Electrical Power Generation

Wind Power Plant

1. What is the main source for the formation of wind?
   a) Uneven land
   b) Sun
   c) Vegetation
   d) Seasons

2. What type of energy is wind energy?
   a) Renewable energy
   b) Non-renewable energy
   c) Conventional energy
   d) Commercial energy

3. What are used to turn wind energy into electrical energy?
   a) Turbine
   b) Generators
   c) Yaw motor
   d) Blades

4. How much power does the small scale wind machine generate?
   a) 18 KW
   b) 2 KW
   c) 12 KW
   d) 30 KW

5. 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

6. Which type of wind turbines produce 100 kW or greater?
   a) Large machines
   b) Small machines
   c) Medium machines
   d) Remote Machines

7. Which part of the wind mill acts as a housing for the turbine?
   a) Wind Vane
   b) Shaft
   c) Wind mill head
   d) Turbine

8. Which part of the wind turbines senses wind speed, wind direction, shaft speed and torque?
   a) Turbine blade
   b) Shaft
   c) Rotor
   d) Controller

9. How is the action of yaw controlled in small turbines?
   a) Tail vane
   b) Blades
   c) Shaft
   d) Yaw motor

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

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

12. In which part do we find sensors and actuators?
   a) Fixed gears
   b) Turbines
   c) Control systems
   d) Blades

13. How many types of supporting tower for wind mill are generally used?
   a) 2
   b) 4

c) 3
d) 5

14. On what does the selection of supporting structure depends?
    a) Length of blades
    b) Rotating capacity
    c) Capacity of generator
    d) Transmission systems

15. . How much ideal efficiency should practical turbine have?
    a) 10 – 12%
    b) 18 – 25%
    c) 80 – 90%
    d) 50 – 70%

16. What is the inherent weakness of all wind machines?
    a) Their efficiencies
    b) Requires powerful winds to make fan rotate
    c) Their dependency on the wind speed
    d) Cannot be easily repaired

17. 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

18. 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

19. 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

20. 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

21. Which type of the following consists of single blade?
    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

22. Which is the device that measures wind direction and its intensity?
    a) Wind socks
    b) Weather vane
    c) Pin wheels
    d) Anemometers

23. What units does the anemometer measure in?
    a) Feet per minute
    b) Liters per minute
    c) Centimeters per minute
    d) Meter per seconds

24. . How much wind power does India hold?
    a) 20,000 MW
    b) 12,000 MW
    c) 140,000 MW
    d) 5000 MW

25. "During the day, the air above the land heats up more quickly than the air over water".
    a) **True**
    b) False

26. 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

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

28. Winds having following speed are suitable to operate wind turbines.
    a) 5 – 25m/s
    b) 10 – 35m/s
    c) **20 – 45m/**s
    d) 30 – 55m/s

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

30. Where would you most likely find a wind farm?
    a) Right outside a city
    b) In the suburbs
    c) On open desert land
    d) In the center of a forest

31. What are the benefits of wind power:
    a) It does not produce greenhouse gases
    b) The wind is limitless
    c) It is cheap to maintain
    d) All of the above

32. Which of these traits do wind turbines have in common with traditional power plants?
    a) Produce greenhouse gas emissions
    b) Ability to produce power at any time
    c) Use an electrical generator
    d) Use a fuel source

33. Local winds are caused by

    a) differential heating of land and water

    b) differential heating of plains and mountains

    c) any of the above

    d) none of the above

34. The disadvantage of renewable sources of energy is

    a) lack of decidability

b) availability in low energy densities

c) intermittency

d) all of the above.

