Chapter 1 :Nature of Science of Chemistry

MCQs;

- 1. Chemistry is the study of:
- a) Living organisms
- b) Matter and its changes
- c) Planets and stars
- d) Energy production
- Correct option: b) Matter and its changes

2. Which branch of chemistry deals with carbon compounds?
a) Inorganic chemistry
b) Organic chemistry
c) Analytical chemistry
d) Biochemistry
Correct option: b) Organic chemistry

3. Inorganic chemistry studies:
a) Hydrocarbons
b) Carbon dioxide
c) Minerals and metals
d) Both b and c
Correct option: d) Both b and c

4. Which branch of chemistry focuses on the study of living organisms?

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- a) Physical chemistry
- b) Biochemistry
- c) Organic chemistry
- d) Industrial chemistry

Correct option: b) Biochemistry

5. The branch of chemistry that studies reaction rates is:

- a) Industrial chemistry
- b) Analytical chemistry
- c) Physical chemistry
- d) Environmental chemistry

Correct option: c) Physical chemistry

6. Environmental chemistry focuses on:

a) Nuclear reactions
b) Green chemistry
c) Pollution and its effects
d) Both b and c
Correct option: d) Both b and c

7. Which of the following is an example of chemistry in daily life?
a) Digestion of food
b) Rusting of iron
c) Cooking of food
d) All of these
Correct option: d) All of these

8. Which industry uses chemistry for making medicines?
a) Textile industry
b) Pharmaceutical industry
c) Cement industry
d) Paper industry
Correct option: b) Pharmaceutical industry

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9. Science is the study of:
a) Natural world
b) Superstitions
c) Myths
d) Magic
Correct option: a) Natural world

10. Technology is the:
a) Application of science
b) Study of stars
c) Use of supernatural powers
d) None of these
Correct option: a) Application of science

11. Which of the following is NOT a branch of chemistry?

- a) Biochemistry
- b) Physics
- c) Analytical chemistry
- d) Physical chemistry

Correct option: b) Physics

12. Plastic bags are made from:
a) Wood
b) Petroleum products
c) Rubber
d) Cotton
Correct option: b) Petroleum products

13. Which property makes plastic bags harmful to the environment?
a) Solubility in water
b) Biodegradability
c) Non-biodegradability
d) Soft texture
Correct option: c) Non-biodegradability

14. Which industry relies on analytical chemistry?
a) Oil refining
b) Steel manufacturing
c) Medicine production
d) All of these
Correct option: d) All of these

15. A chemist studying the energy changes in chemical reactions is working in:
a) Physical chemistry
b) Organic chemistry
c) Industrial chemistry
d) Biochemistry

Correct option: a) Physical chemistry

16. Science, technology, and engineering are used together in:

- a) Agriculture
- b) Medicine
- c) Space exploration
- d) All of these

Correct option: d) All of these

17. Which technology is used in food preservation?

a) Refrigeration
b) Boiling
c) Drying
d) All of these
Correct option: d) All of these

18. Plastic bags harm the environment because they:
a) Pollute soil and water
b) Release toxic gases
c) Take centuries to degrade
d) All of these
Correct option: d) All of these

19. Which chemical is commonly used in fertilizers?
a) Sodium chloride
b) Ammonium nitrate
c) Calcium carbonate
d) Silver nitrate
Correct option: b) Ammonium nitrate

20. Which branch of chemistry helps in forensic investigations?
a) Analytical chemistry
b) Industrial chemistry
c) Organic chemistry
d) Physical chemistry
Correct option: a) Analytical chemistry

21. Which of the following is NOT an application of chemistry?
a) Medicine production
b) Electricity generation
c) Iron rusting
d) All are applications
Correct option: d) All are applications

22. Which chemical is used in soap making?

- a) Sodium hydroxide
- b) Potassium chloride
- c) Calcium carbonate
- d) Copper sulfate

Correct option: a) Sodium hydroxide

23. Which is a biodegradable alternative to plastic bags?

a) Nylon bags

b) Paper bags

c) Metal bags

d) Rubber bags

Correct option: b) Paper bags

24. Which type of chemistry helps in designing new materials?

a) Physical chemistry

b) Polymer chemistry

c) Biochemistry

d) Environmental chemistry

Correct option: b) Polymer chemistry

25. Which of the following is an advantage of plastic bags?

a) Cheap and lightweight

b) Easily decomposed

c) Improves soil fertility

d) Non-toxic to wildlife

Correct option: a) Cheap and lightweight

26. Which of the following is an environmental problem caused by plastic waste?
a) Soil pollution
b) Water pollution

c) Ai<mark>r poll</mark>ution d) All of these

Correct option: d) All of these

27. Which of the following is NOT a branch of chemistry?
a) Industrial chemistry
b) Analytical chemistry
c) Earth chemistry
d) Physical chemistry
Correct option: c) Earth chemistry

28. Which chemical is used in water purification?a) Sodium chloride

b) Chlorine
c) Silver nitrate
d) Ammonia
Correct option: b) Chlorine

29. Which of the following is NOT a chemical change?
a) Rusting of iron
b) Boiling of water
c) Burning of wood
d) Digestion of food
Correct option: b) Boiling of water

30. What is the major component of glass?
a) Silica
b) Iron
c) Copper
d) Carbon
Correct option: a) Silica

31. Which chemical process is used in food preservation?
a) Fermentation
b) Neutralization
c) Sublimation
d) Electrolysis
Correct option: a) Fermentation

32. Which of the following is a renewable resource?

a) Petroleum

b) Coal

c) Solar energy

d) Natural gas

Correct option: c) Solar energy

33. Which process is used to separate crude oil into different components?

a) Distillation

b) Filtration

c) Electrolysis

d) Sublimation

Correct option: a) Distillation

34. Which gas is responsible for global warming?
a) Nitrogen
b) Oxygen
c) Carbon dioxide
d) Hydrogen
Correct option: c) Carbon dioxide

- 35. Which chemical is used to disinfect water?
- a) Sodium chloride
- b) Chlorine
- c) Iron oxide
- d) Zinc sulfate

Correct option: b) Chlorine

36. Which branch of chemistry deals with drug manufacturing?

- a) Organic chemistry
- b) Pharmaceutical chemistry
- c) Analytical chemistry
- d) Physical chemistry

Correct option: b) Pharmaceutical chemistry

Chapter 2 :Matter

MCQs;

- 1. Matter is anything that has:
- a) Mass and volume
- b) Only weight
- c) No physical existence
- d) None of these

Correct option: a) Mass and volume

2. Which of the following is NOT a state of matter?

- a) Solid
- b) Liquid
- c) Gas
- d) Vacuum

Correct option: d) Vacuum

3. Which state of matter has a definite shape and volume?
a) Solid
b) Liquid
c) Gas
d) Plasma
Correct option: a) Solid

4. Which state of matter has no fixed shape but a fixed volume?
a) Solid
b) Liquid
c) Gas
d) Plasma
Correct option: b) Liquid

5. Which state of matter expands to fill the entire container?
a) Solid
b) Liquid
c) Gas
d) Bose-Einstein condensate
Correct option: c) Gas

6. Which of the following states of matter has the highest energy?
a) Solid
b) Liquid
c) Gas
d) Plasma
Correct option: d) Plasma

7. Which of the following is an example of a plasma state?
a) Ice
b) Water vapor
c) Lightning
d) Oxygen gas
Correct option: c) Lightning

8. The smallest unit of matter is called a:

- a) Atom
- b) Molecule
- c) Compound

d) Ion Correct option: a) Atom

9. The process of changing a solid directly into gas is called: a) Condensation

b) Evaporation

c) Sublimation

d) Freezing

Correct option: c) Sublimation

10. Which of the following is NOT a pure substance?

a) Water

b) Air

c) Gold

d) Oxygen

Correct option: b) Air

11. Mixtures can be separated by:
a) Chemical methods
b) Physical methods
c) Both a and b
d) Cannot be separated
Correct option: b) Physical methods

12. Which of the following is a homogeneous mixture?

- a) Sand and iron
- b) Salt dissolved in water
- c) Oil and water

d) Fruit salad

Correct option: b) Salt dissolved in water

13. Which of the following is a heterogeneous mixture?a) Airb) Brass

c) Smoke

d) Sugar solution

Correct option: c) Smoke

14. Which of the following is a compound?
a) Oxygen
b) Gold
c) Water
d) Silver
Correct option: c) Water

15. Elements are composed of:
a) Molecules
b) Compounds
c) Atoms
d) Mixtures
Correct option: c) Atoms

16. Which of the following is an extensive property of matter?
a) Density
b) Color
c) Mass
d) Boiling point
Correct option: c) Mass

17. Which of the following is an intensive property?
a) Volume
b) Mass
c) Density
d) Weight
Correct option: c) Density

18. Which method is used to separate salt from seawater?
a) Filtration
b) Distillation
c) Decantation
d) Chromatography
Correct option: b) Distillation

19. Which process is used to separate solids from liquids using filter paper?

a) Filtration

b) Evaporation

c) Crystallization

d) Centrifugation Correct option: a) Filtration

20. Which state of matter has the strongest intermolecular forces?
a) Solid
b) Liquid
c) Gas
d) Plasma
Correct option: a) Solid

21. Which of the following is true for solids?
a) Have a fixed shape and fixed volume
b) Have no fixed shape but a fixed volume
c) Have no fixed shape or volume
d) Can be compressed easily

Correct option: a) Have a fixed shape and fixed volume

22. Which of the following is NOT a characteristic of gases?

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a) No definite shape

b) No definite volume

c) Can be compressed

d) Fixed shape

Correct option: d) Fixed shape

23. Which of the following is an example of sublimation?

a) Ice melting into water

b) Dry ice turning into gas

c) Water evaporating

d) Water freezing

Correct option: b) Dry ice turning into gas

24. Which property of matter is used in making a thermos bottle?

- a) Expansion on heating
- b) Compression on cooling
- c) Solubility in water
- d) High density

Correct option: a) Expansion on heating

25. Which of the following can change the shape of a solid?
a) Heating
b) Freezing
c) Evaporating
d) None of these
Correct option: a) Heating

26. Which of the following is an example of a mixture?
a) Water
b) Air
c) Oxygen
d) Gold
Correct option: b) Air

27. Which of the following is true for liquids?
a) Have a fixed shape and fixed volume
b) Have no fixed shape but fixed volume
c) Have no fixed shape or volume
d) Have a fixed shape and can expand
Correct option: b) Have no fixed shape but fixed volume

28. Which of the following is a chemical change?
a) Melting ice
b) Boiling water
c) Burning of wood
d) Dissolving salt in water
Correct option: c) Burning of wood

29. Which of the following is an example of a physical change?
a) Rusting of iron
b) Burning of paper
c) Melting of ice
d) Cooking food
Correct option: c) Melting of ice

30. The process in which a liquid turns into gas is called:

a) Condensation

b) Freezing

c) Evaporation

d) Sublimation Correct option: c) Evaporation

31. Which of the following is NOT a property of gases?

a) Gases have no definite shape

b) Gases have a definite volume

c) Gases can be compressed

d) Gases expand to fill the container

Correct option: b) Gases have a definite volume

32. What happens to the volume of gas when the pressure is increased at constant temperature?

a) Volume increases

b) Volume decreases

c) Volume remains constant

d) Pressure increases exponentially

Correct option: b) Volume decreases

33. The process of converting a gas directly into a solid is called:

a) Freezing

b) Deposition

c) Sublimation

d) Condensation

Correct option: b) Deposition

34. What is the boiling point of water at sea level?

a) 100°C

b) 0°C

c) 50°C

d) 25°C

Correct option: a) 100°C

35. Which of the following is the best example of a solution?

a) Sand in water

b) Sugar dissolved in water

c) Oil and water

d) Muddy water

Correct option: b) Sugar dissolved in water

36. Which of the following is an example of an element?
a) Water
b) Oxygen
c) Sodium chloride
d) Carbon dioxide

Correct option: b) Oxygen

37. Which of the following is NOT a chemical property of matter?

- a) Reactivity with oxygen
- b) Ability to burn
- c) Density
- d) pH value
- **Correct option: c) Density**

38. The mass of an object is independent of its:

- a) Location on Earth
- b) Temperature
- c) Volume
- d) Shape
- Correct option: a) Location on Earth

39. Which of the following is a property of liquids?
a) Have a definite shape and volume
b) Have no fixed shape but a fixed volume
c) Cannot be poured
d) Cannot be compressed

Correct option: b) Have no fixed shape but a fixed volume

40. Which of the following is used to separate an insoluble solid from a liquid?
a) Distillation
b) Filtration
c) Evaporation
d) Sublimation

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Correct option: b) Filtration

41. What is the chemical formula of methane?a) CH4b) CO2

c) H2O d) 02 **Correct option: a) CH4**

42. Which of the following describes the movement of particles in a gas? a) Fixed and close together b) Moving in straight lines with random motion c) In a fixed position d) Moving in an orderly manner Correct option: b) Moving in straight lines with random motion

43. Which of the following is NOT an example of a homogeneous mixture? a) Salt dissolved in water b) Air c) Oil and water d) Vinegar Correct option: c) Oil and water

44. What happens to the speed of molecules when a substance is heated?

a) Speed increases

c) Speed remains constant

d) Speed stops completely

Correct option: a) Speed increases

45. Which of the following is NOT a property of matter?

a) Color

b) Density

c) Size

d) Weight

Correct option: d) Weight

46. The process of a solid turning into a liquid is called:

a) Freezing

b) Melting

c) Evaporation

d) Condensation

Correct option: b) Melting

47. Which of the following is NOT an example of a physical change?a) Tearing a paperb) Melting icec) Rusting of iron

d) Boiling water

Correct option: c) Rusting of iron

48. Which of the following materials is used in the process of filtration?

- a) Cotton
- b) Sand
- c) Paper

d) Plastic

Correct option: c) Paper

49. Which of the following properties of matter is common to both solids and liquids?

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- a) Definite shape
- b) Definite volume
- c) No definite shape or volume
- d) Can be compressed easily

Correct option: b) Definite volume

50. The process of heating a liquid until it changes into gas is known as:

- a) Freezing
- b) Boiling
- c) Condensation
- d) Evaporation
- **Correct option: b) Boiling**
- 51. Which of the following is an example of deposition?
- a) Snow forming from water vapor
- b) Ice melting into water
- c) Water turning into steam
- d) Water freezing into ice

Correct option: a) Snow forming from water vapor

52. Which of the following best describes a mixture? a) Made up of one type of molecule

b) Can be physically separated into components

c) Has a fixed composition
d) Cannot be separated into individual substances
Correct option: b) Can be physically separated into components

53. Which of the following is a property of gases? a) Gases have a fixed shape

a) Gases have a fixed shape

b) Gases have a definite volume

c) Gases are easily compressed

d) Gases have no weight

Correct option: c) Gases are easily compressed

54. What happens to the volume of a liquid when it is heated?

a) Volume increases

b) Volume decreases

c) Volume remains the same

d) Volume changes irregularly

Correct option: a) Volume increases

55. What is the main difference between a solid and a liquid?

a) Shape

b) Volume

c) Density

d) Temperature

Correct option: a) Shape

56. The boiling point of water decreases as we go higher above sea level due to:

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a) Decrease in air pressure

b) Increase in temperature

c) Inc<mark>rease in air pressure</mark>

d) Decrease in humidity

Correct option: a) Decrease in air pressure

57. Which of the following is an example of a chemical change?

a) Crushing a rock

b) Cutting a paper

c) Cooking an egg

d) Melting butter

Correct option: c) Cooking an egg

58. Which of the following statements is true about a liquid?

- a) Has a definite shape and volume
- b) Has no definite shape but definite volume
- c) Has neither definite shape nor volume
- d) Can be compressed easily

Correct option: b) Has no definite shape but definite volume

59. Which of the following is a method used to separate the components of a solution? a) Sublimation

- b) Chromatography
- c) Distillation
- d) All of these

Correct option: d) All of these

60. Which of the following is true for a mixture of two gases?

- a) The gases do not mix
- b) The gases mix uniformly
- c) The gases always separate into layers
- d) The gases will change chemical properties

