

[Total No. of Questions - 9] [Total No. of Printed Pages - 2]  
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**B. Tech 7th Semester Examination**  
**Non-Conventional Energy Sources (OS)**  
**ME-7018**

**Time : 3 Hours**

**Max. Marks : 100**

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** This question paper carries five sections. Attempt any five questions selecting atleast one question each from section A, B, C & D. Section E is compulsory. All questions carry 20 marks.

**SECTION - A**

1. Enumerate the different types of concentrating type collectors. Describe a collector used in power plant for generation of electrical energy. What are the advantages and disadvantages of concentrating collectors over flat plate collectors? (20)
2. What do you understand by the term renewable energy resources? Explain in brief these resources and discuss their significance in reference to the increased energy consumption scenario of India. (20)

**SECTION - B**

3. Discuss in detail the working principle of Horizontal axis wind turbine (HAWT) and briefly explain about the various components of such turbine. Develop an expression for Betz's limit for such turbine. Also, explain the methods and techniques used to assess the wind potential of a probable site. (20)

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4. Explain with the help of neat sketch the various techniques used in the conversion of biomass into various useful forms. Discuss the various factors affecting the efficiency of anaerobic digestion process. Discuss the working and design of KVIC biogas plant with the help of neat diagram. (20)

**SECTION - C**

5. What is geothermal energy? Briefly explain the various geothermal resources. Discuss the working of a liquid dominated geothermal power generating system with the help of a block diagram. Also give the range of pressure and temperature values for this system. (20)
6. Explain with sketches the various methods of tidal power generation. What are the limitations of each method? (20)

**SECTION - D**

7. Describe the working principle of Ocean thermal energy conversion. Explain with the working of closed cycle OTEC plant using suitable block diagram. How the different types of OTEC plants are located? (20)
8. Describe the term Fluidized bed combustion, its types and relative advantages and disadvantages. (20)

**SECTION - E**

9. Explain briefly the following terms:
  - (a) Algae production and its usages.
  - (b) Solar Pumps.
  - (c) Geothermal energy potential of India.
  - (d) Types of rotor blades in vertical axis wind turbine.
  - (e) Applications of OTEC systems. (5×4=20)