35. What causes wind?

a) Rotation of the Earth

b) The Sun heating the atmosphere

c) Variations in the Earth's surface

d) All of the above

36. Which of these is NOT a part of a modern wind turbine?

a) Compressor

b) Gearbox

c) Nacelle

d) Yaw drive

37. Roughly how tall are most utility-scale wind turbine towers in the india.?

a) 65 meters (213 feet)

b) 114 meters (374 feet)

c) 88 meters (289 feet)

d) 140 meters (460 feet)

38. The following is (are) the classification of wind

a) Global wind
b) Local wind
c) Both (A) and (B)
d) None of the above

39. The rate of change of wind speed with height is called
a) Wind gradient
b) Wind rose
c) Wind solidity
d) None of the above

40. Low solidity rotors use which of the following force for rotation.
a) Drag
b) Lift
c) Centrifugal
d) Centripetal

41. Turbines blades have ____ type cross section to extract energy from wind.
    a) Aerofoil
    b) Elliptical
    c) Rectangular
    d) All of the above

42. Wind speed is measured by tachometer – false

43. Gearbox is used in wind mill- true

44. Wind energy is pollution free energy – true

45. Wind vane gives the directions of wind – true

46. Anemometer gives the directions of wind – false

47. Anemometer is used for measured the temperature of wind – false

48. Compressor is used in wind turbine – true

49. Wind energy is commercial energy – false

50. Wind energy available 365 days - false

Nuclear power plant

1. The best capable alternative source which can meet the future energy demand is _____
   a) thermal power plant
   b) nuclear power plant
   c) hydroelectric power plant
   d) geothermal power plant

2. How much coal is required to generate energy equivalent to the energy generated by 1 kg of uranium?
   a) 30000 tonnes of high grade coal
   b) 300 tonnes of high grade coal
   c) 10000 tonnes of high grade coal
   d) 3000 tonnes of high grade coal

3. Nuclear fuel in reactor lasts for _____
   a) more than 5 months
   b) few weeks
   c) few days
   d) more than 5 years

4. Cost of nuclear fuel in nuclear power plant economics is considered as _____
   a) running cost
   b) maintenance cost
   c) capital cost
   d) development cost

5. In economics of nuclear power plant taxes and insurance charges are taken as _____
   a) operating cost
   b) maintenance cost
   c) capital cost
   d) fixed cost

6. What is the overall efficiency of nuclear power plant?
   a) 20 to 25%
   b) 25 to 30%
   c) 30 to 40 %
   d) 50 to 70 %

7. The land area required for installation of nuclear power plant is _____
   a) more than thermal power plant
   b) less than thermal power plant
   c) equel to thermal power plant
   d) depends on type of construction

8. All of the nuclear fuel reserve will be ended in about 400 years.
   a) True
   b) False

9. With respect to the load centre which location is suitable for stablishment of nuclear power plant?
   a) Load centre
   b) Near load centre but at reasonable distance
   c) Far away from load centre
   d) Near chemical industries

10. Operating cost of nuclear power plant is less than thermal power plant.
   a) True
   b) False

11. In nuclear power stations which nuclear reaction is performed?
   a) Nuclear fission
   b) Nuclear fusion
   c) 90% fission and 10% fusion
   d) 90% fusion and 10% fission

12. Which particle is bombarded on heavy nucleus of nuclear fuel?
   a) Electron
   b) Proton
   c) Neutron
   d) Photon

13. The critical mass for U235 fission reaction is about _____
   a) 100Kg
   b) 200 Kg
   C) 50 kg
   d) 10 kg

14. The fuel mainly used in nuclear fission reactors are:
   a) U235
   b) U239
   c) U233
   d) U238

15. Which fissionable nuclear fuel occur in nature?
   a) Plutonium
   b) Thorium
   c) Uranium
   d) 94239 Pu

16. Which of the following has high fission percentage?
   a) Pu239
   b) U233
   c) U235

d) U234

17. Reactors used for converting fertile materials to fissile materials are called _____
    a) research and development reactor
    b) production reactor
    c) power reactors
    d) slow reactors

18. Which statement about fast reactor is true?
    a) These reactors are big in size so not easier to shield
    b) Fast reactors can convert fertile materials to fissile materials
    c) Fast reactors are easy to control
    d) Heat transfer and cooling is very easy and simple