Correct option: b) The gases mix uniformly

Chapter 3 : Atomic Structure

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MCQs;

- 1. Who proposed the atomic theory in 1808?
- a) J.J. Thomson
- b) John Dalton
- c) Rutherford
- d) Bohr

Correct option: b) John Dalton

- 2. Which subatomic particle has no charge?
- a) Proton
- b) Electron
- c) Neutron
- d) Nucleus

Correct option: c) Neutron

3. The charge on an electron is:
a) +1
b) -1
c) 0
d) +2
Correct option: b) -1

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4. What is the mass of a proton in atomic mass units (amu)?

a) 0.0005 amu

b) 1 amu

c) 2 amu

d) 0 amu

Correct option: b) 1 amu

5. Which experiment led to the discovery of the nucleus?
a) Cathode ray experiment
b) Gold foil experiment
c) Oil drop experiment
d) Alpha particle scattering experiment
Correct option: b) Gold foil experiment

6. Which subatomic particle orbits around the nucleus?
a) Proton
b) Neutron
c) Electron
d) All of these
Correct option: c) Electron

7. Who discovered the electron?
a) Rutherford
b) Bohr
c) J.J. Thomson
d) Dalton
Correct option: c) J.J. Thomson

8. What is the relative mass of an electron?a) 1 amub) 0.0005 amu

c) 1.67 amu

d) 2 amu Correct option: b) 0.0005 amu

9. The nucleus of an atom contains:
a) Only protons
b) Only neutrons
c) Protons and neutrons
d) Protons and electrons
Correct option: c) Protons and neutrons

10. Which scientist discovered the neutron?
a) J.J. Thomson
b) Rutherford
c) Chadwick
d) Bohr
Correct option: c) Chadwick

11. The atomic number of an element represents the number of:
a) Protons
b) Neutrons
c) Electrons
d) Both protons and electrons

Correct option: a) Protons

12. Which isotope of hydrogen has one neutron?
a) Protium
b) Deuterium
c) Tritium
d) Hydrogen-1
Correct option: b) Deuterium

13. Which of the following is NOT a fundamental particle?

a) Proton

b) Neutron

c) lon

d) Electron

Correct option: c) lon

14. Which subatomic particle determines the chemical properties of an atom?
a) Proton
b) Neutron
c) Electron
d) Nucleus
Correct option: c) Electron

15. The mass number of an atom is equal to:
a) Protons + Neutrons
b) Protons + Electrons
c) Neutrons + Electrons
d) Only Protons
Correct option: a) Protons + Neutrons

16. What is an isotope?
a) Atoms with the same number of protons but different number of neutrons
b) Atoms with the same number of neutrons but different protons
c) Atoms with different electrons
d) Atoms with different chemical properties
Correct option: a) Atoms with the same number of protons but different number of

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neutrons

17. Bohr's atomic model explains:
a) Circular motion of electrons
b) Energy levels
c) Structure of the nucleus
d) None of these
Correct option: b) Energy levels

18. The nucleus of an atom is:
a) Positively charged
b) Negatively charged
c) Neutral
d) Both positive and negative
Correct option: a) Positively charged

19. The atomic number of carbon is 6. How many electrons does it have?

- a) 4
- b) 6
- c) 8

d) 12 Correct option: b) 6

20. Which scientist proposed the planetary model of the atom?
a) Rutherford
b) Bohr
c) Dalton
d) J.J. Thomson

Correct option: b) Bohr

21. Which particle has the least mass?
a) Proton
b) Neutron
c) Electron
d) Atom
Correct option: c) Electron

22. An atom becomes an ion when it:
a) Gains or loses electrons
b) Gains protons
c) Loses neutrons
d) Changes its nucleus
Correct option: a) Gains or loses electrons

23. The relative charge of a neutron is:
a) +1
b) -1
c) 0
d) +2
Correct option: c) 0

24. Who discovered the proton?
a) J.J. Thomson
b) Rutherford
c) Chadwick
d) Bohr
Correct option: b) Rutherford

25. Which subatomic particle determines the identity of an element?

a) Proton
b) Neutron
c) Electron
d) Nucleus
Correct option: a) Proton

26. Which subatomic particle is involved in chemical bonding?
a) Proton
b) Neutron
c) Electron
d) Nucleus

Correct option: c) Electron

27. Rutherford's gold foil experiment showed that:
a) Atoms are indivisible
b) Atoms have a nucleus
c) Electrons revolve around the nucleus
d) Neutrons exist
Correct option: b) Atoms have a nucleus

28. How many energy levels does an atom of sodium (Na) have?
a) 1
b) 2
c) 3
d) 4
Correct option: c) 3

29. What is the charge of an alpha particle?
a) +1
b) +2
c) -1
d) 0
Correct option: b) +2

30. The negatively charged particles in an atom are called:

a) Protons

b) Neutrons

c) Electrons

d) Nucleons

Correct option: c) Electrons

31. An atom of oxygen has 8 protons. Its atomic number is:

a) 4 b) 8 c) 16 d) 32 **Correct option: b) 8**

32. Atoms of the same element with different mass numbers are called: a) Isotopes b) lons c) Isobars d) Molecules **Correct option: a) Isotopes**

33. What is the atomic mass of an element with 10 protons and 12 neutrons? a) 10 b) 12 c) 22 d) 24 OCH BADLO BY MA

Correct option: c) 22

34. Which model introduced the concept of electron energy levels?

- a) Dalton's Model
- b) Rutherford's Model
- c) Bohr's Model
- d) Thomson's Model

Correct option: c) Bohr's Model

35. In a neutral atom, the number of electrons is equal to the number of:

- a) Neutrons
- b) Protons
- c) Isotopes

d) lons

Correct option: b) Protons

36. Which isotope is used in the treatment of cancer?

a) Carbon-12 b) lodine-131 c) Uranium-238 d) Hydrogen-2 **Correct option: b) lodine-131**

37. Which element is used in atomic bombs?
a) Carbon
b) Hydrogen
c) Uranium
d) Oxygen
Correct option: c) Uranium

38. Electrons are found in:
a) Nucleus
b) Orbits
c) Neutrons
d) Protons
Correct option: b) Orbits

39. The number of neutrons in an atom is found by:
a) Atomic number + Mass number
b) Atomic number - Mass number
c) Mass number - Atomic number
d) None of these
Correct option: c) Mass number - Atomic number

40. Which of the following is a radioactive isotope?
a) Carbon-12
b) Carbon-14
c) Oxygen-16
d) Hydrogen-1
Correct option: b) Carbon-14

41. Who proposed the concept of the indivisible atom?

- a) Dalton
- b) Bohr
- c) Rutherford
- d) J.J. Thomson

Correct option: a) Dalton

42. Electrons move around the nucleus in fixed paths according to:
a) Dalton's theory
b) Rutherford's model
c) Bohr's model
d) Quantum mechanics

Correct option: c) Bohr's model

43. Which of the following isotopes is used in carbon dating?

a) Carbon-12

b) Carbon-14

c) Carbon-16

d) Carbon-18

Correct option: b) Carbon-14

44. The nucleus of an atom contains nearly all of its:

a) Charge

b) Mass

c) El<mark>ectron</mark>s

d) Volume

Correct option: b) Mass

45. Which subatomic particle has the highest mass?

a) Electron

b) Proton

- c) Neutron
- d) Both b and c

Correct option: d) Both b and c

46. What happens when an atom loses an electron?

- a) Becomes neutral
- b) Becomes positively charged
- c) Becomes negatively charged
- d) Becomes unstable

Correct option: b) Becomes positively charged

47. Atoms with the same atomic number but different mass numbers are called:

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a) Isotopes
b) Isobars
c) Ions
d) Molecules
Correct option: a) Isotopes

48. An isotope of uranium used for nuclear energy is:
a) U-235
b) U-238
c) U-239
d) U-240
Correct option: a) U-235

49. Which element has an atomic number of 1?
a) Oxygen
b) Hydrogen
c) Helium
d) Carbon
Correct option: b) Hydrogen

50. An atom with 15 protons and 16 neutrons has a mass number of: a) 15 b) 16 c) 31 d) 32 Correct option: c) 31

51. How many electrons does sodium have in its outermost shell?
a) 1
b) 2
c) 3
d) 8
Correct option: a) 1

52. What is the main difference between isotopes?

- a) Number of protons
- b) Number of neutrons
- c) Number of electrons
- d) Number of bonds

Correct option: b) Number of neutrons

53. The charge on a proton is: a) -1 b) +1 c) 0 d) +2 Correct option: b) +1

54. In which part of an atom is the mass mostly concentrated?

a) Electron cloud

b) Protons only

c) Neutrons only

d) Nucleus

Correct option: d) Nucleus

55. Which fundamental force holds the nucleus together?

a) Electromagnetic force

b) Gravitational force

c) Strong nuclear force

d) Weak nuclear force

Correct option: c) Strong nuclear force

Chapter 4: Periodic Table and Periodicity Of Properties

MCQs;

1. The modern periodic table is arranged according to:

a) Increasing atomic mass

b) Increasing atomic number

c) Chemical reactivity

d) Number of neutrons

Correct option: b) Increasing atomic number

2. Modern periodic law states that properties of elements are periodic functions of their:

a) Atomic mass

b) Atomic number

c) Valency

d) Density

Correct option: b) Atomic number

3. Which scientist proposed the modern periodic law?

a) Dobereiner

b) Newlands
c) Moseley
d) Mendeleev
Correct option: c) Moseley

4. How many periods are in the modern periodic table?
a) 6
b) 7
c) 8
d) 9
Correct option: b) 7

5. The horizontal rows in the periodic table are called:

a) Groups

b) Families

c) Periods

d) Blocks

Correct option: c) Periods

6. How many groups are present in the periodic table?

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a) 7

b) 8

c) 16

d) 18

Correct option: d) 18

7. Which group contains noble gases?

- a) Group 1
- b) Group 2

c) Group 17

d) Group 18

Correct option: d) Group 18

8. Elements in the same group have the same:

a) Number of valence electrons

b) Atomic number

c) Mass number

d) Number of protons

Correct option: a) Number of valence electrons

9. What is the valency of an element with an atomic number of 17?

a) 1

b) 2

c) 7

d) 8 Correct option: a) 1

10. The most reactive metal in Group 1 is:

a) Sodium

b) Lithium

c) Cesium

d) Potassium

Correct option: c) Cesium

11. Elements of Group 17 are called:
a) Noble gases
b) Alkali metals
c) Halogens
d) Alkaline earth metals
Correct option: c) Halogens

12. What is the general trend of atomic radius across a period? a) Increases

b) Decreases

c) Remains constant

d) First increases, then decreases

Correct option: b) Decreases

13. Why does atomic radius decrease across a period?

a) Increased nuclear charge

b) Addition of electrons

c) Increased shielding effect

d) Decreased number of protons

Correct option: a) Increased nuclear charge

14. Which property increases down a group?
a) Ionization energy
b) Atomic size
c) Electronegativity
d) Electron affinity

Correct option: b) Atomic size

15. Which element has the highest ionization energy?

a) Hydrogen

b) Helium

c) Oxygen

d) Fluorine

Correct option: b) Helium

16. Which of the following is an alkaline earth metal?
a) Sodium
b) Magnesium
c) Iron
d) Fluorine
Correct option: b) Magnesium

17. Electronegativity is highest in:
a) Group 1
b) Group 2
c) Group 17
d) Group 18
Correct option: c) Group 17

18. The element with atomic number 1 is placed in:
a) Group 1
b) Group 2
c) Group 17
d) Group 18
Correct option: a) Group 1

19. The elements of Group 1 are known as:
a) Noble gases
b) Transition metals
c) Alkali metals
d) Halogens
Correct option: c) Alkali metals

20. Which period contains the maximum number of elements?
a) 2nd
b) 3rd
c) 4th
d) 6th
Correct option: d) 6th

21. Which group contains the most reactive nonmetals?
a) Group 1
b) Group 2
c) Group 17
d) Group 18
Correct option: c) Group 17

22. The number of valence electrons in noble gases (except helium) is:

a) 2 b) 6 c) 8

d) 10

Correct option: c) 8

23. Elements in the same period have the same:
a) Number of valence electrons
b) Number of energy shells
c) Atomic number
d) Chemical properties
Correct option: b) Number of energy shells

24. The most metallic element in Group 1 is:

a) Lithium

b) Sodium

c) Potassium

d) Francium

Correct option: d) Francium

25. Elements that form colored compounds are usually:

CH BADLO BY L

- a) Alkali metals
- b) Halogens
- c) Noble gases
- d) Transition metals

Correct option: d) Transition metals

26. Which of the following is a metalloid?

a) Sulfur

- b) Silicon
- c) Potassium
- d) Magnesium

Correct option: b) Silicon

27. The ability of an atom to attract electrons is called:

- a) Ionization energy
- b) Electronegativity
- c) Atomic radius

d) Electron affinity

Correct option: b) Electronegativity

28. The least reactive elements are found in:a) Group 1b) Group 2

c) Group 17d) Group 18Correct option: d) Group 18

29. What happens to metallic character down a group?

a) Increases

b) Decreases

c) Remains constant

d) First increases, then decreases

Correct option: a) Increases

30. Ionization energy is the energy required to:

a) Gain an electron

b) Remove an electron

c) Share an electron

d) Convert into an ion

Correct option: b) Remove an electron

31. The number of valence electrons in oxygen is:

a) 4

b) 6

c) 8

d) 10

Correct option: b) 6

32. The most electronegative element is:
a) Oxygen
b) Fluorine
c) Neon
d) Chlorine
Correct option: b) Fluorine

33. The general trend of ionization energy across a period is:

CH BADLO BY

a) Increases

b) Decreases

c) Remains constant

d) Increases and then decreases

Correct option: a) Increases

34. Elements in the d-block are known as:

a) Noble gases

b) Transition metals

- c) Halogens
- d) Metalloids

Correct option: b) Transition metals

35. Nonmetals generally form: a) Cations

b) Anions

c) Positive ions

d) Metallic bonds

Correct option: b) Anions

36. The chemical reactivity of alkali metals:

a) Increases down the group

b) Decreases down the group

c) Remains constant

d) First increases, then decreases

Correct option: a) Increases down the group

37. How many valence electrons does sodium have?

a) 1

b) 2

c) 3

d) 4

Correct option: a) 1

38. The elements in Group 2 are known as:
a) Halogens
b) Alkali metals
c) Noble gases
d) Alkaline earth metals
Correct option: d) Alkaline earth metals

39. What happens to electron affinity across a period?

a) Increases

b) Decreases

c) Remains the same

d) First increases, then decreases

Correct option: a) Increases

40. The number of valence electrons in chlorine is:

a) 5 b) 6 c) 7 d) 8 Correct option: c) 7 41. Why does atomic size increase down a group?a) Increase in nuclear chargeb) Addition of energy shellsc) Decrease in protonsd) Increased electronegativity

Correct option: b) Addition of energy shells

42. What is the valency of magnesium?

a) 1 b) 2 c) 3 d) 4 Correct option: b) 2

43. The noble gas that does not have 8 valence electrons is:
a) Neon
b) Helium
c) Argon
d) Krypton
Correct option: b) Helium

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44. The elements of Group 17 exist as:

- a) Metals
- b) Nonmetals
- c) M<mark>etalloi</mark>ds

d) Tr<mark>ansiti</mark>on elements

Correct option: b) Nonmetals

45. The tendency of an atom to lose electrons is called:

- a) Electronegativity
- b) Metallic character
- c) lonization energy
- d) Electron affinity

Correct option: b) Metallic character

46. Which group contains the most reactive metals?
a) Group 1
b) Group 2
c) Group 17
d) Group 18

Correct option: a) Group 1

47. Which property decreases down a group?

a) Atomic size
b) Ionization energy
c) Metallic character
d) Reactivity of alkali metals
Correct option: b) Ionization energy

