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All the best to AP ECET – 2025 Aspirants

AP ECET – 2025 Chemistry - Chapter wise Preparation

Note: Each question follows the AP ECET exam pattern and is designed to be straightforward and scoring.

Chapter 1: Atomic Structure

Q1. The number of electrons in the outermost shell of an oxygen atom is: (Q1)

- A) 4
- B) 6
- C) 8
- D) 2

✅ Correct Answer: B

Q2. Which of the following particles has the smallest mass? (Q2)

- A) Proton
- B) Neutron
- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q3. The atomic number of an element is equal to: (Q3)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons
- D) Sum of protons and neutrons

✅ Correct Answer: A

Q4. The mass number of an atom is equal to: (Q4)

- A) Number of protons

- B) Number of neutrons
- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q5. Isotopes differ in: (Q5)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q6. The maximum number of electrons that can be accommodated in the L-shell is: (Q6)

- A) 2
- B) 8
- C) 18
- D) 32

✅ Correct Answer: B

Q7. Which of the following is not a fundamental particle of an atom? (Q7)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q8. Who discovered the electron? (Q8)

- A) Rutherford
- B) Bohr
- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q9. The charge on a neutron is: (Q9)

- A) Positive
- B) Negative
- C) Zero

- D) Depends on the isotope

✅ Correct Answer: C

Q10. The nucleus of an atom contains: (Q10)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Q11. Which model explained the existence of energy levels in an atom? (Q11)

- A) Thomson's model
- B) Rutherford's model
- C) Bohr's model
- D) Quantum model

✅ Correct Answer: C

Q12. The number of orbitals in the 'p' subshell is: (Q12)

- A) 1
- B) 2
- C) 3
- D) 6

✅ Correct Answer: C

Q13. The principal quantum number 'n' defines: (Q13)

- A) Shape of orbital
- B) Orientation of orbital
- C) Size and energy of orbital
- D) Spin of electron

✅ Correct Answer: C

Q14. What is the electronic configuration of Na (Z=11)? (Q14)

- A) 2,8,1
- B) 2,8,2
- C) 2,6,3
- D) 1,8,2

✅ Correct Answer: A

Q15. The total number of electrons that can be accommodated in a d-subshell is: (Q15)

- A) 2
- B) 6
- C) 10
- D) 14

✅ Correct Answer: C

Q16. The number of electrons in the outermost shell of an oxygen atom is: (Q16)

- A) 4
- B) 6
- C) 8
- D) 2

✅ Correct Answer: B

Q17. Which of the following particles has the smallest mass? (Q17)

- A) Proton
- B) Neutron
- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q18. The atomic number of an element is equal to: (Q18)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons

- D) Sum of protons and neutrons

✅ Correct Answer: A

Q19. The mass number of an atom is equal to: (Q19)

- A) Number of protons
- B) Number of neutrons
- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q20. Isotopes differ in: (Q20)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q21. The maximum number of electrons that can be accommodated in the L-shell is: (Q21)

- A) 2
- B) 8
- C) 18
- D) 32

✅ Correct Answer: B

Q22. Which of the following is not a fundamental particle of an atom? (Q22)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q23. Who discovered the electron? (Q23)

- A) Rutherford
- B) Bohr
- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q24. The charge on a neutron is: (Q24)

- A) Positive
- B) Negative
- C) Zero
- D) Depends on the isotope

✅ Correct Answer: C

Q25. The nucleus of an atom contains: (Q25)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Q26. Which model explained the existence of energy levels in an atom? (Q26)

- A) Thomson's model
- B) Rutherford's model
- C) Bohr's model
- D) Quantum model

✅ Correct Answer: C

Q27. The number of orbitals in the 'p' subshell is: (Q27)

- A) 1
- B) 2
- C) 3
- D) 6

✅ Correct Answer: C

Q28. The principal quantum number ‘n’ defines: (Q28)

- A) Shape of orbital
- B) Orientation of orbital
- C) Size and energy of orbital
- D) Spin of electron

✅ Correct Answer: C

Q29. What is the electronic configuration of Na (Z=11)? (Q29)

