

22528

11920

3 Hours / 70 Marks

Seat No.

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- 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.
 - (5) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following :

10

- (a) State the factors which affect the nature of the wind close to the surface of the earth.
- (b) State approximate wind power generation in India.
- (c) List any two advantages of vertical axis WPPs.
- (d) Name any two aerodynamic controls for WPP.
- (e) Identify any two weekly maintenance activities for WPP.
- (f) Give the classification of SWT on any two factors.
- (g) Name any two power electronic components in SWT.

2. Attempt any THREE of the following :

12

- (a) List any four towers related to WPP. Explain any one in brief.
- (b) Draw basic block diagram of wind energy conversion system.
- (c) List various types of generators used in WPPs.
- (d) Prepare maintenance schedule of various actuators used in large wind power plants.

- 3. Attempt any THREE of the following : 12**
- (a) Draw a block diagram of WPP substation. State function of each block.
 - (b) Explain lift & drag wind energy conversion principle.
 - (c) Explain working of doubly fed induction generator.
 - (d) Name any four main parts of SWT. Give function of each part.
- 4. Attempt any THREE of the following : 12**
- (a) Related to WPP define following wind speeds –
 - (i) Cut in
 - (ii) Cut out
 - (iii) Survival
 - (iv) Threshold
 - (b) Describe the general maintenance issues of the horizontal axis WPPs.
 - (c) Describe with sketch Lattice tubular type & hydraulic towers for SWT.
 - (d) Recommend with justification the generators used in SWT.
 - (e) List any four mechanical and electrical faults in SWT.
- 5. Attempt any TWO of the following : 12**
- (a) Identify the sensors for the following :
 - (i) Wind speed
 - (ii) RPM of generator shaft
 - (iii) Temperature in generator
 - (iv) Cable untwisting
 - (v) Vibration
 - (vi) Wind direction
 - (b) Recommend & explain with neat sketch a suitable braking mechanism for the large WPP.
 - (c) Identify & explain any two difficulties faced while connecting WPP to the power grid.
- 6. Attempt any TWO of the following : 12**
- (a) Explain scheduled maintenance of stall pitch, active pitch controlled WPP.
 - (b) Explain with neat sketch working of direct drive SWT. Give any two advantages of it over geared type SWT.
 - (c) Prepare preventive maintenance schedule for SWT related to –
 - (i) oiling and greasing
 - (ii) electronic equipment
 - (iii) towers
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