USN | | | | | | | | | | |

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°15′N, longitude 77°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°C has a velocity of 15 m/s, ρ = Air density = 1.226 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)**

* * * * *