- A) 2,8,1
- B) 2,8,2
- C) 2,6,3
- D) 1,8,2

✅ Correct Answer: A

Q30. The total number of electrons that can be accommodated in a d-subshell is: (Q30)

- A) 2
- B) 6
- C) 10
- D) 14

✅ Correct Answer: C

Q31. The number of electrons in the outermost shell of an oxygen atom is: (Q31)

- A) 4
- B) 6
- C) 8

- D) 2

✅ Correct Answer: B

Q32. Which of the following particles has the smallest mass? (Q32)

- A) Proton
- B) Neutron
- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q33. The atomic number of an element is equal to: (Q33)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons
- D) Sum of protons and neutrons

✅ Correct Answer: A

Q34. The mass number of an atom is equal to: (Q34)

- A) Number of protons
- B) Number of neutrons
- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q35. Isotopes differ in: (Q35)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q36. The maximum number of electrons that can be accommodated in the L-shell is: (Q36)

- A) 2
- B) 8
- C) 18
- D) 32

✅ Correct Answer: B

Q37. Which of the following is not a fundamental particle of an atom? (Q37)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q38. Who discovered the electron? (Q38)

- A) Rutherford
- B) Bohr
- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q39. The charge on a neutron is: (Q39)

- A) Positive
- B) Negative
- C) Zero
- D) Depends on the isotope

✅ Correct Answer: C

Q40. The nucleus of an atom contains: (Q40)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Q41. Which model explained the existence of energy levels in an atom? (Q41)

- A) Thomson's model
- B) Rutherford's model
- C) Bohr's model
- D) Quantum model

✅ Correct Answer: C

Q42. The number of orbitals in the 'p' subshell is: (Q42)

- A) 1
- B) 2
- C) 3
- D) 6

✅ Correct Answer: C

Q43. The principal quantum number 'n' defines: (Q43)

- A) Shape of orbital
- B) Orientation of orbital
- C) Size and energy of orbital
- D) Spin of electron

✅ Correct Answer: C

Q44. What is the electronic configuration of Na (Z=11)? (Q44)

- A) 2,8,1
- B) 2,8,2
- C) 2,6,3

- D) 1,8,2

✅ Correct Answer: A

Q45. The total number of electrons that can be accommodated in a d-subshell is: (Q45)

- A) 2
- B) 6
- C) 10
- D) 14

✅ Correct Answer: C

Q46. The number of electrons in the outermost shell of an oxygen atom is: (Q46)

- A) 4
- B) 6
- C) 8
- D) 2

✅ Correct Answer: B

Q47. Which of the following particles has the smallest mass? (Q47)

- A) Proton
- B) Neutron
- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q48. The atomic number of an element is equal to: (Q48)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons
- D) Sum of protons and neutrons

✅ Correct Answer: A

Q49. The mass number of an atom is equal to: (Q49)

- A) Number of protons
- B) Number of neutrons
- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q50. Isotopes differ in: (Q50)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q51. The maximum number of electrons that can be accommodated in the L-shell is: (Q51)

- A) 2
- B) 8
- C) 18
- D) 32

✅ Correct Answer: B

Q52. Which of the following is not a fundamental particle of an atom? (Q52)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q53. Who discovered the electron? (Q53)

- A) Rutherford
- B) Bohr

- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q54. The charge on a neutron is: (Q54)

- A) Positive
- B) Negative
- C) Zero
- D) Depends on the isotope

✅ Correct Answer: C

Q55. The nucleus of an atom contains: (Q55)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Q56. Which model explained the existence of energy levels in an atom? (Q56)

- A) Thomson's model
- B) Rutherford's model
- C) Bohr's model
- D) Quantum model

✅ Correct Answer: C

Q57. The number of orbitals in the 'p' subshell is: (Q57)

- A) 1
- B) 2
- C) 3
- D) 6

✅ Correct Answer: C

Q58. The principal quantum number ‘n’ defines: (Q58)

- A) Shape of orbital
- B) Orientation of orbital
- C) Size and energy of orbital
- D) Spin of electron

✅ Correct Answer: C

Q59. What is the electronic configuration of Na (Z=11)? (Q59)

