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TME - 023

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

PAPER ID : 0485

Roll No.

B. Tech.

(SEM. VIII) EXAMINATION, 2008-09

**NON-CONVENTIONAL ENERGY
RESOURCES & UTILIZATION**

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt all questions
 - (2) All questions carry equal marks.
 - (3) Be precise in your answer.
 - (4) No second Answer Book will be provided.

1 Answer any **two** of the following : **10×2=20**

- (a) Discuss the primary and secondary energy sources.
Also describe the future of non-conventional energy sources, in India.
- (b) Define the terms:
 - (i) Altitude angle
 - (ii) Incident Angle
 - (iii) Zenith angle
 - (iv) Latitude angle
 - (v) Hour angle
- (c) Differentiate between beam and diffuse radiation. Describe a type of instrument to measure beam radiator with a neat sketch.

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2 Answer any **four** of the following. $5 \times 4 = 20$

- (a) Explain the principle of conversion of solar energy into heat. Explain a flat plate solar collector.
- (b) Enumerate the different types of concentrating type collector.
- (c) Classify the solar energy storage system.
- (d) What is meant by solar pond? Explain.
- (e) Describe the working of solar power plant.
- (f) Describe a continuous solar cooling system.

3 Answer any **four** of the following: $5 \times 4 = 20$

- (a) How bio-mass conversion takes place?
- (b) Explain the process 'photosynthesis'. What are the conditions which are necessary for it?
- (c) How are biogas plant classified? Explain them briefly.
- (d) What are the basic principles of wind energy conversion?
- (e) How are wind energy conversion system classified? Discuss in brief.
- (f) Describe horizontal axis type aero-generator.

4 Answer any **two** of the following: $10 \times 2 = 20$

- (a) What do you understand by fuel cell? How fuel cells are classified? Describe an H_2-O_2 fuel cell with a sketch showing reactions.
- (b) What do you understand by thermionic emission effect? Derive the expression for power and efficiency of a thermionic generator.
- (c) Write notes on:
 - (i) Limitations of Tidal Energy Conversion System
 - (ii) Safety precautions of hydrogen as fuel

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5 Answer any **two** of the following: $10 \times 2 = 20$

- (a) Describe the working of a Thermo-electric generator. Derive an expression for its power output.
- (b) Describe a geothermal field from which geothermal steam is obtained through hot springs. What are the prospects of geothermal energy in context to India?
- (c) Describe the basic principle of ocean thermal energy conversion system. Enlist the various plants based upon it. Describe an OTEC plant.

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