

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry equal marks.
- (2) Due credit will be given to neatness and adequate dimensions.
- (3) Assume suitable data wherever necessary.
- (4) Illustrate your answers wherever necessary with the help of neat sketches.
- (5) Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.

1. (a) Define the terms :
 - (i) Incident Angle
 - (ii) Zenith Angle

- (b) Describe the 'Closed cycle' OTEC system with its advantages over 'Open Cycle' system. 7

OR

10. (a) What is the difference between power from waves and power from tides ? 6
- (b) Explain with neat sketches the various methods of tidal power generation. 7
11. (a) What do you understand by geothermal energy ? What are Geothermal fields ? 6
- (b) Describe the basic principle of operation of a MHD generation. What are advantages of MHD generating system ? 7

OR

12. (a) Write short note on small scale hydroelectric power generation. 6
- (b) How does biomass conversion take place ? What is difference between biomass and biogas ? 7

(iii) Hour Angle

(iv) Declination Angle

(v) Tilt Angle. 5

- (b) What is the difference between a pyrheliometer and a pyranometer ? Write short note on Angstrom type pyrheliometer. 8

OR

2. (a) What are the reasons for variation in solar radiation reaching the earth and that received outside of the atmosphere ? 7

- (b) Calculate the number of day light hours in Srinagar on January 1 and July 1. The latitude of Srinagar is 35° N. 6

3. (a) What are the advantages and disadvantages of concentrating collector over a flat plate collector ? 7

- (b) Explain energy balance equation and collector efficiency to assess the performance of a solar collector. 7

OR

4. (a) What are the main components of a flat plate collector ? Explain the function of each. 7

- (b) What is the principle of collection of Solar energy used in non-convective solar pond ? Describe a non-convective solar pond for solar energy collection and storage. 7

5. (a) Enumerate the different main applications of solar energy. Describe Solar cooking. 8

- (b) Write short note on Solar pumping. 5

OR

6. (a) Describe a passive solar space heating system. 6

- (b) With the help of neat sketch. describe hot water supply system. 7

7. (a) Describe with neat sketch the working of wind energy system with main components. 7

- (b) Describe the main consideration while selecting a site for wind generators. 7

OR

8. (a) How are WEC system classified ? Discuss in brief. 7

- (b) Derive the expression for power developed due to wind. 7

9. (a) What is the basic principle of Ocean Thermal Energy Conversion (OTEC) ? 6