

22540

22232

3 Hours / 70 Marks

Seat No.

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- 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.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

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

**10**

- (a) State the principle of solar PV system.
- (b) State the working principle of wind power plant.
- (c) Draw the symbol of IGBT and GTO.
- (d) List the specifications of power electronic devices used in solar PV systems.
- (e) State the types of batteries used in solar PV system.
- (f) Write four safety procedures while doing battery maintenance.
- (g) Draw direct drive wind turbine.

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

**12**

- (a) Describe the features of the GTO used in small wind turbines.
- (b) Draw the block diagram of wind power plant and explain its working.
- (c) Explain the working of aerodynamic braking of wind turbine.
- (d) Draw and describe the working of horizontal axis wind turbine.



- 3. Attempt any THREE of the following : 12**
- (a) Describe the working of back-to-back converter in wind power plants.
  - (b) Describe the working of the soft starter used in wind power plant.
  - (c) State the four features of roof top home solar system.
  - (d) Explain the necessity of the signal conditioner in a solar PV system.
- 4. Attempt any THREE of the following : 12**
- (a) Describe the functions of components used in solar powered street light system.
  - (b) Discuss the grid connecting issues with respect to grid integrated solar system.
  - (c) Describe the importance of maximum power point tracking in the operation of a photovoltaic system.
  - (d) Explain the features of hybrid wind solar system.
  - (e) Compare geared wind power plants with direct drive wind power plants.
- 5. Attempt any TWO of the following : 12**
- (a) Describe the procedure to troubleshoot the faults of wind power system.
  - (b) Describe the procedure to troubleshoot the faults of solar PV system.
  - (c) Describe the procedure required to select the appropriate inverter for the solar PV system.
- 6. Attempt any TWO of the following : 12**
- (a) Describe the operation and limitations of matrix converter.
  - (b) Compare preventive maintenance with reliability centered maintenance.
  - (c) Describe the working of the charge controller used in solar PV system.
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