MODULE 2
ADVANCES IN ENERGY SYSTEM AND NATURAL RESOURCE MANAGEMENT

1. Which of the following supplies maximum amount of hydrogen gas?
a) Natural gas
b) Anaerobic Digestion
c) Wastewater treatment
d) Electrolysis
Answer: a

2. In terms of greenhouse gas emissions, how good or bad is hydrogen fuel?
a) Major contributor of greenhouse gas emissions
b) Zero-emission fuel
c) Lowest contributor of greenhouse gas emissions
d) Hydrogen cannot be used as fuel
Answer: b

3. Which of the following use hydrogen as fuel?
a) Fossil fuels
b) Anaerobic digestion
c) Fuel cells
d) Cooking
Answer: c

4. Which of the following is the most popular application of hydrogen fuel cell?
a) Fuel cell vehicles
b) Fuel cell energy power plants
c) Fuel cells stand-alone power supplies
d) Fuel cells spacecraft
Answer: d

5. How is hydrogen gas produced from fossil fuels?
a) Partial oxidation of methane
b) Electrolysis
c) Evaporation
d) Biomass gasification
Answer: a

6. What is the major drawback of steam-methane reforming technique to produce hydrogen?
a) Capital intensive

b) Releases greenhouse gases into atmosphere
c) A niche technology
d) Poor efficiency
Answer: b

7. How does electrolysis produce hydrogen?
a) By running electricity to combine hydrogen and water
b) By separating water into hydrogen and oxygen and generating electricity
c) By passing electricity into water to separate it into hydrogen and oxygen
d) By passing electricity into water to evaporate it into hydrogen
Answer: c

8. Why is hydrogen hazardous as fuel?
a) Because of high ignition and low combustion energy
b) Because of high ignition and high combustion energy
c) Because low ignition and low combustion energy
d) Because of low ignition and high combustion energy
Answer: d

9. Traditionally, why is steam methane reforming preferred over electrolysis?
a) Because electrolysis requires electricity
b) Because electrolysis has lower production efficiency
c) Because steam methane reforming produces greenhouse gases
d) Because electrolysis produces greenhouse gases
Answer: a

10. What is the main problem in using hydrogen as fuel for vehicles?
a) Capital intensive
b) Storage
c) Fuel cell technology is not well established
d) Cars will become heavy
Answer: b

11. What is a fuel cell?
a) Converts heat energy to chemical energy
b) Converts heat energy to electrical energy
c) Converts chemical energy to electrical energy
d) Converts kinetic energy to heat energy . **Answer: c**

12. How does hydrogen fuel cell work?
a) Membrane → hydrogen ions → electric current and recombination with oxygen
b) Electric current and recombination with oxygen → hydrogen ions → membrane
c) Hydrogen ions → membrane → electric current and recombination with oxygen
d) Recombination with oxygen → electric current → membrane → hydrogen ions
Answer: d

13. What does hydrogen fuel cell emit?
a) Water
b) Steam
c) Greenhouse gas
d) Methane
Answer: a

14. Fuel cell vehicle is sourced by a battery.
a) True
b) False
Answer: b

15. High pressure containers are used to store hydrogen.
a) True
b) False
Answer: a

16. Which of the following energy has the greatest potential among all the sources of renewableenergy?
a) Solar energy
b) Wind Energy
c) Thermal energy
d) Hydro-electrical energy
Answer: a

17. What is the rate of solar energy reaching the earth surface?a) 1016W
b) 865W
c) 2854W
d) 1912W
Answer: a

18. What is total amount of solar energy received by earth and atmosphere?
a) 3.8 X 1024 J/year
b) 9.2 X 1024 J/year
c) 5.4 X 1024 J/year
d) 2.1 X 1024 J/year
Answer: a

19. Which is most common source of energy from which electricity is produced?
a) Hydroelectricity
b) Wind energy
c) Coal

d) Solar energy
Answer: c

20. Oil is estimated to last for_____more.
a) 100 years
b) 500 years
c) A decade
d) 800 years
Answer: a

21. Complete the following reaction.
$H_2O + CO_2 \rightarrow$ _____
a) $CH_2O + O_2$
b) $CO_2 + O_2$
c) $H + CO_2 + O_2$
d) $CH_2O + H_2O + O_2$
Answer: a

22. In what form is solar energy is radiated from the sun?
a) Ultraviolet Radiation
b) Infrared radiation
c) Electromagnetic waves
d) Transverse waves
Answer: c