19. In which part of nuclear power plant steam is produced?
    a) Boiler
    b) Heat exchanger
    c) Chamber across the reactor
    d) Air preheater

20. What is the main function of moderator?
    a) It absorb the extra neutrons
    b) It divert extra neutrons
    c) It slow down the speed of fast neutrons
    d) It absorb the heat energy caused by nuclear reaction

21. Which of the following material is not used as moderator?
    a) Oxygen
    b) Ordinary water
    c) Heavy water
    d) Graphite

22. Which of the following part of nuclear reactor is used to control the rate of reaction.
    a) Moderator
    b) Control rods
    c) Reflector
    d) Coolant

23. Which of the following is the most essential requirement of control rod material?
    a) It must be light weight
    b) It must be cheap
    c) It must have high absorption capacity for neutrons
    d) It must be very reflective to neutrons

24. Which of the following can be used as both as coolant and moderator ?
    a) Helium
    b) Molten sodium
    c) Lithium

d) Ordinary water

25. In thermal reactors control is very easy in comparison to other reactors.
    a) True
    b) False

26. The main body of reactor is called _____
    a) Thermal shielding
    b) Reactor vessel
    c) Reflector
    d) Biological shielding

27. Reactors used for electricity generation are called _____
    a) Research and development reactors
    b) Production reactors
    c) Power reactors
    d) Electron reactors

28. What is the difference in size of thermal reactor and fast reactor?
    a) Size of thermal reactor is slightly more than size of fast reactor
    b) Size of thermal reactor is slightly less than size of fast reactor
    c) Size of thermal reactor is very much larger than size of fast reactor
    d) Both are of same size

29. Which of the following reactors does not need moderator?
    a) Thermal reactor
    b) Fast reactor
    c) Intermediate reactor
    d) Power reactor

30. Heat energy generated in per unit volume of reactor core in thermal reactor is _____
    a) less than that in fast reactors
    b) more than that in fast reactors
    c) equal to that and fast reactors
    d) unpredictable

31. In which of the following reactors material converted into fissile materials is more than fissile material consumed?
    a) Burner reactor
    b) Slow reactors
    c) Converter reactor
    d) Breeder reactor

32. Which of the following reactors uses its fuel as coolant?
    a) Direct reactor
    b) Indirect reactor
    c) Both direct and indirect reactor
    d) Solid fuel reactor

33. Which of the following statement is true?
I. In homogeneous reactors the nuclear fuel and the moderator represents a uniform mixture in the fluid form.
II. In heterogeneous reactors separate fuel sludge or roads are inserted in the moderator
III. Most of the nuclear reactors used these days are of homogeneous type
a) Only statement I and II are true
b) Only statement I and III are true
c) Only statement II and III are true
d) Only statement III is true

34. In which of the following reactor it is possible to add remove and process the reactor fuel during reactor operation?
a) Homogeneous reactor
b) Heterogeneous reactor
c) Solid fuel reactor
d) Both homogeneous and heterogeneous reactors

35. In which of the following reactors fissile and fertile materials are kept separate?
a) In one region reactor
b) In two region reactor
c) In one and two region reactor
d) It is impossible to separate them

36. Any leakage or component failure in primary nuclear fission reactor coolant system is dangerous.
a) True
b) False

37. In all plant minimum quality of fuel is required in.....
a) Thermal power plant
b) Hydro power plant
c) Nuclear power plant
d) Gas turbine power plant

38. The nuclear energy is measured as.....
a) MeV
b) MW
c) Curie
d) None of the above

39. The efficiency of a nuclear power plant in comparison to a conventional thermal power plant is
a) same
b) More
c) Less
d) Unpredictable

40. Isotopes of same elements have
a) same atomic number and different masses

b) same chemical properties but different atomic numbers
c) different masses and different atomic numbers
d) None of the above