- A) 2,8,1
- B) 2,8,2
- C) 2,6,3
- D) 1,8,2

✅ Correct Answer: A

Q60. The total number of electrons that can be accommodated in a d-subshell is: (Q60)

- A) 2
- B) 6
- C) 10
- D) 14

✅ Correct Answer: C

Q61. The number of electrons in the outermost shell of an oxygen atom is: (Q61)

- A) 4
- B) 6
- C) 8
- D) 2

✅ Correct Answer: B

Q62. Which of the following particles has the smallest mass? (Q62)

- A) Proton
- B) Neutron
- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q63. The atomic number of an element is equal to: (Q63)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons
- D) Sum of protons and neutrons

✅ Correct Answer: A

Q64. The mass number of an atom is equal to: (Q64)

- A) Number of protons
- B) Number of neutrons
- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q65. Isotopes differ in: (Q65)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q66. The maximum number of electrons that can be accommodated in the L-shell is: (Q66)

- A) 2
- B) 8

- C) 18
- D) 32

✅ Correct Answer: B

Q67. Which of the following is not a fundamental particle of an atom? (Q67)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q68. Who discovered the electron? (Q68)

- A) Rutherford
- B) Bohr
- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q69. The charge on a neutron is: (Q69)

- A) Positive
- B) Negative
- C) Zero
- D) Depends on the isotope

✅ Correct Answer: C

Q70. The nucleus of an atom contains: (Q70)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Q71. Which model explained the existence of energy levels in an atom? (Q71)

- A) Thomson's model
- B) Rutherford's model
- C) Bohr's model
- D) Quantum model

✅ Correct Answer: C

Q72. The number of orbitals in the 'p' subshell is: (Q72)

- A) 1
- B) 2
- C) 3
- D) 6

✅ Correct Answer: C

Q73. The principal quantum number 'n' defines: (Q73)

- A) Shape of orbital
- B) Orientation of orbital
- C) Size and energy of orbital
- D) Spin of electron

✅ Correct Answer: C

Q74. What is the electronic configuration of Na (Z=11)? (Q74)

- A) 2,8,1
- B) 2,8,2
- C) 2,6,3
- D) 1,8,2

✅ Correct Answer: A

Q75. The total number of electrons that can be accommodated in a d-subshell is: (Q75)

- A) 2
- B) 6
- C) 10
- D) 14

✅ Correct Answer: C

Q76. The number of electrons in the outermost shell of an oxygen atom is: (Q76)

- A) 4
- B) 6
- C) 8
- D) 2

✅ Correct Answer: B

Q77. Which of the following particles has the smallest mass? (Q77)

- A) Proton
- B) Neutron
- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q78. The atomic number of an element is equal to: (Q78)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons
- D) Sum of protons and neutrons

✅ Correct Answer: A

Q79. The mass number of an atom is equal to: (Q79)

- A) Number of protons
- B) Number of neutrons

- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q80. Isotopes differ in: (Q80)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q81. The maximum number of electrons that can be accommodated in the L-shell is: (Q81)

- A) 2
- B) 8
- C) 18
- D) 32

✅ Correct Answer: B

Q82. Which of the following is not a fundamental particle of an atom? (Q82)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q83. Who discovered the electron? (Q83)

- A) Rutherford
- B) Bohr
- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q84. The charge on a neutron is: (Q84)

- A) Positive
- B) Negative
- C) Zero
- D) Depends on the isotope

✅ Correct Answer: C

Q85. The nucleus of an atom contains: (Q85)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Q86. Which model explained the existence of energy levels in an atom? (Q86)

- A) Thomson's model
- B) Rutherford's model
- C) Bohr's model
- D) Quantum model

✅ Correct Answer: C

Q87. The number of orbitals in the 'p' subshell is: (Q87)

- A) 1
- B) 2
- C) 3
- D) 6

✅ Correct Answer: C

Q88. The principal quantum number ‘n’ defines: (Q88)

- A) Shape of orbital
- B) Orientation of orbital
- C) Size and energy of orbital
- D) Spin of electron

