
(iii) Solar azimuth angle (iv) Declination angle (08 Marks)
b. With neat diagram, explain Angstrom Compensation Pyrheliometer. (04 Marks)
c. Determine the local solar time and declination at a location latitude $23^{\circ}15'N$, longitude $77^{\circ}30'E$ at 12.30 IST on June 19. Equation of time correction is given from standard table or chart = $-(1'01'')$. (08 Marks)
- 3 a. What are the main components of a flat-plate solar collector? Explain the function of each. (10 Marks)
b. Write short notes on: (i) Solar distillation (ii) Solar pumping (10 Marks)
- 4 a. With neat diagram, explain the principle of solar photovoltaic power generation. What are the main elements of a PV system? (10 Marks)
b. Explain solar pond power plant system with appropriate diagram. What are its limitations? (10 Marks)

PART – B

- 5 a. Describe with a neat sketch the working of a Wind Energy Conversion System (WECS) with main components. (10 Marks)
b. Find the total power density in the wind stream from the following data:
Wind at 1 standard atmospheric pressure and $15^{\circ}C$ has a velocity of 15 m/s,
 $\rho = \text{Air density} = 1.226 \text{ kg/m}^3$. Also calculate maximum power density. (10 Marks)
- 6 a. Explain the constructional details and working of KVIC digester. (10 Marks)
b. What are the factors, which effect the size of the biogas plants? (06 Marks)
c. Write the main applications of biogas. (04 Marks)
- 7 a. Describe with sketches the various of methods of tidal power generation. What are the limitations of each method? (12 Marks)
b. Describe the "closed cycle" OTEC system, with its advantages over "open cycle" system. (08 Marks)
- 8 a. What are the different methods for hydrogen production? Explain in brief. (09 Marks)
b. Write the main application of hydrogen gas. (05 Marks)
c. What are the advantages and disadvantages of fuel cell? (06 Marks)

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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.