23. What does MHD stands for in the energy field?
a) Magneto Hydro Dynamic
b) Metal Hydrogen Detox
c) Micro Hybrid Drive
d) Metering Head Differential
Answer: a

24. Solar radiation which reaches the surface without scattering or absorbed is called _____
a) Beam Radiation
b) Infrared radiation
c) Ultraviolet radiation
d) Diffuse radiation
Answer: a

25. The scattered solar radiation is called _____
a) Direct Radiation
b) Beam Radiation
c) Diffuse radiation
d) Infrared Radiation
Answer: c

26. Solar radiation received at any point of earth is called _____
a) Insolation
b) Beam Radiation
c) Diffuse Radiation
d) Infrared rays
Answer: a

27. Insolation is less _____
a) When the sun is low
b) When the sun right above head
c) At night
d) At sun rise
Answer: a

28. HW stands for _____
a) High and Low water
b) High Level Waste
c) Heated Low Level water
d) High and Low Waste
Answer: b

28. What is unit of nuclear radiation?
a) Reaumur
b) Roentgen
c) Rankine
d) Pascal
Answer: b

29. Which type of fuel is removed from the reactor core after reaching end of core life service?
a) Burnt Fuel
b) Spent fuel
c) Engine oil

d) Radioactive fuel
Answer: b

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

31. OTEC is developed in _____ a) 1880
b) 1926
c) 1890
d) 1930
Answer: a

32. The OTEC is constructed in _____ a) 1920
b) 1924
c) 1922
d) 1926 **Answer: d**

33. The by-product of the ocean thermal energy conversion is _____
a) Hot water
b) Desalinated water
c) Chemicals
d) Gases
Answer: b

34. In ocean thermal energy conversion, the plant pumps the deep cold sea water and do notpump the surface sea water.
a) True
b) False
Answer: b

35. How many types of OTEC plants are there?
a) 1
b) 2
c) 3
d) 4
Answer: c

36. Closed cycle systems use the fluid having _____
a) High boiling points
b) Low boiling points
c) High viscosity

d) Low viscosity
Answer: b

37. Warm surface sea water is pumped through a_____to vaporize the fluid.
a) Heat exchanger
b) Generator
c) Evaporator
d) Condenser
Answer: a

38. The heat exchanger_____the vapour into a liquid which is recycled.
a) Condenses
b) Heats
c) Cools
d) Evaporates **Answer: a**

39. Open cycle OTEC uses_____surface water directly to make electricity.
a) Hot
b) Warm
c) Cool
d) Icy
Answer: b

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

41. The steam leaves the _____
a) Salts
b) Aluminium
c) Copper
d) Silver
Answer: a

42. The open cycle system produces_____water.
a) Desalinated
b) Impure
c) Contaminated
d) Chlorinated
Answer: a

43. In_____method the sea water enters a vacuum chamber and flash evaporated.
a) Closed cycle system

b) Open cycle system
c) Hybrid OTEC
d) Neither closed nor open system

Answer: c

44. How is OTEC caused?
a) By wind energy
b) By geothermal energy
c) By solar energy
d) By gravitational force
Answer: c

45. What does OTEC stand for?
a) Ocean thermal energy cultivation
b) Ocean thermal energy conversion
c) Ocean techno energy conservation
d) Ocean thermal energy consumption
Answer: b

46. Which country has world's largest tidal power plant?
a) Netherlands
b) South Korea
c) Laos
d) Bolivia
Answer: b

47. Which type of turbine is commonly used in tidal energy?
a) Francis turbine
b) Kaplan turbine
c) Pelton wheel
d) Gorlov turbine
Answer: b

48. How is water trapped from coastal waters?
a) By building canals
b) By building dams
c) By digging wells
d) By storing in tanks
Answer: b

49. Water to the turbine is allowed through the _____
a) Pipes
b) Sluice gates
c) Canals

d) Pumps
Answer: b

50. The tides are rhythmic and constant.
a) True
b) False
Answer: b

51. For exactly how much time does it take for one tidal cycle?
a) 22h, 20min
b) 24h, 50min
c) 20h, 10min
d) 22h, 50min
Answer: b

52. What type of tide is it if the difference between high and low tide is greatest?
a) Diurnal tide
b) Neap tide
c) Spring tide
d) Ebb tide
Answer: c