48. The most abundant element in the Earth's crust is:
a) Oxygen
b) Silicon
c) Hydrogen

d) Iron Correct option: a) Oxygen

49. The least reactive nonmetal is:
a) Fluorine
b) Oxygen
c) Neon
d) Bromine
Correct option: c) Neon

50. The number of valence electrons in nitrogen is: a) 3 b) 4 c) 5 d) 6 Correct option: c) 5

51. Which of the following is a transition metal?

a) Sodium

b) Copper

c) Sulfur

d) Argon

Correct option: b) Copper

52. What happens to electronegativity as you move down a group?

a) Increases

b) Decreases

c) Remains constant

d) First increases, then decreases

Correct option: b) Decreases

53. Which of the following is a characteristic of nonmetals?

a) High melting points

b) Good conductors of electricity
c) Brittle solids
d) Malleable and ductile
Correct option: c) Brittle solids

54. The element with atomic number 20 is:
a) Sodium
b) Calcium
c) Magnesium
d) Potassium
Correct option: b) Calcium

55. Which of the following is NOT a periodic property?

a) lonization energy

b) Atomic radius

c) Density

d) Boiling point

Correct option: c) Density

56. Why do noble gases have low reactivity?

a) They have low ionization energy

- b) They have full valence shells
- c) They form strong bonds easily
- d) They have high electronegativity

Correct option: b) They have full valence shells

57. The shielding effect increases when:

a) More energy levels are added

b) Atomic number decreases

c) lonization energy increases

d) Electrons are removed

Correct option: a) More energy levels are added

- 58. Which of the following is a lanthanide element?
- a) Uranium
- b) Cesium

c) Neodymium

d) Lead

Correct option: c) Neodymium

59. The atomic number of an element is determined by the number of:

- a) Neutrons
- b) Electrons
- c) Protons
- d) Isotopes

Correct option: c) Protons

60. Which of the following statements is correct?

- a) Nonmetals form positive ions
- b) Metals have high ionization energy
- c) Noble gases have variable valencies
- d) Metalloids have properties of both metals and nonmetals

Correct option: d) Metalloids have properties of both metals and nonmetals

Chapter 5: Chemical Bonding

MCQs:

1. Which of the following obeys the octet rule?

A) H_2

B) NaCl

C) He

D) BeCl₂

Answer: B) NaCl

2. The tendency of atoms to attain a noble gas configuration is called:

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A) Hund's Rule

B) Aufbau Principle

C) Octet Rule

D) Kinetic Theory

Answer: C) Octet Rule

3. The formation of NaCl involves the transfer of:

A) One electron from Na to Cl

- B) Two electrons from Na to Cl
- C) One electron from CI to Na
- D) No electron transfer

Answer: A) One electron from Na to Cl

4. Covalent bonding generally occurs between:

- A) Metal and Metal
- **B) Metal and Non-metal**
- C) Non-metal and Non-metal

D) Noble gases

Answer: C) Non-metal and Non-metal

5. lonic bonds are formed due to:
A) Sharing of electrons
B) Transfer of electrons
C) Sharing of neutrons
D) None of these
Answer: B) Transfer of electrons

6. The bond present in CO₂ is:
A) lonic bond
B) Covalent bond
C) Metallic bond
D) Coordinate bond
Answer: B) Covalent bond

7. What is the valency of nitrogen?
A) 1
B) 2
C) 3
D) 4
Answer: C) 3

8. The electronic configuration of Magnesium (Mg) is:
A) 1s² 2s² 2p⁶ 3s²
B) 1s² 2s² 2p⁶ 3s¹
C) 1s² 2s² 2p⁶
D) 1s² 2s² 2p⁶ 3s² 3p¹
Answer: A) 1s² 2s² 2p⁶ 3s²

9. The number of valence electrons in oxygen is:
A) 4
B) 6
C) 8
D) 2
Answer: B) 6

10. The shape of methane (CH₄) is:A) LinearB) Trigonal planarC) Tetrahedral

D) Bent Answer: C) Tetrahedral

11. Water (H₂O) has a bent shape due to:
A) Lone pair repulsion
B) Triple bonds
C) lonic nature
D) Metallic bonds
Answer: A) Lone pair repulsion

12. Which of the following molecules has a trigonal planar shape?
A) NH₃
B) CO₂
C) BF₃
D) H₂O
Answer: C) BF₃

13. Which of the following is a polar molecule?
A) CO₂
B) CH₄
C) NH₃
D) Cl₂
Answer: C) NH₃

14. Dipole-dipole forces exist in:
A) Nonpolar molecules
B) Polar molecules
C) Ionic compounds
D) Noble gases
Answer: B) Polar molecules

15. A molecule with equal sharing of electrons is called:
A) lonic
B) Polar covalent
C) Nonpolar covalent
D) Metallic
Answer: C) Nonpolar covalent

16. The stronger the intermolecular forces, the:
A) Lower the boiling point
B) Higher the boiling point
C) More volatile the substance
D) Less soluble in water
Answer: B) Higher the boiling point

17. Which of the following bonds has the highest energy?
A) Single bond
B) Double bond
C) Triple bond
D) Hydrogen bond
Answer: C) Triple bond

18. Hydrogen bonding occurs in: A) NH_3 B) H_2O C) HF D) All of these Answer: D) All of these

19. The bond in NaCl is:
A) Covalent
B) Ionic
C) Metallic
D) Dipole-dipole
Answer: B) Ionic

20. Which of the following is a metallic bond characteristic?
A) Conductivity
B) Brittleness
C) Solubility in water
D) Weak bonding
Answer: A) Conductivity

21. Which of the following metals has the highest metallic character?

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- A) Na
- B) Al
- C) K

D) Mg Answer: C) K

22. The number of hydrogen bonds in water molecules is:
A) 1
B) 2
C) 3
D) 4
Answer: D) 4

23. Which of the following has a coordinate covalent bond?
A) NH₃
B) H₂O
C) NH₄⁺
D) CO₂
Answer: C) NH₄⁺

24. A coordinate bond is formed when:
A) Both atoms share one electron each
B) Both electrons come from the same atom
C) Electrons are transferred
D) None of these
Answer: B) Both electrons come from the same atom

25. The element with the highest electronegativity is:

A) Fluorine

B) Oxygen

C) Chlorine

D) Nitrogen

Answer: A) Fluorine

26. Which of the following elements forms the most stable cation? A) Na B) Cl C) O D) N Answer: A) Na 27. Noble gases do not react because they have:
A) Low ionization energy
B) Full outer shell
C) High electronegativity
D) High atomic mass
Answer: B) Full outer shell

28. The ability of an atom to attract electrons is called:
A) Ionization energy
B) Electron affinity
C) Electronegativity
D) Atomic radius
Answer: C) Electronegativity

29. Which of the following is the hardest substance?
A) Graphite
B) Diamond
C) Buckminsterfullerene
D) Quartz
Answer: B) Diamond

30. Graphite is a good conductor of electricity because:
A) It has free ions
B) It contains delocalized electrons
C) It forms strong ionic bonds
D) It has a low melting point
Answer: B) It contains delocalized electrons

31. The ion formed when magnesium loses two electrons is:

- A) Mg⁺
- B) Mg²⁺
- C) Mg³⁺
- D) Mg⁻

Answer: B) Mg²⁺

32. A molecule of oxygen (O₂) is held together by a:

- A) Single bond
- B) Double bond
- C) Triple bond
- D) Ionic bond

Answer: B) Double bond

33. The strongest type of intermolecular force is:
A) London dispersion
B) Dipole-dipole
C) Hydrogen bonding
D) Van der Waals forces
Answer: C) Hydrogen bonding

34. The noble gas with the highest atomic number is:
A) Neon
B) Argon
C) Krypton
D) Radon
Answer: D) Radon

35. Which of the following compounds contains an ionic bond?
A) CH₄
B) NH₃
C) NaBr
D) CO₂
Answer: C) NaBr

36. The most electronegative element among the following is:

- A) Oxygen
- B) Chlorine
- C) Nitrogen
- D) Sulfur

Answer: A) Oxygen

37. The ability of an atom to lose electrons easily is called:

- A) Electronegativity
- B) Ionization energy
- **C)** Metallic character
- **D)** Electron affinity

Answer: C) Metallic character

38. Which of the following molecules is nonpolar?

A) NH₃ B) H₂O C) CO₂ D) HF Answer: C) CO₂

39. Which element has a full valence shell?
A) Hydrogen
B) Oxygen
C) Neon
D) Sodium
Answer: C) Neon

40. The number of valence electrons in chlorine is: A) 5 B) 6 C) 7 D) 8 Answer: C) 7

41. The correct formula of calcium chloride is:
A) CaCl
B) CaCl₂
C) Ca₂Cl
D) Ca₂Cl₂
Answer: B) CaCl₂

42. The bond angle in methane (CH₄) is approximately:
A) 90°
B) 109.5°
C) 120°
D) 180°
Answer: B) 109.5°

43. Which element is most likely to form a covalent bond?

A) Na

- B) Ca
- C) CI
- D) K

Answer: C) Cl

44. A molecule of nitrogen gas (N₂) contains a:
A) Single bond
B) Double bond
C) Triple bond
D) lonic bond
Answer: C) Triple bond

45. The weakest intermolecular force is:
A) Dipole-dipole
B) London dispersion
C) Hydrogen bonding
D) Covalent bonding
Answer: B) London dispersion

46. Which of the following is an example of a coordinate covalent bond?
A) NH₄⁺
B) O₂
C) NaCl
D) CO₂
Answer: A) NH₄⁺

47. Which of the following metals is the least reactive?
A) Sodium
B) Potassium
C) Copper
D) Magnesium
Answer: C) Copper

48. The charge on a sulfate ion (SO₄) is: A) -1 B) -2 C) +1 D) +2 Answer: B) -2

49. The element with the lowest electronegativity is:

A) Fluorine
B) Oxygen
C) Cesium
D) Nitrogen
Answer: C) Cesium

50. What is the common characteristic of noble gases?
A) Highly reactive
B) Full outer electron shell
C) Forming many compounds
D) High electronegativity
Answer: B) Full outer electron shell

51. The molecular formula of ammonia is: A) NH₄ B) NH₃ C) NO₃ D) NH₂ Answer: B) NH₃

52. Which bond is the most stable?
A) Single bond
B) Double bond
C) Triple bond
D) lonic bond
Answer: C) Triple bond

53. A compound that has both ionic and covalent bonds is:
A) NaCl
B) H₂O
C) CaCO₃
D) CH₄
Answer: C) CaCO₃

54. What type of bonding exists in metallic solids?

- A) Ionic bonding
- **B)** Covalent bonding
- C) Metallic bonding
- D) Hydrogen bonding

Answer: C) Metallic bonding

Chapter 6: Stoichiometry

MCQs;

Which of the following is a diatomic molecule?
 a) O₂
 b) CO₂
 c) H₂O
 d) NH₃
 Correct option: a) O₂

2. The atomic number of carbon is:
a) 6
b) 12
c) 16
d) 18
Correct option: a) 6

3. The sum of protons and neutrons in an atom is called:
a) Atomic number
b) Mass number
c) Atomic mass
d) Isotopic mass
Correct option: b) Mass number

4. Which of the following represents Avogadro's number?
a) 6.022 × 10²³
b) 3.01 × 10²³
c) 1.67 × 10⁻²⁷
d) 22.4 L
Correct option: a) 6.022 × 10²³

5. The molar mass of water (H₂O) is:
a) 18 g/mol
b) 16 g/mol
c) 14 g/mol
d) 20 g/mol
Correct option: a) 18 g/mol

6. The simplest ratio of elements in a compound is given by its:

- a) Molecular formula
- b) Empirical formula
- c) Structural formula
- d) Chemical formula

Correct option: b) Empirical formula

7. The molecular mass of NaCl is:
a) 58.5 g/mol
b) 44 g/mol
c) 98 g/mol
d) 106 g/mol
Correct option: a) 58.5 g/mol

8. The number of atoms in one mole of a substance is:
a) 6.022 × 10²³
b) 3.011 × 10²³
c) 12.044 × 10²³
d) 1.204 × 10²⁴
Correct option: a) 6.022 × 10²³

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9. What is the formula of calcium carbonate?
a) CaCO₃
b) CaCl₂
c) CaOH
d) CaHCO₃
Correct option: a) CaCO₃

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10. The charge on a proton is:
a) +1
b) -1
c) 0
d) +2
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Correct option: a) +1

11. The molar mass of CO₂ is:
a) 44 g/mol
b) 32 g/mol

c) 18 g/mol d) 58 g/mol Correct option: a) 44 g/mol

12. What is the atomic mass of oxygen?
a) 8
b) 16
c) 12
d) 14
Correct option: b) 16

13. The chemical formula of methane is:
a) CH₄
b) C₂H₆
c) CH₃OH
d) C₃H₈
Correct option: a) CH₄

14. The simplest form of matter that cannot be broken down further is called:
a) Element
b) Compound
c) Mixture
d) Molecule

Correct option: a) Element

15. The atomic number of hydrogen is:
a) 1
b) 2
c) 3
d) 4
Correct option: a) 1

16. What is the molecular formula of ammonia?
a) NH₃
b) NH₂
c) N₂H₄
d) NH₄⁺
Correct option: a) NH₃

17. Which gas is used in balloons?
a) Helium
b) Oxygen
c) Hydrogen
d) Carbon dioxide
Correct option: a) Helium

18. Which element is a noble gas?
a) Oxygen
b) Nitrogen
c) Neon
d) Hydrogen
Correct option: c) Neon

19. The chemical formula of hydrochloric acid is:
a) HCI
b) HNO₃
c) H₂SO₄
d) H₂CO₃
Correct option: a) HCI

20. How many atoms are present in one molecule of H₂SO₄?
a) 5
b) 6
c) 7
d) 8
Correct option: d) 8

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21. What is the molar volume of a gas at STP? a) 22.4 L b) 18.0 L c) 6.022 L d) 32.0 L Correct option: a) 22.4 L

22. The empirical formula of hydrogen peroxide (H_2O_2) is: a) HO b) H_2O c) H₄O₂ d) H₂O₂ Correct option: a) HO

23. How many hydrogen atoms are in CH₄?
a) 1
b) 2
c) 3
d) 4
Correct option: d) 4

24. The atomic number of chlorine is:
a) 17
b) 18
c) 19
d) 20
Correct option: a) 17

25. The formula for calcium hydroxide is:
a) CaOH
b) Ca(OH)₂
c) CaH₂O₂
d) Ca₂OH
Correct option: b) Ca(OH)₂

26. What is the molecular formula of butane?
a) C₂H₄
b) C₃H₆
c) C₄H₁₀
d) CH₄
Correct option: c) C₄H₁₀

27. Which element is found in all organic compounds?
a) Hydrogen
b) Oxygen
c) Carbon
d) Nitrogen
Correct option: c) Carbon

28. How many moles of CO₂ are in 88 g of CO₂?
a) 1
b) 2
c) 3
d) 4
Correct option: b) 2

29. What is the charge of a chloride ion (Cl⁻)?
a) +1
b) -1
c) +2
d) -2
Correct option: b) -1

30. The simplest whole-number ratio of elements in a compound is its:
a) Empirical formula
b) Molecular formula
c) Structural formula
d) Chemical equation
Correct option: a) Empirical formula

31. The molecular mass of H₂SO₄ is:
a) 98 g/mol
b) 80 g/mol
c) 65 g/mol
d) 120 g/mol
Correct option: a) 98 g/mol

32. The atomic mass of sodium (Na) is:
a) 11
b) 23
c) 35.5
d) 40
Correct option: b) 23

33. How many atoms of hydrogen are in one molecule of C_2H_6 ?

- a) 2
- b) 4
- c) 6

d) 8 Correct option: c) 6

34. The charge on a neutron is:
a) 0
b) +1
c) -1
d) +2
Correct option: a) 0

35. The molecular formula of glucose is: a) $C_6H_{12}O_6$ b) $C_6H_{10}O_5$ c) $C_6H_{14}O_6$ d) $C_6H_6O_6$ Correct option: a) $C_6H_{12}O_6$

36. Which of the following elements is a halogen?
a) Oxygen
b) Sodium
c) Fluorine
d) Magnesium
Correct option: c) Fluorine

