(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2532 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VI) THEORY EXAMINATION 2011–12

NON-CONVENTIONAL ENERGY RESOURCES & UTILIZATION

Time : 2 Hours *Total Marks : 50*

Note :– (1) Attempt **all** questions.

(2) All questions carry equal marks.

1. Answer any **two** of the following : **(5×2=10)**

(a) What are the commercial and non-commercial energy resources, and renewable and non-renewable energy resources ?

(b) Which type of non-conventional energy source is the best suitable for rural and agricultural application and why ? Explain in detail.

(c) Calculate the number of daylight hours at Delhi on December 21 and June 21 in a leap year.

2. Answer any **two** of the following : **(5×2=10)**

(a) Write short notes on :

(i) Solar cell materials

(ii) Application of PV system

(iii) V-I characteristic of solar cell.

(b) A thermal energy storage with a storage capacity Q_s of 300 kWh uses water as a storage medium. The water temperature in the storage varies between 80°C in fully charged state and 20°C in fully discharged state. Determine the required mass and volume of water as well as the mass and volume related energy density of storage.

(c) What are the various types of solar thermal power plants ?

3. Answer any **two** of the following : **(5×2=10)**

(a) What are the factors which affect the generation of Biogas ?

(b) Compare the fixed dome type plant and movable drum type plant with neat and clean sketch.

(c) What methods are used to overcome the fluctuating power generation of a windmill ? Discuss their merits and demerits.

4. Answer any **two** of the following : **(5×2=10)**

(a) What is the difference between a fuel cell and a battery ? Explain the working function of solid oxide fuel cells with neat sketch.

(b) Explain the various methods of tidal power generation. What are the limitations of each method ?

(c) Describe briefly on :

(i) Problems with hydrogen as fuel

(ii) Storage and transportation

(iii) Hydrogen cartridge.

5. Answer any **two** of the following : **(5×2=10)**

(a) Explain Seebeck thermoelectric effect. How Seebeck co-efficient vary with temperature ?

(b) What are the advantages and disadvantages of geothermal energy ? Describe a Binary cycle system for liquid dominated system.

(c) What is Ocean Thermal Energy ? Explain the principle of open cycle OTEC system with suitable diagram.