53. A tide whose difference between high and low tides is least is called as _____
a) Diurnal tide
b) Neap tide
c) Spring tide
d) Ebb tide
Answer: b

54. Which of the turbine can be mounted vertically and horizontally?
a) Pelton wheel
b) Kaplan turbine
c) Gorlov turbine
d) Francis turbine
Answer: c

55. What types of tides occur when there is so much interference with continents?
a) Diurnal tide
b) Neap tide
c) Spring tide
d) Ebb tide
Answer: a

56. What does Heating and cooling of the atmosphere generates?
a) Thermo line circulation
b) Radiation currents
c) Convection currents
d) Conduction currents
Answer: c

57. 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
Answer: b

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

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

60. Which country created wind mills?
a) Egypt
b) Mongolia
c) Iran
d) Japan
Answer: c

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

62. 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
Answer: d

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

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

65. What is the diameter of wind turbine blades?
a) 320 feet
b) 220 feet
c) 80 feet
d) 500 feet
Answer: b

66. 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
Answer: d

67. When did the development of wind power in India begin?a) 1965
b) 1954
c) 1990
d) 1985
Answer: c

68. Disasters can be broadly termed as_____types.
a) 2
b) 4
c) 5
d) 3
Answer: a

69. The annual flood peaks in India are recorded in months of:
a) June, July
b) July, August
c) July, September
d) August, September
Answer: d

70. Uttarakhand lies in zone_____of Earthquake prone areas.
a) 5
b) 3
c) 4
d) 2
Answer: c

71. To measure flood variability,_____is used widely.
a) FFMI
b) FI
c) FMI
d) FFI
Answer: a

72. Disaster management deals with situation that occurs after the disaster.
a) True
b) False
Answer: b

73. How many elements of disaster management are there?
a) 8
b) 7
c) 4
d) 6
Answer: d

74. Which of the below is an example of slow-onset disaster?
a) Earthquake
b) Tsunami

c) Cyclone
d) Draught
Answer: d

75. How many phases of disaster response are there?
a) 5
b) 4
c) 3
d) 2
Answer: a

76. The first step in preparedness planning is:
a) Analysis of data collected
b) Determination of objectives
c) Development of implementing device
d) Determination of strategy
Answer: b

77. Tsunami detectors are placed in sea at_____kms from shore.
a) 25
b) 100
c) 50
d) 85
Answer: c

78. Carbon footprint can be measured by:
a) Carbon dating
b) Instruments
c) Carbon accounting
d) Formula

Answer: c
79. A legally binding agreement between 2 or more nation states relating to environment is:
a) BEA
b) BA
c) MA
d) MEA
Answer: d

80. _____ is a programme run by UN related to sustainable development.
a) GHG indicator
b) Agenda 21
c) IPCC
d) UNEP
Answer: b

81. For a gold LEED certification, how many points are required?a) 40-49
b) 60-79
c) 50-59
d) 80-110
Answer: b

82. Which of the below green building in India has received a platinum LEED certification?
a) Dabur India, Chandigarh
b) Logix Cyber Park, UP
c) Unitech Commercial Tower, Chandigarh
d) Suzlon One Earth, Pune
Answer: d

83. _____ is the conventional source for hydel power.
a) Tidal wave
b) Currents
c) Water
d) Ripples
Answer: c

84. The first academic publication about ecological footprints was in:a) 1992
b) 1990
c) 1993
d) 1994
Answer: a

85. Which of the below is a global scale environmental issue?
a) Eutrophication
b) Regional ozone
c) Climate change
d) Pollution
Answer: c

86. Carbon can be stored in organic matter in the form of:
a) Biomass

b) Biofuel
c) Bioenergy
d) Bio carbon

Answer: a

87. The 'Miracle Material' that can turn CO2 into liquid fuel is:
a) Propene
b) moCopper
c) Graphene
d) Potassium
Answer: c

88. Acid rains are produced by

(a) Excess NO2 and SO2 from burning fossil fuels

(b) Excess production of NH3 by industry and coal gas

(c) Excess release of carbon monoxide by incomplete combustion
(d)Excess formation of CO2 by combustion and animal respiration. (1988, 89)

Answer (a)

89. Green house effect is warming due to

(a) Infra-red rays reaching earth

(b) Moisture layer in atmosphere

(c) Increase in temperature due to increase in carbon dioxide concentration of atmosphere

(d) Ozone layer of atmosphere.

Answer (c)