ST.ANNE'S

COLLEGE OF ENGINEERING AND TECHNOLOGY

EE8703 - RENEWABLE ENERGY SYSTEMS
UNIT 2 – WIND ENERGY

1. What does Heating and cooling of the atmosphere generates?

a) Thermo line circulation

b) Radiation currents

c) Convection currents

d) Conduction currents

2. How much is the energy available in the winds over the earth surface is estimated to be?

a) 2.9 X 120 MW

b) 1.6 X 107 MW

c) 1 MW

d) 5MW

3. How much wind power does India hold?

a) 20,000 MW

b) 12,000 MW

c) 140,000 MW

d) 5000 MW

4. What is the main source for the formation of wind?

a) Uneven land

b) Sun

c) Vegetation

d) Seasons

5. Which country created wind mills?

a) Egypt

b) Mongolia

c) Iran

d) Japan

6. "During the day, the air above the land heats up more quickly than the air over water".

a) True

b) False

7. What happens when the land near the earth's equator is heated?

a) All the oceans gets heated up

b) Small wind currents are formed

c) Rise in tides

d) Large atmospheric winds are created

8. What type of energy is wind energy?

a) Renewable energy

b) Non-renewable energy

c) Conventional energy

d) Commercial energy

9. What are used to turn wind energy into electrical energy?

a) Turbine

b) Generators

c) Yaw motor

d) Blades

10. What is the diameter of wind turbine blades?

a) 320 feet

b) 220 feet

c) 80 feet

d) 500 feet

11. At what range of speed is the electricity from the wind turbine is generated?

a) 100 – 125 mph

b) 450 – 650 mph

c) 250 – 450 mph

d) 30-35 mph

12. When did the development of wind power in India began?

a) 1965

b) 1954

c) 1990

d) 1985

13. Why is the energy output of wind power plant variable?

a) Wind speed is variable

b) Wind speed is an unknown constant

c) Wind speed is known constant

d) Poor equipment is used

14. Which of the following is a reason for variable wind speed?
a) Water
b) Earth's rotation
c) Electrons
d) Fans

15. What is grid integration of wind energy?
a) Planning the connection of wind power plant to the grid
b) Physical connection of wind power plant to the grid
c) Energy sent from grid to run the wind turbines
d) Collection of all activities related to connecting wind power plants to the grid

16. Which of the following depicts the correct order of the stages involved in grid integration of wind energy?
a) System operations → physical connection → planning
b) Planning → system operations → physical connection
c) Planning → physical connection → system operations
d) Physical connection → planning → system operations

17. What are the two types of planning activities related to grid integration?
a) Network-wide and project-specific
b) BJT and MOSFET
c) Rotor and shaft
d) Low power and high power designs

18. Which of the following best describes network-wide planning activity in grid integration?
a) Planning activities related to a unique wind project
b) Planning activities for all the future wind power plants
c) Planning activities for a telecommunication system
d) Planning activities for the maintenance of the existing wind power plants

19. Network-wide plans in wind energy grid integration include _____
a) system impact studies done for a specific wind project
b) materials used to manufacture wind turbine blades
c) developing grid code
d) solar panel manufacturing plant

20. What is project specific planning in wind energy grid integration?
a) Planning activities for a solar panel system
b) Planning activities for all the future wind power plants
c) Planning activities related to a unique wind project
d) Planning activities for the maintenance of the existing thermal power plants

21. In a substation, the wind power plant line is connected to a _____ voltage bus bar.
a) high
b) low
c) mini
d) medium

22. Which of the following are a few primary tests performed after commissioning phase in the physical connection stage?
a) Switch-gear functioning and quality parameters
b) Feathering
c) Wind turbine blade tests
d) Rotor and shaft tests

23. Which of the following are impacts of grid integration of wind power plant?
a) Day-ahead unit commitment process
b) Day-ahead unit commitment process, economic dispatch process
c) Generator types
d) Rotor and shaft tests

24. Which of the following is/are good practices for grid integration of wind power plant?
a) Day-ahead unit commitment process
b) Day-ahead unit commitment process, economic dispatch process
c) Optimized transmission from resources-rich areas to load, flexible generation
d) Rotor and shaft tests

25. What is a grid code for wind energy integration?
a) A binary code
b) A hexadecimal code
c) A code of conduct
d) A rulebook specifying generator properties

26. What are the types of grid integration costs?
a) Transmission extension, volatility balancing, covering peak load
b) Marginal cost
c) Fixed cost
d) Fundamental Analysis