✅ Correct Answer: C

Q89. What is the electronic configuration of Na (Z=11)? (Q89)

- A) 2,8,1
- B) 2,8,2
- C) 2,6,3
- D) 1,8,2

✅ Correct Answer: A

Q90. The total number of electrons that can be accommodated in a d-subshell is: (Q90)

- A) 2
- B) 6
- C) 10
- D) 14

✅ Correct Answer: C

Q91. The number of electrons in the outermost shell of an oxygen atom is: (Q91)

- A) 4
- B) 6
- C) 8
- D) 2

✅ Correct Answer: B

Q92. Which of the following particles has the smallest mass? (Q92)

- A) Proton
- B) Neutron

- C) Electron
- D) Alpha particle

✅ Correct Answer: C

Q93. The atomic number of an element is equal to: (Q93)

- A) Number of protons
- B) Number of electrons
- C) Number of neutrons
- D) Sum of protons and neutrons

✅ Correct Answer: A

Q94. The mass number of an atom is equal to: (Q94)

- A) Number of protons
- B) Number of neutrons
- C) Number of electrons
- D) Sum of protons and neutrons

✅ Correct Answer: D

Q95. Isotopes differ in: (Q95)

- A) Number of protons
- B) Number of neutrons
- C) Atomic number
- D) Electronic configuration

✅ Correct Answer: B

Q96. The maximum number of electrons that can be accommodated in the L-shell is: (Q96)

- A) 2
- B) 8
- C) 18
- D) 32

✅ Correct Answer: B

Q97. Which of the following is not a fundamental particle of an atom? (Q97)

- A) Proton
- B) Neutron
- C) Electron
- D) Positron

✅ Correct Answer: D

Q98. Who discovered the electron? (Q98)

- A) Rutherford
- B) Bohr
- C) J.J. Thomson
- D) Chadwick

✅ Correct Answer: C

Q99. The charge on a neutron is: (Q99)

- A) Positive
- B) Negative
- C) Zero
- D) Depends on the isotope

✅ Correct Answer: C

Q100. The nucleus of an atom contains: (Q100)

- A) Protons and neutrons
- B) Only protons
- C) Only electrons
- D) Protons and electrons

✅ Correct Answer: A

Chapter 2: Chemical Bonding

Q1. What type of bond is formed between two non-metal atoms? (Q1)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q2. Which of the following compounds has an ionic bond? (Q2)

- A) HCl
- B) CH_4
- C) NaCl
- D) H_2O

✅ Correct Answer: C

Q3. In which type of bond are electrons shared equally? (Q3)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q4. Which of the following species is an example of a coordinate covalent bond? (Q4)

- A) O_2
- B) NH_3
- C) H_2O

- D) NH_4^+

✅ Correct Answer: D

Q5. The bond formed by sharing two pairs of electrons is: (Q5)

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

✅ Correct Answer: B

Q6. What is the bond angle in a water molecule? (Q6)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q7. Which of the following has a linear geometry? (Q7)

- A) H_2O
- B) CO_2
- C) NH_3
- D) CH_4

✅ Correct Answer: B

Q8. The electronegativity difference required for a bond to be considered ionic is: (Q8)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q9. Which molecule has a trigonal planar geometry? (Q9)

- A) BF_3
- B) NH_3
- C) H_2O
- D) CO_2

✅ Correct Answer: A

Q10. Which of the following has a tetrahedral geometry? (Q10)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Q11. What type of bond is formed between two non-metal atoms? (Q11)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q12. Which of the following compounds has an ionic bond? (Q12)

- A) HCl
- B) CH_4
- C) NaCl
- D) H_2O

✅ Correct Answer: C

Q13. In which type of bond are electrons shared equally? (Q13)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q14. Which of the following species is an example of a coordinate covalent bond? (Q14)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q15. The bond formed by sharing two pairs of electrons is: (Q15)

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

✅ Correct Answer: B

Q16. What is the bond angle in a water molecule? (Q16)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q17. Which of the following has a linear geometry? (Q17)