41. Atomic number of an element in the periodic table represents the numbers of
a) protons in the nucleus
b) electrons in me nucleus
c) neutrons in the nucleus
d) electrons in the atom

42. The mass number of a substance represents the sum of total number of
a) protons and neutrons in a nucleus
b) protons and electrons in a nucleus
c) protons and neutrons in an atom
d) protons and electrons in an atom

43. Which is not identical for an atom and an isotope
a) mass number
b) atomic number
c) chemical properties
d) position in periodic table

44. The most commonly used moderator in nuclear plants is
a) heavy water
b) graphite
c) deuterium
d) None of the above

45. The total energy released in fission of U is
a) 5 MeV
b) 10 MeV
c) 199 MeV
d) 168 MeV

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a) 5 MeV
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c) 199 MeV
d) 168 MeV

47. Which of the following are ferrite materials
a) U233andPu239
b) U
c) U238andPu239
d) U238andTh239

48. Which of the following particles is the lightest
a) nucleus
b) electron

c) proton
d) meson

49. Which of the following particles is the lightest
a) nucleus
b) electron
c) proton
d) atom

50. The first unclear power plant in India is located at
a) kota
b) Tarapur
c) Kerala
d) Kakrapar

Captive power plant

1. What is the air standard cycle for a Gas-Turbine called?
a) Reheat cycle

b) Rankine cycle
c) Brayton cycle
d) Diesel cycle

2. What is the difference between a Rankine cycle & a Brayton cycle?
a) working fluid in a Brayton cycle undergoes phase change while it doesn't in Rankine cycle
b) working fluid in a Brayton cycle doesn't undergo phase change while it does in Rankine cycle
c) both are same
d) none of the mentioned

3. Which of the following is a type of Gas Turbine Plant?
a) Single Acting
b) Double Acting
c) Open
d) None of the mentioned

4. Cold air is used in gas power plant - false

5. A Gas Turbine is which type of combustion plant?
a) external
b) open
c) internal
d) cannot say

6.Which among these is the main component of a gas turbine plant?
a) Condenser
b) Compressor
c) Boiler
d) Both (b) & (c)

7. compressor is used for reheat the air in gas power plant- false

8. What part or % of power developed is utilised for driving the compressor?
a) 65 %
b) 70 %
c) 55 %
d) 80 %

9. The gas turbine power plant mainly uses which among the following fuels?
a) Coal and Peat
b) Kerosene oil and diesel oil and residual oil

c) Gas oil
d) Natural gas and liquid petroleum fuel.

11. The installation time for a gas turbine power plant is _____
a) Comparatively less than thermal power plant
b) Comparatively more than thermal power plant
c) Equal to thermal power plant
d) Very much longer than thermal power plant

12. Which of the following is not used in gas turbine power plant?
a) Compressor
b) Turbine
c) Combustion chamber
d) Condenser

13. Which component of gas turbine power plant is main cause of its low efficiency?
a) Gas turbine
b) Combustion chamber
c) Compressor
d) Starting motor

14.What is intercooling in gas turbine power plant?
a) Removal of heat from combustion gas between stages of turbine
b) Removal of heat from compressor between stages of compressor
c) Removal of heat from intake air
d) Removal of heat from exhaust air

15. What is the function of regenerator?
a) Batery compresses the exhaust gases
b) It heats the compressed air
c) It regenerates the combustible gas from exhaust gas
d) It regenerates the combustible oil from exhaust gas

16. Fuel other than natural gas i.e. solid and liquid fuels can be used in _____
a) open cycle gas turbine power plant
b) closed cycle gas turbine power plant
c) open and closed cycle gas turbine power plant
d) only natural gas is used in gas turbine power plant

17. Which of the following gas turbine power plant can use working medium of required property?
a) Closed cycle gas turbine power plant
b) Open cycle gas turbine power plant
c) Open and closed cycle gas turbine power plant
d) No gas turbine power plant can use working medium of required property.

