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10ME754

Seventh Semester B.E. Degree Examination, June/July 2018
Non – Conventional Energy Sources

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. What are the conventional and non – conventional energy sources? Describe briefly. (10 Marks)
- b. With sketches, explain the production of oil from oil shale and Tar sands. Mention the limitations. (10 Marks)
- 2 a. Define the following terms : (08 Marks)
 - i) Zenith angle ii) Local solar time iii) Declination angle iv) Hour angle.
- b. With the help of a neat sketch, explain the working principle of sunshine recorder. (06 Marks)
- c. Calculate the local apparent time (LAT) corresponding to 13 – 30(IST) on July 16, 1998 at Delhi ($28^{\circ} 35' N$, $77^{\circ} 12' E$). The equation of time correction on July 16 is (-6) minutes. Indian standard time (IST) is the local civil time corresponding to $82.50^{\circ} E$ longitudes. Also calculate the declination. (06 Marks)
- 3 a. With the help of usual expression, explain Diffuse radiation and reflected radiation on the tilted surface. (06 Marks)
- b. With a neat sketch, explain Solar pond. (06 Marks)
- c. With a neat sketch, describe in detail the working of continuous vapour absorption cooling system. (08 Marks)
- 4 a. With neat sketch, explain liquid flat plate collector. (10 Marks)
- b. For a glass cover system estimate τ_p for the following data. Angle of incidence = 45° , Number of cover = 2 , Thickness of each cover = 4mm , Refractive index of glass relative to air = 1.52. (10 Marks)

PART – B

- 5 a. Explain with a neat sketch, the working of Photo – Voltaic cell. Mention any four application of solar Photovoltaic system. (10 Marks)
- b. Explain briefly any two types of Horizontal axis wind mills. (10 Marks)
- 6 a. With a neat sketch, explain the working of double basin tidal power plant. (06 Marks)
- b. With a neat sketch, explain the working principle of OTEC (closed) plant. (08 Marks)
- c. List the advantages and limitations of geothermal energy. (06 Marks)
- 7 a. Discuss the factors which affects the Bio – gas production in biogas plant. (10 Marks)
- b. Classify biogas plant and explain any one plant with neat sketch. (10 Marks)
- 8 a. With a neat sketch, explain the working principle of tank type electrolyzer for hydrogen production. (10 Marks)
- b. What are the different methods for hydrogen storage? Describe their advantages and disadvantages. (10 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.