37. The number of valence electrons in nitrogen is:
a) 3
b) 5
c) 7
d) 8
Correct option: b) 5

38. The empirical formula of benzene (C₆H₆) is:
a) CH
b) C₂H₂
c) C₆H₆
d) C₃H₃
Correct option: a) CH

39. What is the mass of 2 moles of oxygen gas (O₂)?
a) 16 g
b) 32 g
c) 64 g
d) 48 g
Correct option: c) 64 g

40. Which state of matter has no definite shape but a definite volume?
a) Solid
b) Liquid
c) Gas
d) Plasma
Correct option: b) Liquid

41. What is the oxidation state of hydrogen in H₂O?
a) 0
b) +1
c) -1
d) +2
Correct option: b) +1

42. The chemical symbol for potassium is: a) P b) Pt c) K d) Po Correct option: c) K

43. How many moles are present in 36 g of water (H₂O)?
a) 1
b) 2
c) 3
d) 4
Correct option: b) 2

44. Which law states that matter cannot be created or destroyed in a chemical reaction? a) Law of Definite Proportions

- b) Law of Conservation of Mass
- c) Law of Multiple Proportions

d) Law of Constant Composition Correct option: b) Law of Conservation of Mass

45. The formula for ammonium ion is:
a) NH₃
b) NH₄⁺
c) NO₃⁻
d) NH₂⁻
Correct option: b) NH₄⁺

46. The number of significant figures in 0.00450 is:
a) 2
b) 3
c) 4
d) 5
Correct option: b) 3

47. Which of the following is a homogeneous mixture?
a) Oil and water
b) Sand and salt
c) Saltwater
d) Iron filings in water
Correct option: c) Saltwater

48. What is the number of moles in 90 g of water (H₂O)?
a) 2
b) 3
c) 5
d) 4
Correct option: b) 5

49. Which of the following is a non-metal?
a) Sodium
b) Calcium
c) Chlorine
d) Iron
Correct option: c) Chlorine

50. Which type of bond is present in H₂O?
a) lonic
b) Covalent
c) Metallic
d) Hydrogen
Correct option: b) Covalent

51. The number of moles in 88 g of CO₂ is: a) 1 b) 2 c) 3 d) 4 Correct option: b) 2

52. Which gas is used in fire extinguishers?
a) Oxygen
b) Carbon dioxide
c) Hydrogen
d) Helium
Correct option: b) Carbon dioxide

53. The valency of oxygen is: a) 1 b) 2 c) 3 d) 4 Correct option: b) 2

54. The pH of pure water is: a) 5 b) 6 c) 7 d) 8 Correct option: c) 7

55. Which of the following elements has the highest electronegativity?

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a) Fluorine

b) Oxygen

c) Nitrogen

d) Chlorine Correct option: a) Fluorine

56. What is the chemical formula for baking soda?
a) NaCl
b) NaHCO₃
c) K₂CO₃
d) CaCO₃
Correct option: b) NaHCO₃

57. The lightest element in the periodic table is:
a) Helium
b) Lithium
c) Hydrogen
d) Oxygen
Correct option: c) Hydrogen

58. Which of the following is an example of an alkali metal?
a) Magnesium
b) Lithium
c) Aluminum
d) Carbon
Correct option: b) Lithium

59. The sum of all oxidation states in a neutral compound is:
a) 0
b) 1
c) -1
d) +2
Correct option: a) 0

60. The scientist who proposed the modern atomic theory was:
a) J.J. Thomson
b) John Dalton
c) Ernest Rutherford
d) Niels Bohr
Correct option: b) John Dalton

Chapter 7:Electrochemistry

MCQs;

1. Which of the following is a product of oxidation?

- a) Oxygen
- b) Hydrogen
- c) Water
- d) Heat
- **Correct option: c) Water**

2.In which part of an electrolytic cell does reduction occur?

- a) Anode
- b) Cathode
- c) Electrolyte
- d) External circuit

Correct option: b) Cathode

3.What is the oxidation state of hydrogen in HCI?

- a) 0
- b) +1
- c) -1
- d) +2

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Correct option: b) +1 C C C C A C L O B Y M A X
```

4.Which metal is commonly used in electroplating to prevent corrosion?

- a) Iron
- b) Gold
- c) Zinc
- d) Copper
- **Correct option: c) Zinc**

5.What is the oxidation state of manganese in KMnO₄?

- a) +2
- b) +4
- c) +7
- d) +6

Correct option: c) +7

6.Which process involves the loss of electrons?

- a) Reduction
- b) Oxidation
- c) Neutralization
- d) Hydrolysis

Correct option: b) Oxidation

7.In a redox reaction, what happens to the reducing agent?

- a) It gains electrons
- b) It loses electrons

c) It remains unchanged

d) It is oxidized

Correct option: b) It loses electrons

8.Which of the following is not an oxidizing agent?

- a) O_2
- b) Cl₂
- c) H_2
- d) KMnO₄

Correct option: c) H₂

9.What happens to silver chloride when exposed to light?

- a) It dissolves
- b) It tarnishes
- c) It turns black
- d) It evaporates
- **Correct** option: c) It turns black

10.The overall reaction in an electrolytic cell is:

- a) Spontaneous
- b) Non-spontaneous
- c) Exothermic
- d) Endothermic

Correct option: b) Non-spontaneous

11.Which of the following is a common example of a reducing agent?

- a) Ozone
- b) Hydrogen peroxide
- c) Sodium

d) Potassium permanganate

Correct option: c) Sodium

12.What is the oxidation state of sulfur in H₂SO₄?

- a) -2 b) +4
- c) +6
- d) 0
- u) U

Correct option: c) +6

