

22528

23124

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) 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 types of Tower in WPP.
- (b) Define cut in and nominal power.
- (c) Name any two aerodynamics controls for WPPs.
- (d) Related to WPP, define (i) Survival speed (ii) Threshold speed.
- (e) State any two electronic components used in SWT.
- (f) Name any two forces acting on wind turbine.
- (g) State the India's approximate position in wind power generation in the world.



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

- (a) Explain with neat sketches the specified principle of rotation of wind turbine rotor.
- (b) Draw the basic block diagram of wind energy conversion system.
- (c) Distinguish the specified type of aerodynamic control using the wind power curve.
- (d) Explain the procedure of preventive maintenance of actuators components.

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

- (a) Identify the site and wind characteristics suitable for vertical axis wind turbine.
- (b) Explain the impact of specified problem when connecting the WPP to grid.
- (c) Explain the procedure of unscheduled maintenance of tip, nachele and rotor blades components of WPP.
- (d) Explain the different parts of SWTs.

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

- (a) Explain stall and pitch control for WPP.
- (b) Describe the general maintenance issues of specified vertical axis type of WPP.
- (c) Explain with neat sketch working of direct drive SWT.
- (d) List the activities in minor and major repairs in WPP.
- (e) Distinguish the features of horizontal & vertical axis type of small wind turbines.

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

- (a) Recommend with justification the devices for the following :
  - (i) Increase the speed of SWT.
  - (ii) Detect the direction of wind.
  - (iii) Sense the temperature of generator winding.
- (b) Identify the power electronic devices used in small wind turbines with justification.
- (c) Explain the scheduled maintenance procedure of oil and greasing.

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

- (a) Draw a neat layout of WPP substation, with labelling. State the function of each component.
  - (b) State the location and function of any six sensors used in large WPP.
  - (c) Define actuator. Explain with a neat labelled diagram hydraulic pitch control of large WPP.
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