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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.

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