```
13.In the reaction Zn + CuSO_4 \rightarrow ZnSO_4 + Cu, which element is oxidized?
  a) Zn
  b) Cu
  c) SO₄
  d) None of the above
  Correct option: a) Zn
14.The process of rusting is an example of:
  a) Electrolysis
  b) Oxidation
  c) Reduction
  d) Sublimation
  Correct option: b) Oxidation
15.Which of the following is used as a cathode in electroplating?
```

- a) Anode
- b) Metal to be plated
- c) Electrolyte
- d) Power source

Correct option: b) Metal to be plated

16.In the reaction $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$, what is the reducing agent?

SOCH BADLO BY MAN

- a) CO
- b) Fe
- c) O_2
- d) CO_2
- **Correct option: a) CO**

17.Which of the following is not a condition for electroplating?

- a) High temperature
- b) High concentration of metal
- c) Low current
- d) High voltage

Correct option: d) High voltage

18.What is the main purpose of cathodic protection?

- a) To enhance conductivity
- b) To prevent corrosion
- c) To increase oxidation
- d) To facilitate electrolysis

Correct option: b) To prevent corrosion

19. Which element has an oxidation state of zero in its elemental form? a) Na

b) Cl
c) O₂
d) Mg
Correct option: c) O₂

20.The term "electrolyte" refers to:

a) A solid conductor

b) A liquid or gel that conducts electricity

c) A source of voltage

d) A type of battery

Correct option: b) A liquid or gel that conducts electricity

21.Which of the following compounds has sulfur in the -2 oxidation state?

a) SO_2

b) H₂S

c) H_2SO_4

d) SCI₂

Correct option: b) H₂S

22.During electrolysis, the substance that is oxidized:

a) Gains electrons

b) Loses electrons

c) Remains unchanged

d) Is reduced

Correct option: b) Loses electrons

23.The process of using electricity to drive a non-spontaneous chemical reaction is known as:

A DA O BY MA

a) Combustion

- b) Electrolysis
- c) Filtration
- d) **Distillation**

Correct option: b) Electrolysis

24.In the reaction $2AgBr \rightarrow 2Ag + Br_2$, what happens to AgBr?

a) It is oxidized

b) It is reduced

c) It remains unchanged

d) It decomposes

Correct option: a) It is oxidized

25. Which of the following metal ions can be reduced to solid metal at the cathode?

a) Na⁺

b) Cu²⁺

c) Al³⁺ d) K⁺ Correct option: b) Cu²⁺

26. The presence of which gas indicates a reducing environment?

a) Oxygen

b) Carbon dioxide

c) Hydrogen

d) Nitrogen

Correct option: c) Hydrogen

27. Which of the following is a characteristic of a strong oxidizing agent?

a) It gains electrons easily

b) It loses electrons easily

c) It is always a gas

d) It is non-metallic

Correct option: a) It gains electrons easily

28. The reaction of an acid with a metal produces:

- a) Salt and water
- b) Hydrogen gas
- c) Oxygen gas
- d) None of the above

Correct option: b) Hydrogen gas

29.Which of the following indicates a decrease in oxidation state?

a) Oxidation

- b) Reduction
- c) Neutralization
- d) Combustion

Correct option: b) Reduction

30.What is the main component of an electrolytic cell?

- a) Anode
- b) Cathode

c) Electrolyte

d) All of the above

Correct option: d) All of the above

31. The oxidation state of nitrogen in ammonia (NH₃) is:

a) -3

b) +3

- c) +1
- d) 0

Correct option: a) -3

32.What happens during the corrosion of metals?

a) Metals are reduced

b) Metals are oxidized

c) Metals gain mass

d) Metals become more conductive

Correct option: b) Metals are oxidized

33.Which of the following compounds is a product of rusting?

a) FeO

b) Fe₂O₃·nH₂O

c) FeS

d) FeCl₃

Correct option: b) Fe₂O₃-nH₂O

34. The oxidation state of zinc in ZnO is:

a) +1

b) +2

c) 0

d) -2

Correct option: b) +2

35.Which of the following is an example of a spontaneous reaction?

a) Electrolysis of water

b) Rusting of iron

c) Electroplating

d) <mark>Bakin</mark>g soda decompos<mark>itio</mark>n

Correct option: b) Rusting of iron

36.The main purpose of using reducing agents in reactions is to:

- a) Enhance oxidation
- b) Facilitate electron gain

c) Facilitate electron loss

d) None of the above

Correct option: b) Facilitate electron gain

37. Which of the following statements is true about a galvanic cell?

- a) It consumes energy
- b) It generates electrical energy
- c) It requires an external power source
- d) It operates only in a vacuum

Correct option: b) It generates electrical energy

38.In the electrolysis of water, what gas is produced at the anode?

- a) Hydrogen
- b) Oxygen
- c) Nitrogen
- d) Carbon dioxide

Correct option: b) Oxygen

39.What is the oxidation state of chlorine in HCIO₄?

- a) +5
- b) +7
- c) +1
- d) -1

Correct option: b) +7

40.Which of the following is a primary characteristic of acids?

- a) Bitter taste
- b) Slippery feel
- c) Sour taste
- d) Non-corrosive

Correct option: c) Sour taste

41.The process of converting an ore to a pure metal is called:

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- a) Reduction
- b) Refining
- c) Oxidation
- d) Smelting

Correct option: b) Refining

42.Which of the following increases the rate of rusting?

- a) Dry air
- b) High temperature
- c) Low humidity
- d) Coating with oil

Correct option: b) High temperature

43. The main component of galvanization is:

- a) Lead
- b) Tin
- c) Zinc
- d) Copper
- **Correct option: c) Zinc**

44.In electroplating, the object to be plated acts as: a) Anode b) Cathode
c) Electrolyte
d) Power source
Correct option: b) Cathode

45.Which of the following reactions is an example of a redox reaction?

a) NaCl \rightarrow Na + Cl₂ b) H₂ + O₂ \rightarrow H₂O c) HCl + NaOH \rightarrow NaCl + H₂O d) CaCO₃ \rightarrow CaO + CO₂ Correct option: b) H₂ + O₂ \rightarrow H₂O

46.The oxidation state of oxygen in most compounds is:

a) -2

b) -1

c) 0

d) +2

Correct option: a) -2

47.Which of the following represents a reducing environment?

a) High concentration of O₂

b) High concentration of H₂

c) Neutral pH

d) High temperature

Correct option: b) High concentration of H₂

48.What is the oxidation state of carbon in CO₂?

a) +2

b) +4

c) 0

d) -4

Correct option: b) +4

49.Which of the following is a characteristic of strong acids?

a) They do not ionize in water

b) They have a high pH

c) They completely dissociate in water

d) They are non-corrosive

Correct option: c) They completely dissociate in water

50. Which metal is commonly used in cathodic protection?

a) Copper

b) Magnesium

c) Iron

d) Aluminum Correct option: b) Magnesium

51.In the reaction CuO + $H_2 \rightarrow$ Cu + H_2O , CuO acts as a:

a) Reducing agent

b) Oxidizing agent

c) Catalyst

d) Electrolyte

Correct option: b) Oxidizing agent

52.The oxidation state of phosphorus in phosphoric acid (H₃PO₄) is:

a) +5

b) +3

c) 0

d) -3

Correct option: a) +5

53. What type of reaction occurs when magnesium reacts with hydrochloric acid?

- a) Endothermic reaction
- b) Exothermic reaction

c) Redox reaction

d) Combustion reaction

Correct option: c) Redox reaction

54.The main component in the formation of acid rain is:

a) Carbon dioxide

b) Sulfur dioxide

- c) Nitrogen
- d) Oxygen

Correct option: b) Sulfur dioxide

55.Which of the following is a primary component of rust?

- a) FeO
- b) Fe_2O_3
- c) Fe₂O₃-nH₂O
- d) Fe_3O_4

Correct option: c) Fe₂O₃·nH₂O

56.What is the oxidation state of iron in FeCl₃?

a) +1 b) +2 c) +3 d) 0 Correct option: c) +3 57.An example of a non-spontaneous reaction is:

- a) Photosynthesis
- b) Combustion
- c) Electrolysis of water
- d) Rusting of iron

Correct option: c) Electrolysis of water

58.The electrochemical series ranks elements based on their:

- a) Atomic mass
- b) Ionization energy
- c) Electrode potentials
- d) Oxidation states
- **Correct option: c) Electrode potentials**

Chapter 8:Energetics

MCQs;

1. The branch of chemistry that deals with energy changes in chemical reactions is called:

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- a) Th<mark>ermo</mark>dynamics
- b) El<mark>ectroc</mark>hemistry
- c) Energetics
- d) Organic chemistry

Answer: c) Energetics

- 2. Energy changes in a chemical reaction occur due to:
- a) Breaking and making of bonds
- b) Change in pressure
- c) Increase in mass
- d) Addition of a catalyst

Answer: a) Breaking and making of bonds

- 3. The SI unit of energy is:
- a) Joule
- b) Calorie
- c) Watt
- d) Newton

Answer: a) Joule

4. The amount of heat absorbed or released in a chemical reaction is called:

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- a) Heat capacity
- b) Enthalpy change
- c) Work done
- d) Activation energy

Answer: b) Enthalpy change

- 5. The law of conservation of energy states that:
- a) Energy can be created but not destroyed
- b) Energy can be destroyed but not created
- c) Energy can neither be created nor destroyed
- d) Energy is infinite

Answer: c) Energy can neither be created nor destroyed

- 6. Reactions that release heat energy are called:
- a) Exothermic reactions
- b) Endothermic reactions
- c) Reversible reactions
- d) Electrochemical reactions

Answer: a) Exothermic reactions

- 7. An example of an exothermic reaction is:
 a) Photosynthesis
 b) Melting of ice
 c) Combustion of fuel
 d) Electrolysis of water
 Answer: c) Combustion of fuel
- 8. In an exothermic reaction, the enthalpy change (ΔH) is:
 a) Positive
 b) Negative
 c) Zero
 d) Cannot be determined
 Answer: b) Negative
- 9. Endothermic reactions:
- a) Absorb heat from surroundings
- b) Release heat into surroundings

c) Have no energy changed) Are always fast reactionsAnswer: a) Absorb heat from surroundings

10. An example of an endothermic reaction is:
a) Respiration
b) Freezing of water
c) Photosynthesis
d) Burning of wood
Answer: c) Photosynthesis

11. The enthalpy change of a reaction is represented as:
a) ΔT
b) ΔH
c) ΔP
d) ΔE
Answer: b) ΔH

12. The energy difference between reactants and products is called:
a) Activation energy
b) Enthalpy change
c) Bond energy
d) Potential energy

Answer: b) Enthalpy change

13. A reaction with a positive ΔH value is:

a) Exothermic

- b) Endothermic
- c) Spontaneous
- d) Non-spontaneous

Answer: b) Endothermic

14. The activation energy of a reaction is:

- a) The energy required to start the reaction
- b) The energy released during the reaction
- c) The final energy of products
- d) The potential energy of reactants

Answer: a) The energy required to start the reaction

15. Catalysts work by:

- a) Increasing activation energy
- b) Decreasing activation energy

c) Increasing reaction temperatured) Absorbing heatAnswer: b) Decreasing activation energy

16. Heat capacity is defined as:
a) Heat energy required to raise the temperature of 1g of a substance by 1°C
b) Heat energy required to raise the temperature of a given substance
c) Total heat stored in a substance
d) Heat energy released by a substance
Answer: b) Heat energy required to raise the temperature of a given substance

17. Specific heat capacity is measured in:

a) J/g°C

b) J/kg

c) Joules

d) Newtons

Answer: a) J/g°C

18. Water has a high specific heat capacity, meaning it:

a) Heats up quickly

b) Stores and retains heat longer

c) Freezes faster than metals

d) Cannot store heat

Answer: b) Stores and retains heat longer

19. The formula for heat energy is:
a) Q = mcΔT
b) Q = mgh
c) Q = mv²
d) Q = pV
Answer: a) Q = mcΔT

20. The SI unit of heat capacity is: a) J/kg b) J/K c) J/m² d) J/s Answer: b) J/K

21. The energy required to break a bond is called:

a) Enthalpy

b) Bond energy

c) Activation energy

d) Kinetic energy

Answer: b) Bond energy

22. If bond breaking absorbs energy and bond formation releases energy, a reaction is exothermic when:

- a) Bond breaking requires more energy than bond formation
- b) Bond formation releases more energy than bond breaking
- c) Both processes require equal energy
- d) No bonds are broken

Answer: b) Bond formation releases more energy than bond breaking

- 23. Hess's Law states that:
- a) Total enthalpy change depends on the path of reaction
- b) Enthalpy change of a reaction is independent of the reaction path
- c) Enthalpy cannot change
- d) Only spontaneous reactions release energy

Answer: b) Enthalpy change of a reaction is independent of the reaction path

- 24. Hess's Law is useful for:
- a) Determining activation energy
- b) Calculating enthalpy change indirectly
- c) Measuring bond energy
- d) Determining reaction rate

Answer: b) Calculating enthalpy change indirectly

25. Bond energy is measured in:

- a) Jo<mark>ules</mark>
- b) kJ/mol
- c) Watts
- d) Calories

Answer: b) kJ/mol

- 26. A spontaneous reaction occurs:
 a) Without external energy
 b) Only at high temperature
 c) Only at low temperature
 d) Only in the presence of a catalyst
 Answer: a) Without external energy
- 27. Entropy (Δ S) is a measure of:
- a) Heat energy
- b) Disorder in a system
- c) Bond strength
- d) Activation energy
Answer: b) Disorder in a system

28. Which of the following increases entropy?
a) Freezing of water
b) Melting of ice
c) Formation of a solid from a gas
d) Condensation of steam
Answer: b) Melting of ice

29. Gibbs free energy (ΔG) determines:
a) Rate of reaction
b) Spontaneity of reaction
c) Bond energy
d) Specific heat capacity
Answer: b) Spontaneity of reaction

30. The main source of energy for living organisms is:
a) Fossil fuels
b) Sunlight
c) Nuclear reactions
d) Wind energy
Answer: b) Sunlight

31. Fossil fuels include:
a) Coal, oil, natural gas
b) Wood, charcoal, LPG
c) Biomass, solar energy, wind energy
d) Uranium, thorium, plutonium
Answer: a) Coal, oil, natural gas

32. The most efficient fossil fuel in terms of energy output is:
a) Coal
b) Natural gas
c) Petroleum
d) Wood
Answer: b) Natural gas

33. Biofuels are obtained from:

a) Fossilized plants

b) Organic matter

c) Nuclear reactions

d) Electrolysis of water

Answer: b) Organic matter

34. Renewable energy sources include:
a) Petroleum and coal
b) Solar and wind energy
c) Natural gas and nuclear energy
d) Diesel and gasoline
Answer: b) Solar and wind energy

35. A major disadvantage of fossil fuels is:

a) High energy production

b) Environmental pollution

c) Easy availability

d) Low cost

Answer: b) Environmental pollution

36. The process of burning fuels to produce energy is called:

a) Combustion

b) Oxidation

c) Reduction

d) Decomposition

Answer: a) Combustion

37. The energy produced by the sun is due to:

a) Nuclear fusion

b) Nuclear fission

c) Combustion

d) Chemical reaction

Answer: a) Nuclear fusion

38. The device used to measure heat changes in reactions is called:

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a) Thermometer

b) Calorimeter

c) Barometer

d) Spectrometer

Answer: b) Calorimeter

39. In a calorimeter, heat loss by a substance is equal to:

a) Heat absorbed by water

b) Heat gained by a thermometer

c) Heat absorbed by the container

d) No heat is lost

Answer: a) Heat absorbed by water

40. The heat absorbed or released is calculated using the formula:

a) $Q = mc\Delta T$ b) Q = P/Vc) Q = mghd) $Q = \Delta H - T\Delta S$ Answer: a) $Q = mc\Delta T$

41. If 100g of water is heated from 25°C to 75°C, the temperature change (ΔT) is:
a) 25°C
b) 50°C
c) 100°C
d) 75°C
Answer: b) 50°C

42. The heat energy required to raise the temperature of 1g of a substance by 1°C is:
a) Heat capacity
b) Specific heat capacity
c) Latent heat
d) Bond energy
Answer: b) Specific heat capacity

43. Water is used in calorimetry because:
a) It has a high specific heat capacity
b) It absorbs heat slowly
c) It is a poor conductor of heat
d) It changes temperature quickly

Answer: a) It has a high specific heat capacity

44. The energy stored in food is measured in:

a) Joules

- b) Calories
- c) Newtons

d) Watts

Answer: b) Calories

45. The combustion of food in the body releases:

- a) Chemical energy
- b) Electrical energy

c) Nuclear energy

d) Gravitational energy

Answer: a) Chemical energy

46. Air conditioners function by:a) Transferring heat from inside to outside

b) Producing cold air
c) Absorbing cold from the atmosphere
d) Generating energy
Answer: a) Transferring heat from inside to outside

47. The body cools down through:
a) Radiation
b) Conduction
c) Evaporation
d) Combustion
Answer: c) Evaporation

48. Fireworks release energy in the form of:
a) Light and heat
b) Electrical energy
c) Sound only

d) Mechanical energy Answer: a) Light and heat

49. Steam engines work on: a) Heat energy conversion b) Electrical energy c) Nuclear energy d) Solar energy Answer: a) Heat energy conversion

50. In an exothermic reaction, temperature of the surroundings:

a) Increases

b) Decreases

c) Remains constant

