22528

23242

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

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

(2) Answer each Section on same / separate answer sheet.

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

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

(5) Figures to the right indicate full marks.

(6) Assume suitable data, if necessary.

(7) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

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

(a) State the wind power scenario in world. Name top two countries.

(b) Define cut in, cut-out wind speeds.

(c) Name any two aerodynamic controls for WPPS.

(d) List any two weekly maintenance activities of WPP.

(e) Name types of generator used in SWT.

(f) Identify the power electronic devices used in SWT.

(g) Recommend the devices used for the following :

(i) Increase the speed of SWT

(ii) Sense the temperature of the generator winding.

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

(a) Describe the salient features of Horizontal type of WPPs.

(b) Explain with neat sketches drag and lift principle of wind turbine rotor.

(c) Draw and explain Doubly Fed Induction Generator (DFIG) used in large WPPs.

(d) Explain procedure of preventive maintenance of vertical axis type WPP.

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

(a) Explain working of squirrel cage induction generator used in WPP.

(b) Compare SCIG and PMSG used in WPPs on the basis of :

(i) Reactive Power Control

(ii) Construction

(iii) Speed control

(iv) Output

(v) Applications

(vi) Cost

(c) Explain the different parts of SWT's.

(d) Describe the installation of specified SWT.

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

(a) Explain the need for specified component of electric substation.

(b) Describe lattice tubular types feature of SWT towers with neat sketches.

(c) State the functions of the following parts in WPP :

(i) Tower

(ii) Nacelle

(iii) Hub

(iv) Gear box

(v) Generator

(vi) Anemometer

(d) Identify the type of wind turbine which can be built without yaw mechanisms. Explain detection of wind direction in it.

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

(a) State the function and location of any six sensors used in large WPPs.

(b) Identify and explain any two difficulties faced while connecting WPP to the grid.

(c) Explain with neat sketch working of direct drive SWT. Give any two advantages of it over geared type SWT.

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

(a) Explain with necessary sketches the braking mechanism for large type wind turbine.

(b) (i) List the type of maintenance required for maintaining large WPPs.

(ii) Plan preventive maintenance schedule of Yaw Control actuators for large WPPs.

(c) (i) Give the classification of SWT on any two factors.

(ii) Compare horizontal axis and vertical axis SWTs on any four points.