22540

11920

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

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

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

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

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

(a) Describe the working of vertical axis wind turbine.

(b) List the power electronic device used in wind turbine.

(c) List any four types of batteries used in solar system.

(d) List any four specifications of power electronic devices used in solar PV system.

(e) List any two advantages and disadvantages of horizontal axis wind turbine.

(f) Write any two safety precautions while doing battery inspection in solar system.

(g) State electrical issues while maintaining wind power sytem.

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

(a) Explain the operation of back to back converter with neat diagram.

(b) Explain the principle of conversion of solar energy into heat with neat sketch.

(c) Describe the working of the charge controller used in solar PV system.

(d) Describe the grid connecting issues with respect to grid integrated solar system.

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

(a) Explain the limitations in the operation of matrix converter.

(b) Describe the importance of maximum power point tracking in the operation of a photovoltaic system.

(c) Describe all the factors to be considered for the selection of inverter and batteries for solar energy conversion.

(d) Describe the functions of components used in solar powered street light system.

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

(a) Describe the features of IGBT used in small wind turbine.

(b) Describe the working principle of the signal conditioner in a solar system.

(c) Describe power configuration for grid connected PV system.

(d) Compare preventive maintenance with reliability centered maintenance.

(e) Explain the factors which affect functional reliability of wind power system.

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

(a) Explain the main considerations in selecting a site for wind power plant.

(b) Describe the working of the soft starter used in wind power plant.

(c) List down advantages and limitations of concentrating collector over flat plate collector.

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

(a) Differentiate Geared wind power plant with direct drive wind power plant.

(b) Compare horizontal axis wind turbine with vertical axis wind turbine with respect to

(i) output power

(ii) starting

(iii) efficiency

(iv) generator and gear box

(c) Draw the schematic diagram of stand alone solar PV system. Describe the function of main components used in it.
