Question Bank (I- scheme) Unit Test I

Course: Wind Power Technology

Code: (22528) **Abbreviation - WPT**

Semester: 5I **Program: EE**

UNIT I: WIND ENERGY & WIND POWER PLANTS (08 M)

2 Marks Questions:

1) State India's approximate position in wind power generation in the world.
2) State the various types of wind power plants.
3) List two characteristics of wind related to WPP.
4) Suggest the sensors for sensing speed and direction of wind.
5) List any four switchgears used in a WPP sub-station.
6) List any four types of towers used in WPP.
7) State the factors which affect the nature of the wind close to the surface of the earth.

8) State approximate wind power generation in India.

9) State the factors which affect the nature of the wind close to the surface of the earth.

4 Marks Questions:

10) Explain the specified characteristics of the wind related to wind power generation.

11) Define cut-in and cut-out speed of WPP with neat labeled graph. Give specific value of each.

12) Classify WPPs on any four points.

13) Draw basic block diagram of wind energy conversion system.

14) Draw a block diagram of WPP substation. State function of each block.

UNIT II: CONSTRUCTION & WORKING OF LARGE WIND POWER PLANTS (12M)

2 Marks Questions:

15) Identify the capacity and tower type suitable for horizontal axis wind turbine.

16) Name any two forces acting on wind turbine.

17) Name any two aerodynamic controls for WPPs.

4 Marks Questions:

18) Explain the stall and pitch control for WPP.

19) Justify the need, location and working of any three sensors used in WPPs.

20) Related to WPP define following wind speeds –

(i) Cut in

(ii) Cut out

(iii) Survival
(iv) Threshold

21) Explain Drag and Lift rotation principle of WPP.

22) State function and location of any four sensors used in large WPP.

23) State meaning of following characteristics of wind energy:

(i) Wind movement (ii) Wind profile (iii) Roughness (iv) Obstacle in wind path

24) State function of following parts of WPP:

i) tower, (ii) nacelle, (iii) hub, (iv) blades, (v) gear box (vi) generator.

25) List any four towers related to WPP. Explain any one in brief.

26) 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

UNIT III: AERODYNAMIC CONTROL, ELECTRIC GENERATORS & GRID CONNECTION (16M)

2 Marks Questions:

27) Name any two aerodynamic controls for WPPs.

28) Select appropriate actuators for pitching and yawing mechanism.

29) Name two aerodynamic control mechanisms for WPP.

30) Name any two breaking mechanisms for large WPPs

31) List any two advantages of vertical axis WPPs.

4 Marks Questions:

32) Identify appropriate type of actuators for pitching and yawing control for horizontal WPP.

33) List various types of generators used in WPPs.

34) Explain the working of squirrel cage induction generator.

35) Explain with sketches the braking mechanism for large type wind turbine.

36) List two advantages and two disadvantages each of DFIG used in WPP.

37) Explain about local impacts of electrical grid connection of WPP.

38) Explain with block diagram working of direct drive type SWT.

39) Compare horizontal and vertical axis SWT on any four points.

40) Compare SCIG and PMSG used in WPPs on the basis of cost, construction, speed control, reactive power control, output and application.

41) Recommend & explain with neat sketch a suitable braking mechanism for the large WPP.

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

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