

8. Write short notes on :

- (a) Classification fuel cells and applications
- (b) Biogas from wastes
- (c) Solar-Thermal conversion.

[2537/I/12]

[06 - 4203]

IV/IV B.E. DEGREE EXAMINATION.

Second Semester

Electrical and Electronics Engineering

Elective II (A) — NON-CONVENTIONAL ENERGY SOURCES

(Effective from the admitted batch of 1999 - 2000).

Time : Three hours

Maximum : 70 marks

Answer question No. 1 and any FOUR from the rest.

All questions carry equal marks.

1. (a) What are the advantages and limitations of renewable energy sources?
- (b) Define solar constant. What are the main components of a flat plate solar collector?
- (c) What is the basic principle of wind energy conversion? Name the methods to overcome the fluctuating power generation of windmill.
- (d) What is meant by anaerobic digestion? What are the factors, which affect biodigestion?

- (e) What are the advantages of double flash system? Name the main applications of geothermal energy.
 - (f) What are the advantages of closed cycle OTEC system over open cycle system? Name the difficulties in tidal power developments.
 - (g) What are the advantages and disadvantages of a fuel cell? Name the applications of fuel cell.
2. (a) What is meant by renewable energy sources? Explain in brief these energy sources with special reference to Indian conditions.
- (b) Describe the types of solar power point. What are the limitations of a solar power plant?
3. (a) Define the following terms :
- (i) Altitude angle
 - (ii) Incident angle
 - (iii) Solar azimuth angle
 - (iv) Hour angle
- (b) Why is orientation needed in concentrating type collectors? Describe the different methods of sun tracking briefly.
- (c) Describe with a neat diagram, the operation of solar power plant.

4. (a) Derive the expression for power developed due to wind.
- (b) Describe with a neat sketch, the working of a wind energy system with main components.
5. (a) What is the difference between biomass and biogas?
- (b) How are gasifiers classified? State the potential applications of the gasifier.
- (c) Explain the constructional details and working of KVIC digester.
6. (a) Explain the operation of vapour dominated geo-energy system with a neat schematic diagram.
- (b) What are the possible sources of geothermal pollution? How are these avoided?
- (c) What are the advantages of double flash system?
7. (a) Explain the various methods of power generation in brief from OTEC plant with neat sketches.
- (b) What are the advantages and disadvantages of ocean wave energy?
- (c) Write a short note on wave energy conversion machines.