

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

PAPER ID : 0485

Roll No.

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B.Tech.

(SEM VIII) EVEN SEMESTER THEORY EXAMINATION,
2009-2010

**NON-CONVENTIONAL ENERGY RESOURCES
AND UTILIZATION**

Time : 3 Hours

Total Marks : 100

Note : (i) Attempt *all* questions. Marks are indicated against each question/part.

(ii) Give brief and to the point answer.

1. Answer *any two* parts of the following : (2x10=20)

- (a) Discuss conventional energy resources in India and abroad. Discuss the possibility of exploiting the non-conventional energy in India.
- (b) Explain the working of any one of the following, with the help of neat sketch :
 - (i) Pyranometer
 - (ii) Pyrheliometer
- (c) Answer the following :
 - (i) Explain "Latitude", "Declination angle" and "Surface Azimuth angle".
 - (ii) Discuss "Apparent Motion of Sun" and "Local Apparent Time".

2. Answer *any four* parts of the following : (4x5=20)

- (a) What do you understand by "Top Loss Coefficient" and "Side Loss Coefficient" ?
- (b) Explain the principle of working of "Solar Pond".
- (c) With the help of neat sketch, explain the working of a solar water heater.
- (d) Explain the working of tracking mechanism for a concentrating collector.
- (e) Discuss the solar energy storage in a fully stratified water tank.
- (f) What do you understand by Solar distillation ?

3. Answer *any two* parts of the following : (2x10=20)

- (a) Compare different types of Bio-gas plants.
- (b) Explain anaerobic digestion process taking place in a biogas plant.
- (c) What do you understand by "Magnus Effect" ?
- (d) What are the recent developments in the technology of large wind mills ?
- (e) Compare Horizontal and vertical axis wind mills.
- (f) Derive an expression for the total power of a wind stream.

4. Answer *any two* parts of the following : (2x10=20)

- (a) Discuss various types of fuel cells. Derive an expression for the efficiency of a fuel cell.
- (b) Explain the working of a simple single pool (basin) tidal system and derive an expression for the power generated by it.
- (c) Answer the following :
 - (i) Discuss production of Hydrogen.
 - (ii) Explain the working of a Thermionic Generator with the help of neat sketch.

5. Answer *any two* parts of the following : (2x10=20)

- (a) Discuss "Peltier effect", "Seebeck effect", and "Thomson effect". Explain working of "Thermoelectric Generator".
- (b) Discuss origin and types of Geothermal Energy. Briefly discuss "Hot Springs" and "Steam Ejectors".
- (c) Answer the following :
 - (i) With the help of neat sketch explain the working of an OTEC plant.
 - (ii) Derive expressions for the potential energy and kinetic energy of a progressive sine wave of a tide.