d) First increases then decreases

Answer: a) Increases

51. In an endothermic reaction, temperature of the surroundings:

a) Increases

b) Decreases

c) Remains the same

d) First decreases then increases

Answer: b) Decreases

52. The heat released when one mole of a substance is burned completely in oxygen is called:

a) Heat of combustion

b) Heat of reaction

c) Heat capacityd) Latent heatAnswer: a) Heat of combustion

53. The main byproduct of burning fuels is:
a) Carbon dioxide
b) Oxygen
c) Hydrogen
d) Nitrogen
Answer: a) Carbon dioxide

54. A substance that increases the rate of reaction without being consumed is called:

- a) Catalyst
- b) Reactant

c) Product

d) Fuel

Answer: a) Catalyst

55. The most common energy source used in power plants is:

- a) Fossil fuels
- b) Solar energy
- c) Bi<mark>omas</mark>s
- d) Wind energy

Answer: a) Fossil fuels

56. The most efficient energy source in nature is:

- a) Sunlight
- b) Coal
- c) Petroleum
- d) Nuclear energy
- Answer: d) Nuclear energy

Chapter 9: Chemical Equilibrium

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MCQs;

- **1. Chemical equilibrium occurs when:**
- a) Forward reaction stops
- b) Backward reaction stops
- c) Forward and backward reactions occur at the same rate
- d) Reactants are completely converted into products

Answer: c) Forward and backward reactions occur at the same rate

2. At equilibrium, the concentration of reactants and products:

a) Becomes zero
b) Continues to change
c) Remains constant
d) Increases continuously
Answer: c) Remains constant

3. A reversible reaction is one that:

- a) Proceeds only in the forward direction
- b) Proceeds only in the backward direction
- c) Occurs in both directions
- d) Stops after some time

Answer: c) Occurs in both directions

4. In a dynamic equilibrium:

- a) Reactions stop completely
- b) The rate of forward and backward reactions is equal
- c) Only the forward reaction continues
- d) The concentration of reactants increases

Answer: b) The rate of forward and backward reactions is equal

- 5. Which of the following is an example of a reversible reaction?
- a) Burning of wood
- b) Rusting of iron
- c) Decomposition of ammonium chloride
- d) Digestion of food
- Answer: c) Decomposition of ammonium chloride
- 6. The equilibrium constant (Kc) is expressed in terms of:
- a) Pressure
- b) Temperature
- c) Concentration
- d) Volume
- Answer: c) Concentration
- 7. The general expression for the equilibrium constant is:
- a) Kc = [Products] / [Reactants]
- b) Kc = [Reactants] / [Products]
- c) Kc = $P \times V$
- d) Kc = mc∆T

Answer: a) Kc = [Products] / [Reactants]

8. A large value of Kc indicates:
a) More reactants than products
b) More products than reactants
c) Equal amounts of reactants and products
d) Reaction has stopped
Answer: b) More products than reactants

9. If Kc is very small, the reaction: a) Favors the products

b) Favors the reactants

c) Is at equilibrium

d) Is spontaneous

Answer: b) Favors the reactants

10. If Kc = 1, it means:

a) Forward reaction is favored

b) Backward reaction is favored

c) Reactants and products are in equal concentrations

d) Reaction is not reversible

Answer: c) Reactants and products are in equal concentrations

11. According to Le Chatelier's principle, if concentration of reactants is increased, equilibrium shifts:

a) Towards reactants

b) Towards products

c) Remains unchanged

d) Becomes zero

Answer: b) Towards products

12. If pressure is increased in a reaction with more gaseous reactants than products, equilibrium shifts:

a) Towards products

b) Towards reactants

c) No effect

d) Reaction stops

Answer: a) Towards products

13. A decrease in temperature favors:

a) Endothermic reaction
b) Exothermic reaction
c) Both reactions equally
d) No effect
Answer: b) Exothermic reaction

14. If a catalyst is added to a reaction at equilibrium:
a) Equilibrium shifts forward
b) Equilibrium shifts backward
c) No effect on equilibrium position
d) Reaction stops
Answer: c) No effect on equilibrium position

15. The removal of a product from an equilibrium system will shift the reaction:
a) Towards reactants
b) Towards products
c) No effect
d) Reaction stops
Answer: b) Towards products

16. The industrial process used for ammonia synthesis is:
a) Haber process
b) Contact process
c) Solvay process
d) Electrolysis
Answer: a) Haber process

17. The equilibrium reaction in the Haber process is: a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ b) $H_2 + CI_2 \rightarrow 2HCI$ c) $CO_2 + H_2O \rightarrow H_2CO_3$ d) $CaCO_3 \rightarrow CaO + CO_2$ Answer: a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

18. The best conditions for maximum ammonia yield are:
a) Low temperature, low pressure
b) Low temperature, high pressure
c) High temperature, low pressure
d) High temperature, high pressure
Answer: b) Low temperature, high pressure

19. The process used for the manufacture of sulfuric acid is:a) Haber processb) Contact process

c) Solvay processd) FermentationAnswer: b) Contact process

20. The catalyst used in the Haber process is:
a) Nickel
b) Platinum
c) Iron
d) Copper
Answer: c) Iron

21. A reaction reaches equilibrium when:

a) The reaction stops completely

b) The rates of forward and reverse reactions are equal

c) Reactants are used up

d) Only products remain

Answer: b) The rates of forward and reverse reactions are equal

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- 22. The equilibrium constant is dependent on:
- a) Pr<mark>essur</mark>e
- b) Catalyst
- c) Temperature
- d) S<mark>urface</mark> area
- Answer: c) Temperature

23. The reaction quotient (Q) is used to:

- a) Determine if a system is at equilibrium
- b) Measure reaction speed
- c) Identify catalysts
- d) Change the equilibrium constant
- Answer: a) Determine if a system is at equilibrium

24. If Q < Kc, the reaction: a) Moves forward b) Moves backward c) Is at equilibrium d) Stops Answer: a) Moves forward

25. In a reversible reaction, equilibrium is disturbed by:

- a) Catalyst addition
- b) Volume change
- c) Stirring

d) Color change Answer: b) Volume change

26. When a system at equilibrium is disturbed, it shifts in a direction that:

a) Minimizes the disturbance

b) Stops the reaction

c) Converts all reactants into products

d) Forms a new equilibrium constant

Answer: a) Minimizes the disturbance

27. If pressure is decreased in a reaction with more gaseous reactants than products, equilibrium shifts:

a) Towards reactants

b) Towards products

c) No effect

d) Reaction stops

Answer: a) Towards reactants

28. When a reaction is exothermic, an increase in temperature will shift the equilibrium:

a) Towards products

b) Towards reactants

c) No change

d) Increase the reaction speed

Answer: b) Towards reactants

29. Which factor does not affect the equilibrium position?

a) Temperature

b) Catalyst

c) Pr<mark>essur</mark>e

d) Concentration

Answer: b) Catalyst

30. In a closed system at equilibrium:

a) No reactions occur

b) Only the forward reaction occurs

c) Only the backward reaction occurs

d) Forward and backward reactions occur at equal rates

Answer: d) Forward and backward reactions occur at equal rates

31. If more reactants are added to a system at equilibrium, the reaction shifts:

a) Towards products

b) Towards reactants

c) No effect

d) Stops the reaction

Answer: a) Towards products

32. If heat is added to an endothermic reaction, equilibrium shifts:

a) Towards products

b) Towards reactants c) No effect

d) Reaction stops

Answer: a) Towards products

33. What happens to the equilibrium constant (Kc) when temperature increases in an exothermic reaction?

- a) Increases
- b) Decreases
- c) Remains unchanged

d) Becomes zero

Answer: b) Decreases

34. What happens to equilibrium when a gas is removed from a gaseous reaction system?

- a) Shifts towards the removed gas
- b) Shifts away from the removed gas
- c) No effect
- d) Reaction stops

Answer: a) Shifts towards the removed gas

35. In an equilibrium reaction, increasing the surface area of a solid reactant will:
a) Change the equilibrium position
b) Increase reaction rate but not change equilibrium
c) Stop the reaction

d) Change the value of Kc

Answer: b) Increase reaction rate but not change equilibrium

36. If Q > Kc, the reaction:
a) Moves forward
b) Moves backward
c) Is at equilibrium
d) Stops
Answer: b) Moves backward

37. The unit of equilibrium constant depends on:

- a) Type of reaction
- b) Number of moles of reactants and products
- c) Temperature only
- d) Pressure only

Answer: b) Number of moles of reactants and products

38. The equilibrium constant Kc changes with:

- a) Concentration
- b) Pressure
- c) Catalyst
- d) Temperature

Answer: d) Temperature

39. In the reaction $N_2O_4 \rightleftharpoons 2NO_2$, increasing the pressure will:

- a) Shift equilibrium towards reactants
- b) Shift equilibrium towards products
- c) Stop the reaction
- d) No effect

Answer: a) Shift equilibrium towards reactants

40. In the equilibrium expression Kc = [C]² / [A][B], what does the exponent 2 represent?
a) The concentration of reactants
b) The coefficient of C in the balanced equation

- c) The rate of reaction
- d) The activation energy

Answer: b) The coefficient of C in the balanced equation

41. The equilibrium reaction in the Contact process is: a) $2SO_2 + O_2 \rightleftharpoons 2SO_3$ b) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ c) $CaCO_3 \rightleftharpoons CaO + CO_2$ d) $H_2 + CI_2 \rightleftharpoons 2HCI$ Answer: a) $2SO_2 + O_2 \rightleftharpoons 2SO_3$

42. The best temperature for maximum sulfuric acid production is:
a) High temperature
b) Low temperature
c) Moderate temperature
d) No effect
Answer: c) Moderate temperature

43. In ammonia synthesis, why is high pressure used?

- a) To increase reactant concentration
- b) To shift equilibrium towards more ammonia production
- c) To decrease reaction speed
- d) To stop side reactions

Answer: b) To shift equilibrium towards more ammonia production

44. What catalyst is used in the Contact process?
a) Iron
b) Platinum
c) Copper
d) Nickel
Answer: b) Platinum

45. Which gas is removed in the Solvay process to maintain equilibrium?
a) Ammonia
b) Carbon dioxide
c) Hydrogen
d) Sulfur dioxide

Answer: b) Carbon dioxide

46. Which reaction is irreversible? a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ b) $H_2O(I) \rightleftharpoons H_2O(g)$ c) Burning of methane d) $CO_2 + H_2O \rightleftharpoons H_2CO_3$ Answer: c) Burning of methane

47. What happens when a catalyst is removed from a reaction at equilibrium?
a) Reaction stops
b) Reaction rate decreases
c) Equilibrium shifts
d) No effect
Answer: b) Reaction rate decreases

48. What is the effect of adding an inert gas to an equilibrium system at constant volume?
a) Equilibrium shifts
b) Kc changes
c) No effect
d) Reaction stops
Answer: c) No effect

49. The Haber process is an example of:

a) Physical equilibrium

b) Chemical equilibrium

c) Static equilibrium

d) Irreversible reaction

Answer: b) Chemical equilibrium

50. Which reaction is favored by increasing pressure? a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ b) $2H_2O \rightleftharpoons 2H_2 + O_2$ c) $CaCO_3 \rightleftharpoons CaO + CO_2$ d) $H_2 + I_2 \rightleftharpoons 2HI$ Answer: a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

51. Equilibrium in a system means:
a) The reaction has stopped
b) No more reactants are left
c) Forward and backward reaction rates are equal
d) Only reactants remain
Answer: c) Forward and backward reaction rates are equal

52. A catalyst increases the rate of:
a) Only forward reaction
b) Only backward reaction
c) Both forward and backward reactions equally
d) No reaction
Answer: c) Both forward and backward reactions equally

53. The unit of Kc for the reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$ is: a) mol/L b) L/mol c) (mol/L)² d) (L/mol)² Answer: c) (mol/L)²

54. In a chemical reaction at equilibrium:

- a) The concentration of products is always higher
- b) The forward and backward reactions occur at different rates
- c) The concentrations of reactants and products remain constant
- d) Reactants keep increasing

Answer: c) The concentrations of reactants and products remain constant

Chapter 10: Acid, Bases and Salts

MCQs;

- 1. Acids have a:
- a) Bitter taste
- b) Soapy texture

c) Sour taste d) Metallic luster Answer: c) Sour taste

2. Bases turn red litmus paper:
a) Blue
b) Red
c) Green
d) Colorless
Answer: a) Blue

3. Which of the following is a strong acid?
a) H₂CO₃
b) HCI
c) NH₃
d) CH₃COOH
Answer: b) HCI

4. Which of the following is a strong base?
a) NaOH
b) NH₄OH
c) CH₃COOH
d) H₂SO₄
Answer: a) NaOH

5. What happens when an acid reacts with a base?
a) Salt and water are formed
b) Gas is released
c) Only water is formed
d) Temperature decreases
Answer: a) Salt and water are formed

6. The pH of a neutral solution is:
a) 0
b) 7
c) 10
d) 14
Answer: b) 7

7. A solution with pH less than 7 is:
a) Basic
b) Acidic
c) Neutral
d) None of these
Answer: b) Acidic

8. Which indicator is extracted from lichens?

a) Methyl orange

b) Litmus

- c) Phenolphthalein
- d) Universal indicator

Answer: b) Litmus

9. What is the color of phenolphthalein in an acidic solution?
a) Pink
b) Blue
c) Colorless
d) Yellow
Answer: c) Colorless

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10. What is the color of methyl orange in a basic solution?
a) Red
b) Orange
c) Yellow
d) Green
Answer: c) Yellow

11. According to Arrhenius theory, acids produce:
a) OH⁻ ions
b) H⁺ ions
c) Na⁺ ions
d) CI⁻ ions
Answer: b) H⁺ ions

12. According to Bronsted-Lowry theory, bases are:

a) Proton donors

- b) Proton acceptors
- c) Electron donors

d) None of these Answer: b) Proton acceptors

13. NH₃ is considered a base according to:
a) Arrhenius theory
b) Bronsted-Lowry theory
c) Lewis theory
d) None of these
Answer: b) Bronsted-Lowry theory

14. A substance that can act as both acid and base is called:

a) Amphoteric b) Neutral c) Salt d) None of these

Answer: a) Amphoteric

15. Which of the following is an example of an amphoteric substance? a) NaCl b) HCl c) H₂O d) NaOH Answer: c) H₂O

16. The reaction between an acid and a base is called:
a) Oxidation
b) Neutralization
c) Reduction
d) Sublimation
Answer: b) Neutralization

17. What is produced when an acid reacts with a metal?

- a) Salt and water
- b) Salt and hydrogen gas
- c) Base and hydrogen gas
- d) Carbon dioxide and water
- Answer: b) Salt and hydrogen gas

18. What is produced when an acid reacts with a carbonate?

- a) Salt and water
- b) Salt and carbon dioxide
- c) Base and hydrogen gas
- d) Oxygen gas

Answer: b) Salt and carbon dioxide

19. The reaction of sulfuric acid with sodium hydroxide forms: a) $Na_2SO_4 + H_2O$ b) $NaCl + H_2O$ c) $Na_2CO_3 + H_2O$ d) None of these Answer: a) $Na_2SO_4 + H_2O$

20. Which of the following is an acidic oxide?
a) Na₂O
b) CO₂
c) MgO
d) Al₂O₃
Answer: b) CO₂

21. Which of the following is a neutral salt?
a) NaCl
b) NH₄Cl
c) Na₂CO₃
d) CH₃COONa
Answer: a) NaCl

22. A salt formed from a strong acid and a weak base is:
a) Neutral
b) Acidic
c) Basic
d) None of these
Answer: b) Acidic

23. The process of salt formation is called:
a) Sublimation
b) Neutralization
c) Crystallization
d) Precipitation
Answer: b) Neutralization

24. Baking soda is chemically known as:
a) Na₂CO₃
b) NaHCO₃
c) CaCO₃
d) NH₄Cl
Answer: b) NaHCO₃

25. The common name of NaCl is:

a) Baking soda
b) Common salt
c) Washing soda
d) Epsom salt
Answer: b) Common salt

26. The chemical formula of lime water is:
a) Ca(OH)₂
b) CaCO₃
c) Mg(OH)₂
d) NaOH
Answer: a) Ca(OH)₂

27. A strong acid and a strong base will form a salt that is:
a) Acidic
b) Basic
c) Neutral
d) Unstable
Answer: c) Neutral

28. The acid present in vinegar is:
a) Sulfuric acid
b) Acetic acid
c) Citric acid
d) Nitric acid
Answer: b) Acetic acid

29. The acid present in lemon juice is:
a) Acetic acid
b) Sulfuric acid
c) Citric acid
d) Nitric acid
Answer: c) Citric acid

30. Which base is found in soap?
a) NaCl
b) KOH
c) HCl
d) H₂SO₄
Answer: b) KOH

31. The pH of lemon juice is:a) Less than 7

b) More than 7
c) Exactly 7
d) Cannot be determined
Answer: a) Less than 7

32. Which of the following is a weak acid?
a) HCI
b) H₂SO₄
c) CH₃COOH
d) HNO₃
Answer: c) CH₃COOH

33. Which base is used in antacids to relieve acidity?
a) H₂SO₄
b) NaOH
c) Mg(OH)₂
d) HCI
Answer: c) Mg(OH)₂

34. Which acid is found in soft drinks?
a) Nitric acid
b) Phosphoric acid
c) Hydrochloric acid
d) Sulfuric acid