27. What is a power flow study in wind energy integration?
a) A binary code
b) Determines flow of electrical energy from generators to consumers
c) Determines flow of electrical energy from generators to consumers meeting line loading

requirements

d) A study specifying generator properties

28. The amount of energy available in the wind at any instant is proportional to ___ of the wind speed.
a) Square root power of two
b) Square root power of three
c) Square power
d) Cube power

29. Wind energy is harnessed as _____ energy with the help of windmill or turbine.
a) Mechanical
b) Solar
c) Electrical
d) Heat

30. The following is (are) the classification of winds
a) Global wind
b) Local wind
c) Both (a) and (b)
d) None of the above

31. Global Cold wind move from
a) Polar to equatorial region
b) Equatorial to polar region
c) Equatorial to oceanic region
d) Oceanic to Equatorial region

32. Global Cold wind generated from Oceans moves to
a) Mountains
b) Equator
c) Plain areas
d) Poles

33. _____ force is responsible for forcing the global winds towards westernly direction.
a) Coriolis
b) Gravitational
c) Centripetal
d) Centrifugal

34. Global winds towards westernly direction are known as
a) Trade winds
b) Western winds
c) Eastern winds
d) None of the above

35. Uneven heating occurs on land surface and water bodies are due to _____
a) Air Currents
b) Solar radiation
c) Lunar eclipse
d) None of the above

36. The following factor(s) affects the distribution of wind energy
a) Mountain chains
b) The hills, trees and buildings
c) Frictional effect of the surface
d) All of the above

37. The wind intensity can be described by
a) Reynolds number
b) Mach number
c) Beaufort number
d) Froude number

38. Why severe fluctuations in power are always undesirable in windmill?
a) **Because they pose power oscillations problems**
b) Damage of parts due to fluctuations
c) The efficiency of the plant will be reduced
d) Results in damage to the whole plant

39. In which of the following, does machine rotor drives through a step up gear box?
a) **Horizontal axis with two aerodynamic blades**
b) Horizontal axis propeller type wind mill
c) Horizontal axis multi bladed type wind mill
d) Sail type wind mill

40. Which type of wind machines are used at several residence or local use?
a) Large size machines
b) Remote machines
c) Small size machines
d) **Medium size machines**

41. Which windmill blades are made by an array of wooden slats?
a) Horizontal axis with two aerodynamic blades
b) Horizontal axis propeller type wind mill
c) Horizontal axis multi bladed type wind mill
d) **Horizontal axis wind mill Dutch type**

42. Which type of wind turbines produce 100 kW or greater?
a) **Large machines**
b) Small machines

c) Medium machines
d) Remote Machines

43. The rotor blades are continuously flexed by unsteady aerodynamic gravitational and inertia loads?
a) **True**
b) False

44. Aero turbine is the fraction of power in the wind through the swept area which is converted into useful mechanical shaft power is called _____
a) **Coefficient of performance**
b) Coefficient of variation
c) Coefficient of lift
d) Coefficient of spin

45. Why is wind turbine designed to stop operation at cut out velocity?
a) **To protect wheel against damage**
b) To make a quick stop in emergencies
c) To improve the efficiency
d) In order to adjust the blades to wind direction

46. Which type of wind turbine has low RPM?
a) Small wind turbine
b) **Large wind turbine**
c) Medium wind turbine
d) Remote wind turbine

47. Which type of generator are made use in wind turbines?.
a) Recreational generators
b) **Synchronous generator**
c) Asynchronous generator
d) Alternator

48. Why is Savonius rotor not suitable for installation?
a) **Because of long drive shaft**
b) Because of its low capacity motor
c) Because of its typical blade design
d) Due to the light material it is made of

49. What happens when the land near the earth's equator is heated?
a) All the oceans gets heated up
b) Small wind currents are formed
c) Rise in tides
d) **Large atmospheric winds are created**

50. Which type of vertical wind machine has relatively low solidity and low starting torques?

a) Cup anemometer
b) Savonius rotor
c) **Darrieus type rotor**
d) Magnus effect rotor

51. A rotor installed in a fixed orientation with the swept area perpendicular to the pre dominate wind direction is called _____

a) Nacelle
b) **Yaw fixed machines**
c) Blades
d) Anemometer

52. What type of cross sections does wind turbine blades have?

a) Penta hedral cross section
b) **Air foiled type cross section**
c) Radar cross section
d) Turbo cross section

53. Which part of the wind turbines senses wind speed, wind direction, shaft speed and torque?

a) Turbine blade
b) Shaft
c) Rotor
d) **Controller**

54. What units does the anemometer measure in?

a) **Feet per minute**
b) Liters per minute
c) Centimeters per minute
d) Meter per seconds

55. A wind turbine designed too to come into operation at a minimum wind speed is called _____

a) **Cut in velocity**
b) Windward
c) Cut out velocity
d) Upwind location