314306

24225

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

Marks

1. Attempt any FIVE of the following : **10**

(a) State the Primary, Secondary and Tertiary energy sources.

(b) Classify the solar PV-System.

(c) List various components of wind energy system.

(d) State the importance of "Bio-fuels".

(e) Represent simple layout of Micro-Hydro Power (MHP) station.

(f) Enlist domestic and commercial applications of various Bio-fuels.

(g) State advantages and disadvantages of Solar-Biogas Plant.

2. Attempt any THREE of the following : **12**

(a) Explain the working principle of Liquid Flat Plate collector with neat sketch.

(b) Represent the efficiency of various types of collectors as a function of operating temperature.

(c) Explain the working principle of Photo Voltaic cell with neat sketch.

(d) State the Types of "VAWT". Explain the working principle of "Darrieus wind turbine".

3. Attempt any THREE of the following : **12**

(a) Interpret the various aspects of tubular tower, Lattice tower, Free standing tower and Tilt up wind tower.

(b) Write short note on :-

(i) Pelton Wheel Turbine

(ii) Reaction Turbine

(c) Explain the working of hydrogen oxygen fuel cell. Write reactions at cathode and anode along with material aspects.

(d) Explain in lieu of phosphoric acid fuel cells (PAFC's) (i) efficiency (ii) advantages (iii) applications

4. Attempt any THREE of the following : **12**

(a) Represent with neat sketch classification of Bio-fuel by source.

(b) Compare between fixed dome and floating drum on the basis of gas storage, gas pressure, agitation and methane emission.

(c) Explain working principle of Biomass Power Plant with neat sketch.

(d) Explain theory and working principle of OTEC with neat sketch.

(e) Write notes on (i) Thermionic Conversion (ii) Technical and commercial feasibility assessment of renewable energy.

5. Attempt any TWO of the following : **12**

(a) Explain the installation, commissioning and maintenance of Solar roof top system. Draw V-I characteristic for solar cell.

(b) State the criterion for site selection for installing wind turbines. Explain momentum theory application for power extraction from wind.

(c) Represent flow chart for installation procedure of Micro-Hydro Power (MHP) system. Explain maintenance procedure for the MHP-system.

6. Attempt any TWO of the following : **12**

(a) Represent the layout of typical Biomass gasification plant. Explain updraft and downdraft gasifiers.

(b) Compare the hybrid power and solar power on the basis of production design, energy density and battery life.

(c) Explain the following :

(i) Geothermal energy

(ii) Tidal energy

(iii) Grid tied hybrid solar wind energy system.