Answer: b) Phosphoric acid

35. An acidic solution has more:
a) OH⁻ ions than H⁺ ions
b) H⁺ ions than OH⁻ ions
c) Equal number of H⁺ and OH⁻ ions
d) None of these
Answer: b) H⁺ ions than OH⁻ ions

36. Which solution has the lowest pH?
a) Vinegar
b) Lemon juice
c) Baking soda
d) Distilled water
Answer: b) Lemon juice

37. A universal indicator gives which color in a neutral solution?

a) Red

b) Yellow

c) Green

d) Blue Answer: c) Green

38. Which of the following solutions will turn blue litmus paper red?

- a) Ammonia
- b) Lime water
- c) Vinegar

d) Soap solution

Answer: c) Vinegar

39. The color of methyl orange in an acidic solution is:

- a) Yellow
- b) Orange
- c) Red

d) Green

Answer: c) Red

40. Which of the following has a pH greater than 7?
a) Lemon juice
b) Orange juice
c) Ammonia solution
d) Vinegar
Answer: c) Ammonia solution

41. The reaction between an acid and a carbonate always produces:
a) Oxygen gas
b) Carbon dioxide gas
c) Hydrogen gas
d) Chlorine gas
Answer: b) Carbon dioxide gas

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42. Which of the following is an amphoteric oxide?
a) Na₂O
b) Al₂O₃
c) SO₂
d) CO₂

Answer: b) Al₂O₃

43. NH₃ is considered a base because it:

a) Accepts protons

- b) Donates protons
- c) Donates electrons
- d) None of these

Answer: a) Accepts protons

44. What is the nature of NaHCO₃ (baking soda)?
a) Acidic
b) Basic
c) Neutral
d) Amphoteric
Answer: d) Amphoteric

45. A salt formed from a weak acid and a strong base is: a) Acidic b) Basic

c) Neutral

d) None of these

Answer: b) Basic

46. The process of obtaining pure salt from a solution by evaporation is called:

- a) Crystallization
- b) Neutralization
- c) Sublimation
- d) Fi<mark>ltratio</mark>n

Answer: a) Crystallization

47. The chemical name of common salt is:
a) Sodium sulfate
b) Sodium chloride
c) Sodium carbonate
d) Sodium hydroxide
Answer: b) Sodium chloride

48. The chemical formula of gypsum is:
a) CaSO₄
b) CaCO₃
c) Na₂CO₃
d) CaSO₄·2H₂O
Answer: d) CaSO₄·2H₂O

49. The salt used in the manufacture of glass is:
a) NaCI
b) Na₂CO₃
c) KCI
d) NH₄CI
Answer: b) Na₂CO₃

50. Which acid is used in car batteries?
a) Hydrochloric acid
b) Nitric acid
c) Sulfuric acid
d) Acetic acid
Answer: c) Sulfuric acid

51. Which base is used in drain cleaners? a) NaCl b) NaOH c) H₂SO₄ d) NH₃ Answer: b) NaOH

52. Which of the following acids is used in the preservation of food?
a) Hydrochloric acid
b) Acetic acid
c) Nitric acid
d) Sulfuric acid
Answer: b) Acetic acid

53. Washing soda is chemically known as: a) Na₂CO₃ b) NaHCO₃ c) CaCO₃ d) NH₄Cl Answer: a) Na₂CO₃

54. The acid used in fertilizers is:
a) Sulfuric acid
b) Hydrochloric acid
c) Nitric acid
d) Acetic acid
Answer: c) Nitric acid

55. Which acid is responsible for the sour taste of yogurt?
a) Acetic acid
b) Lactic acid
c) Sulfuric acid
d) Citric acid
Answer: b) Lactic acid

56. The industrial name of calcium hydroxide is:
a) Quicklime
b) Slaked lime
c) Limestone
d) Gypsum
Answer: b) Slaked lime

57. Which compound is used as a pH buffer in laboratories?
a) NaOH
b) NH₄OH
c) CH₃COOH
d) NaHCO₃
Answer: d) NaHCO₃

58. Which of the following is used in fire extinguishers?
a) H₂SO₄
b) Na₂CO₃
c) NaHCO₃
d) HCI
Answer: c) NaHCO₃

Chapter 11: Environmental Chemistry-Air

MCQs;

The most abundant gas in the atmosphere is:
 a) Oxygen
 b) Nitrogen
 c) Carbon dioxide
 d) Argon
 Answer: b) Nitrogen

2. The percentage of oxygen in air is: a) 21% b) 78% c) 0.03% d) 10% Answer: a) 21%

3. The gas essential for respiration is:
a) CO₂
b) O₂

c) N₂ d) SO₂ Answer: b) O₂

4. The gas responsible for photosynthesis in plants is:
a) CO₂
b) O₂
c) N₂
d) Ar
Answer: a) CO₂

5. Which gas is responsible for acid rain?
a) O₂
b) SO₂
c) N₂
d) Ar
Answer: b) SO₂

6. The major cause of global warming is an increase in:
a) O₂
b) CO₂
c) N₂
d) H₂
Answer: b) CO₂

7. The gas mainly responsible for ozone layer depletion is:
a) CO₂
b) SO₂
c) CFCs
d) N₂
Answer: c) CFCs

8. The main pollutant in industrial smog is:
a) NO₂
b) SO₂
c) O₂
d) Ar
Answer: b) SO₂

9. Carbon monoxide is dangerous because it:

a) Causes global warming

b) Forms acid rain

c) Binds with hemoglobin

d) Enhances plant growth

Answer: c) Binds with hemoglobin

- 10. Photochemical smog is caused by:
 a) NO₂ and sunlight
 b) CO₂ and SO₂
 c) O₂ and N₂
 d) CH₄ and CO
 Answer: a) NO₂ and sunlight
- 11. The ozone layer is found in which atmospheric layer?
 a) Troposphere
 b) Stratosphere
 c) Mesosphere
 d) Thermosphere
 Answer: b) Stratosphere

12. The function of the ozone layer is to:
a) Absorb CO₂
b) Block ultraviolet radiation
c) Trap heat
d) Absorb oxygen
Answer: b) Block ultraviolet radiation

13. The greenhouse gas responsible for global warming is:
a) O₂
b) CO₂
c) N₂
d) Ar
Answer: b) CO₂

14. The phenomenon where heat is trapped in the Earth's atmosphere is called:

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a) Acid rain

b) Greenhouse effect

c) Ozone depletiond) Photochemical smogAnswer: b) Greenhouse effect

15. Acid rain mainly affects:
a) Metal corrosion
b) Soil fertility
c) Aquatic life
d) All of the above
Answer: d) All of the above

16. Which pollutant causes respiratory problems?
a) CO
b) SO₂
c) O₂
d) Ar
Answer: b) SO₂

17. Which gas is called the "silent killer" in air pollution?
a) CO₂
b) CO
c) NO₂
d) CH₄
Answer: b) CO

18. Which type of radiation is blocked by the ozone layer?
a) Infrared
b) Ultraviolet
c) X-rays
d) Radio waves
Answer: b) Ultraviolet

19. Excessive UV radiation can cause:
a) Skin cancer
b) High blood pressure
c) Heart attack
d) Kidney failure

Answer: a) Skin cancer

20. Which layer of the atmosphere contains weather changes?a) Troposphereb) Stratosphere

c) Mesosphere

d) Thermosphere

Answer: a) Troposphere

21. Which gas helps maintain the balance of oxygen and carbon dioxide in nature? a) CO₂

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b) O₂

c) N₂ d) Ar

Answer: a) CO₂

22. Which process removes CO₂ from the atmosphere?
a) Photosynthesis
b) Combustion
c) Respiration
d) Fossil fuel burning
Answer: a) Photosynthesis

23. The best way to reduce CO₂ emissions is to:
a) Increase deforestation
b) Burn more fossil fuels
c) Use renewable energy sources
d) Use more CFCs

Answer: c) Use renewable energy sources

24. Which device is used to control air pollution from industries?

a) Catalytic converter

b) Chimney

c) Air freshener

d) None of these

Answer: a) Catalytic converter

25. The use of unleaded petrol helps reduce:a) Acid rainb) Lead pollution

c) Global warming d) CO₂ emissions Answer: b) Lead pollution

26. Planting more trees helps in:
a) Increasing CO₂
b) Reducing CO₂
c) Increasing greenhouse effect
d) Increasing air pollution
Answer: b) Reducing CO₂

27. The best way to reduce acid rain is to:
a) Increase SO₂ emissions
b) Reduce burning of fossil fuels
c) Increase industrial pollution
d) Increase deforestation
Answer: b) Reduce burning of fossil fuels

28. Which alternative energy source produces no air pollution?
a) Coal
b) Wind energy
c) Natural gas
d) Diesel
Answer: b) Wind energy

29. The main purpose of catalytic converters in vehicles is to:
a) Increase fuel efficiency
b) Reduce emissions
c) Increase engine power
d) Produce more CO₂
Answer: b) Reduce emissions

30. Which industry is a major source of air pollution?

a) Textile

b) Petroleum

c) Pharmaceutical

d) Agriculture

Answer: b) Petroleum

31. The burning of fossil fuels releases:
a) O₂
b) CO₂
c) Ar
d) H₂
Answer: b) CO₂

32. A major way to reduce global warming is to:

- a) Increase fossil fuel use
- b) Reduce greenhouse gas emissions
- c) Increase deforestation
- d) Use CFCs

Answer: b) Reduce greenhouse gas emissions

33. The best way to protect the ozone layer is to:
a) Reduce CO₂ emissions
b) Reduce the use of CFCs
c) Increase fossil fuel burning

d) U<mark>se mo</mark>re pesticides

Answer: b) Reduce the use of CFCs

34. Which of the following gases is not a pollutant?

a) CO b) SO₂

c) O_2

d) NO_2

Answer: c) O₂

Chapter 12: Environmental Chemistry – Water

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MCQs;

1. The chemical formula of water is:

- a) H_2O_2
- b) H₂O
- c) HO₂

d) H_2O_3

Answer: b) H₂O

2. Water covers approximately how much of the Earth's surface?

a) 50% b) 60% c) 70% d) 80% Answer: c) 70%

3. The percentage of fresh water available for human use is approximately:
a) 97%
b) 50%

c) 10%

d) 3% Answer: d) 3%

4. The property of water that allows it to dissolve many substances is called:

a) Polarity

b) Viscosity

- c) Surface tension
- d) Capillarity

Answer: a) Polarity

5. Which type of bonding is present between water molecules?
a) lonic bonds
b) Covalent bonds
c) Hydrogen bonds
d) Metallic bonds
Answer: c) Hydrogen bonds

6. The major cause of water pollution is:
a) Industrial waste
b) Deforestation
c) Noise pollution
d) Ozone depletion

Answer: a) Industrial waste

7. Which of the following is a major biological pollutant of water?

- a) Heavy metals
- b) Bacteria and viruses
- c) Pesticides
- d) Plastic waste

Answer: b) Bacteria and viruses

- 8. Excessive growth of algae due to nutrient pollution is called:
- a) Biodegradation
- b) Eutrophication
- c) Salinization
- d) Desalination
- **Answer: b) Eutrophication**
- 9. The major cause of eutrophication is the presence of excessive:
- a) Oxygen
- b) Nitrogen and phosphorus
- c) Carbon dioxide
- d) Sulfur dioxide

Answer: b) Nitrogen and phosphorus

10. Which disease is mainly caused by drinking contaminated water?

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- a) Tuberculosis
- b) Cholera
- c) Diabetes
- d) Hypertension
- Answer: b) Cholera
- 11. Which of the following is not a water pollutant?
- a) Lead
- b) Mercury
- c) Oxygen
- d) Nitrate

Answer: c) Oxygen

12. The major source of mercury pollution in water is:

- a) Agriculture
- b) Plastic waste
- c) Industrial discharge
- d) Oil spills
- Answer: c) Industrial discharge

13. Acid rain lowers the pH of water bodies due to the presence of:

a) H₂O₂
b) SO₂ and NO₂
c) CH₄ and CO₂
d) NH₃ and HCI
Answer: b) SO₂ and NO₂

14. High levels of lead in drinking water can cause:
a) Bone fractures
b) Kidney damage
c) Lung cancer
d) Diabetes
Answer: b) Kidney damage

15. Oil spills mainly affect:
a) Marine life
b) Desert plants
c) Mountain ecosystems
d) Groundwater
Answer: a) Marine life

16. Excess nitrate in drinking water can cause:
a) Methemoglobinemia (blue baby syndrome)
b) Cholera
c) Lung cancer
d) Hypertension

Answer: a) Methemoglobinemia (blue baby syndrome)

17. The high concentration of arsenic in drinking water is harmful to:

- a) Lungs
- b) Liver
- c) Skin and nervous system
- d) Eyes

Answer: c) Skin and nervous system

18. The most toxic heavy metal pollutant in water is:

- a) Sodium
- b) Potassium
- c) Mercury
- d) Calcium

Answer: c) Mercury

- 19. The best method to remove germs from water is:
- a) Boiling
- b) Filtration
- c) Adding salt
- d) Freezing
- **Answer: a) Boiling**

20. The process of removing salt from seawater is called:

- a) Filtration
- b) Distillation

c) Desalination

- d) Purification
- **Answer: c) Desalination**

21. Which method is most effective for removing suspended particles from water? a) Boiling b) Filtration c) Chlorination d) Aeration DCH BADLO BY MA

Answer: b) Filtration

22. Which chemical is commonly used for water chlorination?

- a) NaCl
- b) CaO
- c) NaOCI
- d) KCI

Answer: c) NaOCI

23. The most effective way to reduce water pollution is to:

- a) Increase industrial waste discharge
- b) Use more fertilizers
- c) Treat wastewater before disposal
- d) Use plastic pipes for water supply

Answer: c) Treat wastewater before disposal

24. Which technique is used in water treatment plants?

a) Sedimentation
b) Filtration
c) Chlorination
d) All of the above
Answer: d) All of the above

25. The best way to conserve water at home is to:
a) Use excess water for cleaning
b) Fix leaking taps
c) Wash clothes in running water
d) Use more detergent
Answer: b) Fix leaking taps

26. The process by which water turns into vapor is called:
a) Condensation
b) Evaporation
c) Precipitation
d) Infiltration
Answer: b) Evaporation

27. The continuous movement of water in nature is called the:
a) Water distribution system
b) Water cycle
c) Water network
d) Water filter
Answer: b) Water cycle

28. The largest source of fresh water on Earth is:
a) Rivers
b) Lakes
c) Glaciers and ice caps
d) Underground water
Answer: c) Glaciers and ice caps

29. Groundwater is stored in:
a) Oceans
b) Aquifers
c) Atmosphere
d) Rivers
Answer: b) Aquifers

30. The main cause of groundwater depletion is:

a) Deforestation

b) Overuse of water resources

c) Increase in rainfall

d) Use of pesticides

Answer: b) Overuse of water resources

31. Thermal pollution of water is caused by:

- a) Hot water discharge from industries
- b) Agricultural waste

c) Plastic pollution

d) Eutrophication

Answer: a) Hot water discharge from industries

32. Which gas is mainly responsible for ocean acidification? a) O₂ b) CO₂ c) CH₄ d) N₂ Answer: b) CO₂

33. The primary source of water for human consumption is:
a) Oceans
b) Groundwater
c) Icebergs
d) Water vapor
Answer: b) Groundwater

34. Reverse osmosis is used to:
a) Increase salt in water
b) Purify water
c) Pollute water
d) Make water alkaline
Answer: b) Purify water

35. The pH of pure water is: a) 5
b) 7 c) 9 d) 11 Answer: b) 7

Chapter 13:Organic Chemistry

MCQs;

1. Organic chemistry is the study of compounds containing:

a) Oxygen

b) Hydrogen

c) Carbon

d) Nitrogen

Answer: c) Carbon

2. Which element is the backbone of organic compounds?

a) Oxygen

- b) Hydrogen
- c) Carbon

d) Sulfur

Answer: c) Carbon

3. The property of carbon that allows it to form long chains is called:

a) Is<mark>omeri</mark>sm

b) Catenation

c) Hybridization

d) Substitution

Answer: b) Catenation

- 4. The simplest organic compound is:
- a) Methane
- b) Ethane
- c) Benzene
- d) Acetic acid

Answer: a) Methane

5. The branch of chemistry that deals with hydrocarbons and their derivatives is called:

a) Physical Chemistry

b) Inorganic Chemistry

c) Analytical Chemistry

d) Organic Chemistry Answer: d) Organic Chemistry

6. Organic compounds mainly consist of:
a) Carbon and hydrogen
b) Carbon and oxygen
c) Carbon and nitrogen
d) Carbon and chlorine
Answer: a) Carbon and hydrogen

7. Which of the following is not an organic compound?
a) CH₄
b) C₂H₆O
c) NaCI
d) C₆H₆
Answer: c) NaCI

8. Which of the following is an aliphatic compound?
a) Benzene
b) Ethane

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c) Phenol

d) Toluene

Answer: b) Ethane

9. Aromatic compounds contain a:
a) Triple bond
b) Hydroxyl group
c) Benzene ring

d) Ca<mark>rbonyl group</mark>

Answer: c) Benzene ring

10. The general formula for alkanes is: a) C_nH_{2n} b) C_nH_{2n+2} c) C_nH_{2n-2} d) C_nH_{2n+1} Answer: b) C_nH_{2n+2} 11. Hydrocarbons are composed of:
a) Carbon and oxygen
b) Carbon and hydrogen
c) Carbon and sulfur
d) Carbon and nitrogen
Answer: b) Carbon and hydrogen

12. Alkanes are also called:
a) Olefins
b) Paraffins
c) Aromatics
d) Alkynes
Answer: b) Paraffins

13. The simplest alkene is:
a) Methane
b) Ethene
c) Propane
d) Butane
Answer: b) Ethene

14. The functional group of alkynes is: a) –OH b) –C≡C– c) –COOH d) –NH₂ Answer: b) –C≡C–

15. Which of the following is an unsaturated hydrocarbon?
a) Methane
b) Propane
c) Butene
d) Ethane
Answer: c) Butene

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16. The functional group of alcohols is:
a) –OH
b) –COOH
c) –NH₂

d) –CHO Answer: a) –OH

17. Which of the following contains a carboxyl group?
a) Alcohol
b) Aldehyde
c) Carboxylic acid
d) Ketone
Answer: c) Carboxylic acid

18. Amines contain which functional group?
a) -OH
b) -COOH
c) -NH₂
d) -CHO
Answer: c) -NH₂

19. Which functional group is present in ketones? a) -COOH b) -C=O c) -OH d) -NH₂ Answer: b) -C=O

20. The general formula for carboxylic acids is: a) R-OH b) R-COOH c) R-CHO d) R-C=O Answer: b) R-COOH

21. Compounds with the same molecular formula but different structural formulas are called:a) Isotopes

a) isotopes

b) Isomers

c) Polymers

d) Monomers

Answer: b) Isomers

22. Which of the following is an isomer of butane?
a) Ethane
b) Isobutane
c) Propane
d) Methane
Answer: b) Isobutane

23. Geometrical isomerism occurs in:
a) Alkanes
b) Alkenes
c) Alkynes
d) Alcohols
Answer: b) Alkenes

24. Optical isomers have the same:
a) Physical properties
b) Chemical properties
c) Molecular formula
d) All of the above
Answer: d) All of the above

25. Methanol is commonly used as:
a) A fuel
b) A food preservative
c) A disinfectant