18. The term biomass most often refers to _____
a) Inorganic matter
b) Organic matter
c) Chemicals
d) Ammonium compounds

19. Dead organisms are also comes under the biomass.
a) True
b) False

20. Biomass is useful to produce _____
a) Chemicals
b) Fibres
c) Biochemicals
d) Energy fuels

21. Heat exchanger is used for heating the air in gas power plant - yes

22. compressor is used for compressed the air - true

23. _____ is called as the bio gas.
a) Bio ethanol
b) Bio methane
c) Bio diesel
d) Bio butanol

24. The ocean thermal energy conversion(OTEC) is uses _____
a) Energy difference
b) Potential difference
c) Temperature difference
d) Kinetic difference

25. The by-product of the ocean thermal energy conversion is _____
a) Hot water
b) Cold water
c) Chemicals
d) Gases

26. In ocean thermal energy conversion, the plant pumps the deep cold sea water and do not pump the surface sea water.
a) True
b) False

27. Warm surface sea water is pumped through a _____ to vaporise the fluid.
a) Heat exchanger
b) Generator

c) Evaporator
d) Condenser

28. The heat exchanger _____ the vapour into a liquid which is recycled.
a) Condenses
b) Heats
c) Cools
d) Evaporates

29. Open cycle OTEC uses _____ surface water directly to make electricity.
a) Hot
b) Warm
c) Cool
d) Icy

30. In some cases, the steam drives the low pressure turbine attached to the electrical generator.
a) True
b) False

31. The steam leaves the _____
a) Salts
b) Aluminum
c) Copper
d) Silver

32. The open cycle system produces _____ water.
a) Desalinated
b) Impure
c) Contaminated
d) Chlorinated

33. In _____ method the sea water enters a vaccum chamber and flash evaporated.
a) Closed cycle system
b) Open cycle system
c) Hybrid OTEC
d) Neither closed nor open system

34. Depending on the embodiment _____ technique generate power from hydro electric turbine.
a) Closed cycle
b) Open cycle
c) Hybrid
d) Steam lift pump

35. Tidal energy is a form of _____
a) Wind power

b) Solar power
c) Heat energy
d) Hydro power

36. Tidal energy has _____ for future electricity generation.
a) Kinetic energy
b) Potential
c) Wind power
d) Solar power

37. Which of the following is the best form of energy that can be used at any time.
a) Wind energy
b) Solar energy
c) Tidal energy
d) Heat energy

38. Tidal power plant is like hydro power plant – true

39. Tidal power is renewable power - true

40. Tidal power is practically _____
a) Exhaustible
b) Inexhaustible
c) Not possible
d) Complicated

41. Movement of tides causes the loss of _____ in earth moon system.
a) Static energy
b) Frictional energy
c) Mechanical energy
d) Kinetic energy

42. The loss of mechanical energy due to movement of tides in earth moon system causes the rotation of earth _____
a) Slow
b) Fast
c) Very fast
d) Remains same

43.single basin is part of tidal power plant - true

44. Tidal power plant produce large amount of energy - false

45. Tidal power is taken from earth's _____ tides.
a) Sea

b) Oceanic
c) Other water sources
d) River

46. In how many types the tidal power is generated?
a) 1
b) 2
c) 3
d) 4

47. The kinetic energy is used to make power in _____ method.
a) Tidal lagoon method
b) Dynamic tidal power
c) Tidal barrage method
d) Tidal steam generator

48.The both potential and kinetic energy is used in _____ method.
a) Dynamic tidal power
b) Tidal lagoon method
c) Tidal barrage method
d) Tidal steam generator

49. The turbines in the tidal steam generator are placed at _____ of water column.
a) Bottom
b) Top
c) Right side
d) Left side

50. The reservoirs that are similar to the tidal barrages are created in tidal lagoon method and those are called as _____
a) Lagoons
b) Wells
c) Pots
d) Tanks