- A) H2O
- B) CO2
- C) NH3

- D) CH_4

✅ Correct Answer: B

Q18. The electronegativity difference required for a bond to be considered ionic is: (Q18)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q19. Which molecule has a trigonal planar geometry? (Q19)

- A) BF_3
- B) NH_3
- C) H_2O
- D) CO_2

✅ Correct Answer: A

Q20. Which of the following has a tetrahedral geometry? (Q20)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Q21. What type of bond is formed between two non-metal atoms? (Q21)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q22. Which of the following compounds has an ionic bond? (Q22)

- A) HCl
- B) CH_4
- C) NaCl
- D) H_2O

✅ Correct Answer: C

Q23. In which type of bond are electrons shared equally? (Q23)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q24. Which of the following species is an example of a coordinate covalent bond? (Q24)

- A) O_2
- B) NH_3
- C) H_2O
- D) NH_4^+

✅ Correct Answer: D

Q25. The bond formed by sharing two pairs of electrons is: (Q25)

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

✅ Correct Answer: B

Q26. What is the bond angle in a water molecule? (Q26)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q27. Which of the following has a linear geometry? (Q27)

- A) H2O
- B) CO2
- C) NH3
- D) CH4

✅ Correct Answer: B

Q28. The electronegativity difference required for a bond to be considered ionic is: (Q28)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q29. Which molecule has a trigonal planar geometry? (Q29)

- A) BF3
- B) NH3
- C) H2O
- D) CO2

✅ Correct Answer: A

Q30. Which of the following has a tetrahedral geometry? (Q30)

- A) CH4
- B) CO2
- C) H2O

- D) NH3

✅ Correct Answer: A

Q31. What type of bond is formed between two non-metal atoms? (Q31)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q32. Which of the following compounds has an ionic bond? (Q32)

- A) HCl
- B) CH4
- C) NaCl
- D) H2O

✅ Correct Answer: C

Q33. In which type of bond are electrons shared equally? (Q33)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q34. Which of the following species is an example of a coordinate covalent bond? (Q34)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q35. The bond formed by sharing two pairs of electrons is: (Q35)

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

✅ Correct Answer: B

Q36. What is the bond angle in a water molecule? (Q36)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q37. Which of the following has a linear geometry? (Q37)

- A) H_2O
- B) CO_2
- C) NH_3
- D) CH_4

✅ Correct Answer: B

Q38. The electronegativity difference required for a bond to be considered ionic is: (Q38)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q39. Which molecule has a trigonal planar geometry? (Q39)

- A) BF_3
- B) NH_3
- C) H_2O
- D) CO_2

✅ Correct Answer: A

Q40. Which of the following has a tetrahedral geometry? (Q40)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Q41. What type of bond is formed between two non-metal atoms? (Q41)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q42. Which of the following compounds has an ionic bond? (Q42)

- A) HCl
- B) CH_4
- C) NaCl
- D) H_2O

✅ Correct Answer: C

Q43. In which type of bond are electrons shared equally? (Q43)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond

- D) Metallic bond

✅ Correct Answer: B

Q44. Which of the following species is an example of a coordinate covalent bond? (Q44)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q45. The bond formed by sharing two pairs of electrons is: (Q45)

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

✅ Correct Answer: B

Q46. What is the bond angle in a water molecule? (Q46)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q47. Which of the following has a linear geometry? (Q47)

- A) H2O
- B) CO2
- C) NH3
- D) CH4

✅ Correct Answer: B

Q48. The electronegativity difference required for a bond to be considered ionic is: (Q48)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q49. Which molecule has a trigonal planar geometry? (Q49)

- A) BF3
- B) NH3
- C) H2O
- D) CO2

✅ Correct Answer: A

Q50. Which of the following has a tetrahedral geometry? (Q50)

- A) CH4
- B) CO2
- C) H2O
- D) NH3

✅ Correct Answer: A

Q51. What type of bond is formed between two non-metal atoms? (Q51)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q52. Which of the following compounds has an ionic bond? (Q52)

- A) HCl
- B) CH4
- C) NaCl
- D) H2O

✅ Correct Answer: C

Q53. In which type of bond are electrons shared equally? (Q53)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q54. Which of the following species is an example of a coordinate covalent bond? (Q54)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q55. The bond formed by sharing two pairs of electrons is: (Q55)