d) A plastic material
Answer: a) A fuel

26. Ethanol is present in:
a) Vinegar
b) Alcoholic beverages
c) Soap
d) Cooking oil
Answer: b) Alcoholic beverages

27. Which organic compound is used in perfumes?

- a) Aldehydes
- b) Esters
- c) Ketones
- d) Amines

Answer: b) Esters

28. The main component of vinegar is:
a) Ethanol
b) Acetic acid
c) Methanol
d) Propanoic acid
Answer: b) Acetic acid

29. Polymers are formed by the process of:
a) Oxidation
b) Polymerization
c) Fermentation
d) Hydrolysis
Answer: b) Polymerization

30. Nylon is an example of:
a) Natural polymer
b) Synthetic polymer
c) Metal
d) Carbohydrate
Answer: b) Synthetic polymer

31. Which of the following is a natural polymer?
a) Nylon
b) Polyester
c) Cellulose
d) Polystyrene
Answer: c) Cellulose

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32. The chemical formula of benzene is: a) C_6H_{12} b) C_6H_6 c) C_6H_{10} d) C_6H_{14} Answer: b) C_6H_6

33. Petroleum is a mixture of:

a) Organic compounds
b) Metals
c) Inorganic salts
d) Water
Answer: a) Organic compounds

34. The process of breaking large hydrocarbons into smaller ones is called:
a) Hydrogenation
b) Cracking
c) Fermentation
d) Polymerization
Answer: b) Cracking

35. Ethanol is commonly used in:
a) Soap making
b) Drinks
c) Fertilizers
d) Plastics
Answer: b) Drinks

36. The process of slow decomposition of large hydrocarbons into smaller ones is called:
a) Fermentation
b) Polymerization
c) Cracking

d) Neutralization

Answer: c) Cracking

37. The molecular formula of propane is: a) C_2H_6 b) C_3H_8 c) C_4H_{10} d) C_5H_{12} Answer: b) C_3H_8

38. The first member of the alkene series is:

- a) Ethene
- b) Methane
- c) Propene

d) Butene Answer: a) Ethene

39. Coal, petroleum, and natural gas are collectively known as:
a) Fossil fuels
b) Renewable sources
c) Organic waste
d) Synthetic fuels
Answer: a) Fossil fuels

40. Which organic compound is used in nail polish remover?

- a) Methanol
- b) Ethanol
- c) Acetone
- d) Ether
- **Answer: c) Acetone**

41. Soap is prepared by the reaction of fats with:
a) Acids
b) Bases
c) Alcohols
d) Esters

Answer: b) Bases

42. The process of making soap is called:

- a) Hydrolysis
- b) Fermentation
- c) Saponification
- d) Reduction

Answer: c) Saponification

43. Teflon is a polymer used in:
a) Medicines
b) Non-stick cookware
c) Cement
d) Pesticides

Answer: b) Non-stick cookware

44. The main component of LPG (Liquefied Petroleum Gas) is:
a) Methane
b) Propane and Butane
c) Ethane
d) Acetylene
Answer: b) Propane and Butane

45. Which organic compound is commonly used in the dry cleaning industry?
a) Ethanol
b) Benzene
c) Tetrachloroethylene
d) Methanol
Answer: c) Tetrachloroethylene

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46. Which of the following is an aromatic hydrocarbon?
a) Methane
b) Ethanol
c) Benzene
d) Acetone
Answer: c) Benzene

47. Ethyne is also known as:
a) Ethanol
b) Acetylene
c) Propane
d) Butane
Answer: b) Acetylene

48. Which organic compound is present in vinegar?
a) Acetic acid
b) Formic acid
c) Oxalic acid
d) Hydrochloric acid
Answer: a) Acetic acid

49. Which of the following hydrocarbons contains a triple bond?

- a) Ethane
- b) Ethene
- c) Ethyne

d) Propane Answer: c) Ethyne

50. The functional group of aldehydes is: a) –OH b) –COOH c) –CHO d) –NH₂ Answer: c) –CHO

51. The functional group of ketones is: a) -COOH b) -OH c) -C=O d) -CHO Answer: c) -C=O

52. The molecular formula of methanol is: a) CH₄ b) CH₃OH c) CH₂O d) C₂H₆O Answer: b) CH₃OH

53. Esters are formed by the reaction of:
a) Alcohol and acid
b) Alcohol and base
c) Alcohol and alkane
d) Alcohol and ketone
Answer: a) Alcohol and acid

54. A narcotic drug used as an anesthetic is:
a) Ethanol
b) Chloroform
c) Methanol
d) Phenol
Answer: b) Chloroform

- 55. The chemical formula of butane is: a) C_3H_8 b) C_4H_{10} c) C_2H_6 d) C_6H_{14} Answer: b) C_4H_{10}
- 56. The main source of natural gas is:
 a) Coal
 b) Petroleum
 c) Crude oil
 d) Methane
 Answer: d) Methane
- 57. Ethanol is also known as:
 a) Wood alcohol
 b) Grain alcohol
 c) Acetone
 d) Glycerol
 Answer: b) Grain alcohol
- 58. The main constituent of biogas is:
 a) Carbon dioxide
 b) Propane
 c) Methane
 d) Ethane
 Answer: c) Methane
- 59. The gas used in welding is:
 a) Ethene
 b) Ethyne
 c) Butane
 d) Methane
 Answer: b) Ethyne

60. The most important natural source of organic compounds is:

- a) Air
- b) Water
- c) Petroleum

d) Sand Answer: c) Petroleum

Chapter 14:Hydrocarbons

MCQs;

- 1. Hydrocarbons are compounds composed of:
- a) Carbon and hydrogen
- b) Carbon and oxygen
- c) Carbon and nitrogen
- d) Hydrogen and oxygen

Answer: a) Carbon and hydrogen

- 2. Which of the following is not a hydrocarbon?
- a) Methane
- b) Nitrogen
- c) Propane
- d) Butane
- Answer: b) Nitrogen
- 3. Hydrocarbons are classified into:
- a) Al<mark>kanes</mark> and alkynes
- b) Alkanes, alkenes, and alkynes
- c) Saturated and unsaturated hydrocarbons
- d) Both b and c

Answer: d) Both b and c

- 4. Alkanes are also called: a) Saturated hydrocarbons
- b) Unsaturated hydrocarbons
- c) Aromatic hydrocarbons
- d) Cycloalkanes

Answer: a) Saturated hydrocarbons

- 5. The simplest hydrocarbon is:
- a) Ethane
- b) Propane
- c) Methane

d) Butane Answer: c) Methane

- 6. The general formula of alkanes is: a) C_nH_{2n} b) C_nH_{2n+2} c) C_nH_{2n-2} d) $C_nH_{2n+1}OH$ Answer: b) C_nH_{2n+2}
- 7. The molecular formula of butane is: a) C_3H_8 b) C_2H_6 c) C_4H_{10} d) C_5H_{12} Answer: c) C_4H_{10}

8. Alkanes are found in:
a) Natural gas
b) Coal
c) Air
d) Water
Answer: a) Natural gas

- 9. Which alkane is a major component of LPG?
 a) Methane
 b) Ethane
 c) Propane and Butane
 d) Pentane
 Answer: c) Propane and Butane
- 10. Alkanes show which type of bonding?
 a) lonic
 b) Covalent
 c) Metallic
 d) Hydrogen
 Answer: b) Covalent

11. Alkenes are also called:

a) Saturated hydrocarbons
b) Unsaturated hydrocarbons
c) Aromatic hydrocarbons
d) Cyclic hydrocarbons
Answer: b) Unsaturated hydrocarbons

12. The general formula of alkenes is:
a) C_nH_{2n}
b) C_nH_{2n+2}
c) C_nH_{2n-2}
d) C_nH_{2n-4}
Answer: a) C_nH_{2n}

13. The first member of the alkene series is:
a) Methane
b) Ethene
c) Propene
d) Butene
Answer: b) Ethene

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14. Alkenes contain:
a) Single bonds
b) Double bonds
c) Triple bonds
d) No bonds
Answer: b) Double bonds

15. Ethene is used in:
a) Ripening of fruits
b) Fuel production
c) Lubricants
d) Refrigerants
Answer: a) Ripening of fruits

16. The general formula of alkynes is:

a) $C_n H_{2n}$

b) $C_n H_{2n-2}$

- c) $C_n H_{2n+2}$
- d) $C_n H_{2n-4}$

Answer: b) C_nH_{2n-2}

- 17. The first member of the alkyne series is:
- a) Methane
- b) Ethyne
- c) Propene
- d) Butane
- Answer: b) Ethyne

18. Alkynes contain:
a) Single bonds
b) Double bonds
c) Triple bonds
d) No bonds
Answer: c) Triple bonds

19. Ethyne is commonly known as:
a) Acetylene
b) Propane
c) Butane
d) Benzene
Answer: a) Acetylene

20. Ethyne is used in: a) Dry cleaning b) Welding c) Cooking d) Perfumes Answer: b) Welding

21. The major source of hydrocarbons is:
a) Air
b) Water
c) Petroleum
d) Plants
Answer: c) Petroleum

22. Methane is commonly known as: a) LPG

b) Biogasc) Gasolined) KeroseneAnswer: b) Biogas

23. The hydrocarbon present in petrol is:
a) Methane
b) Octane
c) Ethyne
d) Benzene
Answer: b) Octane

24. Hydrocarbons are mostly:
a) Polar
b) Non-polar
c) Ionic
d) Acidic
Answer: b) Non-polar

25. Which hydrocarbon is used as a solvent?
a) Methane
b) Ethanol
c) Benzene
d) Propane
Answer: c) Benzene

26. Alkanes undergo:
a) Addition reactions
b) Substitution reactions
c) Elimination reactions
d) Polymerization
Answer: b) Substitution reactions

27. Alkenes undergo:
a) Addition reactions
b) Substitution reactions
c) Neutralization reactions
d) None of these
Answer: a) Addition reactions

28. Alkynes can be hydrogenated to form:
a) Alkenes
b) Alkanes
c) Both a and b
d) None of these
Answer: c) Both a and b

29. Which process converts crude oil into useful hydrocarbons?
a) Distillation
b) Fermentation
c) Oxidation
d) Electrolysis
Answer: a) Distillation

30. The process of breaking large hydrocarbons into smaller ones is called:a) Polymerizationb) Cracking

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- c) Combustion
- d) Oxidation
- Answer: b) Cracking

31. The major pollutant from burning hydrocarbons is:
a) Carbon dioxide
b) Oxygen
c) Water vapor
d) Hydrogen gas
Answer: a) Carbon dioxide

32. Incomplete combustion of hydrocarbons produces:
a) Carbon monoxide
b) Water
c) Sulfur dioxide
d) Nitrogen gas
Answer: a) Carbon monoxide

33. Acid rain is caused by:a) Sulfur dioxideb) Methane

c) Oxygen d) Propane Answer: a) Sulfur dioxide

34. Which fuel causes the least pollution?
a) Coal
b) Diesel
c) Natural gas
d) Kerosene
Answer: c) Natural gas

35. Hydrocarbons are mainly obtained from:
a) Crude oil
b) Sand
c) Soil
d) Air
Answer: a) Crude oil

36. Petroleum is a mixture of:
a) Only alkanes
b) Alkanes, alkenes, and alkynes
c) Hydrocarbons and other organic compounds
d) Only methane
Answer: c) Hydrocarbons and other organic compounds

37. The main component of natural gas is:

- a) Ethane
- b) Methane
- c) Butane
- d) Propane

Answer: b) Methane

38. The process of refining petroleum is called:

- a) Cracking
- b) Distillation
- c) Fermentation
- d) Oxidation

Answer: b) Distillation

39. Which fraction of crude oil is used for making petrol?
a) Gasoline
b) Diesel
c) Kerosene
d) Lubricating oil
Answer: a) Gasoline

40. The octane number of a fuel tells about:
a) Its viscosity
b) Its efficiency in engines
c) Its molecular weight
d) Its color
Answer: b) Its efficiency in engines

41. The simplest aromatic hydrocarbon is:
a) Methane
b) Benzene
c) Ethene
d) Propane
Answer: b) Benzene

42. Aromatic hydrocarbons have:
a) Single bonds
b) Double bonds
c) Alternating single and double bonds
d) Triple bonds
Answer: c) Alternating single and double bonds

43. Benzene is mainly used in:
a) Medicine
b) Paints and dyes
c) Food
d) Refrigeration
Answer: b) Paints and dyes

44. Toluene is a derivative of:

- a) Ethyne
- b) Benzene
- c) Propane

d) Butane Answer: b) Benzene

45. Which of the following is not an aromatic hydrocarbon?
a) Benzene
b) Toluene
c) Ethane
d) Xylene
Answer: c) Ethane

46. The reaction of alkenes with hydrogen is called:
a) Substitution
b) Hydrogenation
c) Oxidation
d) Fermentation
Answer: b) Hydrogenation

47. The process of burning hydrocarbons in oxygen is called:
a) Oxidation
b) Combustion
c) Substitution
d) Fermentation
Answer: b) Combustion

48. Which product is formed in complete combustion of hydrocarbons?

- a) Carbon dioxide and water
- b) Carbon monoxide and water
- c) Carbon and hydrogen gas
- d) Sulfur dioxide

Answer: a) Carbon dioxide and water

49. Incomplete combustion of hydrocarbons can lead to:

a) Global warming

b) Acid rain

- c) Both a and b
- d) None of these
- Answer: c) Both a and b

50. The reaction in which alkenes react with bromine water is called:
a) Addition reaction
b) Substitution reaction
c) Neutralization reaction
d) Oxidation reaction
Answer: a) Addition reaction

51. Global warming is caused by:
a) Oxygen
b) Carbon dioxide
c) Helium
d) Nitrogen
Answer: b) Carbon dioxide

52. The main cause of acid rain is:
a) Methane
b) Sulfur dioxide
c) Oxygen
d) Carbon monoxide
Answer: b) Sulfur dioxide

53. Which fuel produces the least pollution?
a) Coal
b) Diesel
c) Natural gas
d) Kerosene
Answer: c) Natural gas

54. The major source of hydrocarbons in air pollution is:
a) Vehicles
b) Plants
c) Factories
d) Both a and c
Answer: d) Both a and c

55. Which hydrocarbon is used as a refrigerant?

- a) Methane
- b) Propane
- c) Butane
- d) CFCs

Answer: d) CFCs

56. Which hydrocarbon is used in plastic production?

a) Ethene

b) Propane

c) Methane

d) Butane

Answer: a) Ethene

- 57. LPG is a mixture of: a) Methane and ethane
- b) Butane and propane
- c) Ethene and acetylene
- d) Benzene and toluene
- Answer: b) Butane and propane
- 58. Which hydrocarbon is used in perfumes? a) Benzene b) Toluene c) Methane d) Ethane Answer: b) Toluene
- 59. The main hydrocarbon in kerosene is:
 a) Methane
 b) Octane
 c) Hexane
 d) Propane
 Answer: c) Hexane
- 60. Hydrocarbons are important for:
 a) Fuel
 b) Plastics
 c) Chemicals
 d) All of the above
 Answer: d) All of the above

Chapter 15:Biochemistry

MCQ;

Biochemistry is the study of:
 a) Plants
 b) Chemical processes in living organisms
 c) Rocks and minerals
 d) Atmosphere
 Answer: b) Chemical processes in living organisms

2. The main elements found in living organisms are:
a) Carbon, hydrogen, oxygen, nitrogen
b) Sodium, calcium, chlorine
c) Zinc, iron, copper
d) Helium, neon, argon

Answer: a) Carbon, hydrogen, oxygen, nitrogen

3. Organic compounds in living organisms are mainly composed of:

a) Sodium and potassium

b) Carbon and hydrogen

c) Iron and calcium

d) Nitrogen and sulfur

Answer: b) Carbon and hydrogen

4. Carbohydrates are composed of:
a) Carbon, hydrogen, oxygen
b) Carbon, nitrogen, sulfur
c) Carbon, oxygen, phosphorus
d) Carbon, sulfur, calcium

Answer: a) Carbon, hydrogen, oxygen

- 5. The simplest carbohydrates are called:
- a) Disaccharides

b) Monosaccharides

c) Polysaccharides

d) Oligosaccharides

Answer: b) Monosaccharides

6. Glucose is an example of:

a) Monosaccharide

b) Disaccharide

c) Polysaccharide

d) Protein

Answer: a) Monosaccharide

7. Sucrose is formed by the combination of:

a) Glucose + Fructose

b) Glucose + Galactose

c) Fructose + Maltose

d) Glucose + Ribose

Answer: a) Glucose + Fructose

8. Starch is a: a) Monosaccharide b) Disaccharide c) Polysaccharide d) Protein Answer: c) Polysaccharide

9. The storage form of glucose in animals is:
a) Starch
b) Cellulose
c) Glycogen
d) Protein
Answer: c) Glycogen

10. Cellulose is found in:
a) Animal cells
b) Plant cell walls
c) Human blood
d) Muscles
Answer: b) Plant cell walls

11. Proteins are made up of:
a) Fatty acids
b) Amino acids
c) Nucleotides
d) Monosaccharides
Answer: b) Amino acids

12. The bond that joins amino acids together is called:a) lonic bondb) Peptide bond

c) Hydrogen bondd) Covalent bondAnswer: b) Peptide bond

13. The main function of proteins is:
a) Energy storage
b) Building and repairing body tissues
c) Water absorption
d) None of these
Answer: b) Building and repairing body tissues

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14. Hemoglobin is a:
a) Lipid
b) Protein
c) Carbohydrate
d) Fatty acid
Answer: b) Protein

15. Enzymes are:
a) Carbohydrates
b) Proteins
c) Lipids
d) Nucleic acids
Answer: b) Proteins

16. The building blocks of lipids are:
a) Amino acids
b) Fatty acids and glycerol
c) Monosaccharides
d) Nucleotides
Answer: b) Fatty acids and glycerol

17. The main function of lipids is:
a) Energy storage
b) Oxygen transport
c) DNA replication
d) Water absorption
Answer: a) Energy storage

18. The main component of cell membranes is:a) Proteinsb) Phospholipidsc) Carbohydratesd) DNA

Answer: b) Phospholipids

19. Cholesterol is an example of:
a) Carbohydrate
b) Lipid
c) Protein
d) Vitamin
Answer: b) Lipid

20. DNA and RNA are composed of:
a) Amino acids
b) Nucleotides
c) Fatty acids
d) Sugars
Answer: b) Nucleotides

21. The sugar present in DNA is: a) Ribose b) Deoxyribose c) Glucose d) Fructose Answer: b) Deoxyribose

22. The sugar present in RNA is:
a) Ribose
b) Deoxyribose
c) Glucose
d) Fructose
Answer: a) Ribose

23. The nitrogenous bases in DNA are:
a) A, U, G, C
b) A, T, G, C
c) A, U, C, T

d) G, T, U, C Answer: b) A, T, G, C

24. The nitrogenous base Uracil (U) is found in:
a) DNA
b) RNA
c) Both DNA & RNA
d) None of these
Answer: b) RNA

25. Photosynthesis occurs in:
a) Mitochondria
b) Chloroplast
c) Nucleus
d) Ribosome
Answer: b) Chloroplast

26. Respiration occurs in:
a) Nucleus
b) Mitochondria
c) Golgi apparatus
d) Ribosome
Answer: b) Mitochondria

27. ATP stands for:
a) Adenosine Triphosphate
b) Adenine Tetraphosphate
c) Amino Tri Phosphorus
d) Adenosine Tetraphosphate
Answer: a) Adenosine Triphosphate

28. The energy currency of the cell is:
a) DNA
b) ATP
c) RNA
d) Glucose
Answer: b) ATP

29. The enzyme amylase helps in the digestion of:

a) Proteins
b) Lipids
c) Carbohydrates
d) Nucleic acids
Answer: c) Carbohydrates

30. The main source of Vitamin D is:
a) Sunlight
b) Meat
c) Vegetables
d) Sugar
Answer: a) Sunlight

31. The deficiency of iodine causes:
a) Goiter
b) Rickets
c) Anemia
d) Night blindness
Answer: a) Goiter

32. The most abundant protein in the human body is:
a) Hemoglobin
b) Collagen
c) Insulin
d) Myosin
Answer: b) Collagen