

## ONE TIME EXIT SCHEME

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BANGALORE - 560 037

10ME754

Seventh Semester B.E. Degree Examination, April 2018

**Non Conventional Energy Sources**

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer *FIVE* full questions, selecting at least *TWO* questions from each part.  
2. Missing data may suitably assume.

**PART – A**

- 1 a. What are non – conventional energy sources? Explain in brief the prospects of these energy sources with reference to Indian context. (12 Marks)
- b. Explain the following energy sources : (08 Marks)
  - i) Tar sands      ii) Oil shale
- 2 a. With relevant figures define the following : (09 Marks)
  - i) Declination      ii) Solar altitude      iii) Hour angle
  - iv) Solar Azimuth angle      v) Zenith angle      vi) Incident angle.
- b. Explain in brief beam and diffuse solar radiation. (03 Marks)
- c. With a neat sketch, explain the working of an instrument used to measure beam radiation of solar energy. (08 Marks)
- 3 a. Describe in brief the different methods used to store the solar energy. (08 Marks)
- b. Explain the following with neat sketch. (12 Marks)
  - i) Solar refrigeration      ii) Solar Ponds.
- 4 a. What are the main components of a flat plate solar collector, explain the function of each. (05 Marks)
- b. Explain briefly the factors affecting the performance of flat plate collector. (15 Marks)

**PART – B**

- 5 a. Write a brief note on principle of photo voltaic conversion. (04 Marks)
- b. Explain in brief the following performance factors of a wind machine (10 Marks)
  - i) Power coefficient      ii) Lift coefficient      iii) Drag coefficient
  - iv) Tip speed ratio      v) Solidity.
- c. With a neat sketch explain horizontal axis wind mill. (06 Marks)
- 6 a. Describe the working of a tidal power plant working under Double basin arrangement. (07 Marks)
- b. Explain the various problems associated with OTEC. (05 Marks)
- c. With neat sketch, explain the working of 'Hot dry rock' geothermal plant. (08 Marks)
- 7 a. Explain briefly the factors affecting the biogas generation. (08 Marks)
- b. Explain with a neat sketch how biogas is produced in an Indian type biogas plant. (08 Marks)
- c. Write a brief note on applications of biogas. (04 Marks)
- 8 a. With a neat sketch, explain the electrolytic production of hydrogen. (08 Marks)
- b. Explain the different methods of Hydrogen storage. (06 Marks)
- c. Explain briefly the various utilizations of Hydrogen gas. (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.