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

✅ Correct Answer: B

Q56. What is the bond angle in a water molecule? (Q56)

- A) 90°
- B) 104.5°
- C) 120°

- D) 180°

✅ Correct Answer: B

Q57. Which of the following has a linear geometry? (Q57)

- A) H2O
- B) CO2
- C) NH3
- D) CH4

✅ Correct Answer: B

Q58. The electronegativity difference required for a bond to be considered ionic is: (Q58)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q59. Which molecule has a trigonal planar geometry? (Q59)

- A) BF3
- B) NH3
- C) H2O
- D) CO2

✅ Correct Answer: A

Q60. Which of the following has a tetrahedral geometry? (Q60)

- A) CH4
- B) CO2
- C) H2O
- D) NH3

✅ Correct Answer: A

Q61. What type of bond is formed between two non-metal atoms? (Q61)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q62. Which of the following compounds has an ionic bond? (Q62)

- A) HCl
- B) CH_4
- C) NaCl
- D) H_2O

✅ Correct Answer: C

Q63. In which type of bond are electrons shared equally? (Q63)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q64. Which of the following species is an example of a coordinate covalent bond? (Q64)

- A) O_2
- B) NH_3
- C) H_2O
- D) NH_4^+

✅ Correct Answer: D

Q65. The bond formed by sharing two pairs of electrons is: (Q65)

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

✅ Correct Answer: B

Q66. What is the bond angle in a water molecule? (Q66)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q67. Which of the following has a linear geometry? (Q67)

- A) H2O
- B) CO2
- C) NH3
- D) CH4

✅ Correct Answer: B

Q68. The electronegativity difference required for a bond to be considered ionic is: (Q68)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q69. Which molecule has a trigonal planar geometry? (Q69)

- A) BF3
- B) NH3
- C) H2O

- D) CO_2

✅ Correct Answer: A

Q70. Which of the following has a tetrahedral geometry? (Q70)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Q71. What type of bond is formed between two non-metal atoms? (Q71)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q72. Which of the following compounds has an ionic bond? (Q72)

- A) HCl
- B) CH_4
- C) NaCl
- D) H_2O

✅ Correct Answer: C

Q73. In which type of bond are electrons shared equally? (Q73)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q74. Which of the following species is an example of a coordinate covalent bond? (Q74)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q75. The bond formed by sharing two pairs of electrons is: (Q75)

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

✅ Correct Answer: B

Q76. What is the bond angle in a water molecule? (Q76)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q77. Which of the following has a linear geometry? (Q77)

- A) H2O
- B) CO2
- C) NH3
- D) CH4

✅ Correct Answer: B

Q78. The electronegativity difference required for a bond to be considered ionic is: (Q78)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q79. Which molecule has a trigonal planar geometry? (Q79)

- A) BF_3
- B) NH_3
- C) H_2O
- D) CO_2

✅ Correct Answer: A

Q80. Which of the following has a tetrahedral geometry? (Q80)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Q81. What type of bond is formed between two non-metal atoms? (Q81)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q82. Which of the following compounds has an ionic bond? (Q82)

- A) HCl
- B) CH_4
- C) NaCl

- D) H2O

✅ Correct Answer: C

Q83. In which type of bond are electrons shared equally? (Q83)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q84. Which of the following species is an example of a coordinate covalent bond? (Q84)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q85. The bond formed by sharing two pairs of electrons is: (Q85)

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

✅ Correct Answer: B

Q86. What is the bond angle in a water molecule? (Q86)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q87. Which of the following has a linear geometry? (Q87)

- A) H_2O
- B) CO_2
- C) NH_3
- D) CH_4

✅ Correct Answer: B

Q88. The electronegativity difference required for a bond to be considered ionic is: (Q88)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q89. Which molecule has a trigonal planar geometry? (Q89)

- A) BF_3
- B) NH_3
- C) H_2O
- D) CO_2

✅ Correct Answer: A

Q90. Which of the following has a tetrahedral geometry? (Q90)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Q91. What type of bond is formed between two non-metal atoms? (Q91)

