

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

**PAPER ID : 0485**

Roll No.

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B.Tech.

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(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)
- What do you understand by "Top Loss Coefficient" and "Side Loss Coefficient" ?
  - Explain the principle of working of "Solar Pond".
  - With the help of neat sketch, explain the working of a solar water heater.
  - Explain the working of tracking mechanism for a concentrating collector.
  - Discuss the solar energy storage in a fully stratified water tank.
  - What do you understand by Solar distillation ?
3. Answer *any two* parts of the following : (2x10=20)
- Compare different types of Bio-gas plants.
  - Explain anaerobic digestion process taking place in a biogas plant.
  - What do you understand by "Magnus Effect" ?
  - What are the recent developments in the technology of large wind mills ?
  - Compare Horizontal and vertical axis wind mills.
  - Derive an expression for the total power of a wind stream.

4. Answer *any two* parts of the following : (2x10=20)
- Discuss various types of fuel cells. Derive an expression for the efficiency of a fuel cell.
  - Explain the working of a simple single pool (basin) tidal system and derive an expression for the power generated by it.
  - Answer the following :
    - Discuss production of Hydrogen.
    - Explain the working of a Thermionic Generator with the help of neat sketch.
5. Answer *any two* parts of the following : (2x10=20)
- Discuss "Peltier effect", "Seebeck effect", and "Thomson effect". Explain working of "Thermoelectric Generator".
  - Discuss origin and types of Geothermal Energy. Briefly discuss "Hot Springs" and "Steam Ejectors".
  - Answer the following :
    - With the help of neat sketch explain the working of an OTEC plant.
    - Derive expressions for the potential energy and kinetic energy of a progressive sine wave of a tide.

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