- A) Ionic bond
- B) Covalent bond
- C) Metallic bond
- D) Coordinate bond

✅ Correct Answer: B

Q92. Which of the following compounds has an ionic bond? (Q92)

- A) HCl
- B) CH4
- C) NaCl
- D) H2O

✅ Correct Answer: C

Q93. In which type of bond are electrons shared equally? (Q93)

- A) Polar covalent bond
- B) Non-polar covalent bond
- C) Ionic bond
- D) Metallic bond

✅ Correct Answer: B

Q94. Which of the following species is an example of a coordinate covalent bond? (Q94)

- A) O2
- B) NH3
- C) H2O
- D) NH4+

✅ Correct Answer: D

Q95. The bond formed by sharing two pairs of electrons is: (Q95)

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

- D) Ionic bond

✅ Correct Answer: B

Q96. What is the bond angle in a water molecule? (Q96)

- A) 90°
- B) 104.5°
- C) 120°
- D) 180°

✅ Correct Answer: B

Q97. Which of the following has a linear geometry? (Q97)

- A) H_2O
- B) CO_2
- C) NH_3
- D) CH_4

✅ Correct Answer: B

Q98. The electronegativity difference required for a bond to be considered ionic is: (Q98)

- A) < 0.4
- B) 0.4 – 1.7
- C) > 1.7
- D) 0.1 – 0.3

✅ Correct Answer: C

Q99. Which molecule has a trigonal planar geometry? (Q99)

- A) BF_3
- B) NH_3
- C) H_2O
- D) CO_2

✅ Correct Answer: A

Q100. Which of the following has a tetrahedral geometry? (Q100)

- A) CH_4
- B) CO_2
- C) H_2O
- D) NH_3

✅ Correct Answer: A

Chapter 3: Solutions

1. **Q1.** What is a solution?
   A) A pure substance
   B) A heterogeneous mixture
   C) A homogeneous mixture
   D) An element
   ✅ Correct Answer: C
2. **Q2.** Which of the following is an example of a solid solution?
   A) Salt in water
   B) Air
   C) Brass
   D) Vinegar
   ✅ Correct Answer: C
3. **Q3.** The component present in a larger amount in a solution is called:
   A) Solute
   B) Solvent
   C) Colloid
   D) Emulsion
   ✅ Correct Answer: B
4. **Q4.** Which of the following is *not* a characteristic of a true solution?
   A) Homogeneous
   B) Transparent
   C) Solute particles visible
   D) Stable
   ✅ Correct Answer: C
5. **Q5.** Which law relates the solubility of a gas in liquid to pressure?
   A) Boyle's Law
   B) Charles's Law
   C) Henry's Law
   D) Raoult's Law
   ✅ Correct Answer: C
6. **Q6.** What is the unit of molarity?
   A) mol/L
   B) g/L
   C) mol/kg

D) L/mol

✅ Correct Answer: A

7. **Q7.** Which factor does NOT affect the solubility of a solid in a liquid?
   A) Temperature
   B) Nature of solute and solvent
   C) Pressure
   D) Stirring
   ✅ Correct Answer: C
8. **Q8.** A saturated solution is one which:
   A) Can dissolve more solute
   B) Contains undissolved solute
   C) Cannot dissolve any more solute
   D) Is very dilute
   ✅ Correct Answer: C
9. **Q9.** What happens to the solubility of gases in liquids with increase in temperature?
   A) Increases
   B) Decreases
   C) Remains same
   D) Doubles
   ✅ Correct Answer: B
10. **Q10.** The process of separating the components of a solution is called:
    A) Filtration
    B) Crystallization
    C) Distillation
    D) Decantation
    ✅ Correct Answer: C
11. **Q11.** The concentration of a solution is defined as:
    A) The amount of solute in 1 mole of solvent
    B) The amount of solvent in 1 mole of solute
    C) The amount of solute in a given amount of solvent or solution
    D) The mass of solvent only
    ✅ Correct Answer: C
12. **Q12.** Which term describes a solution that contains less solute than it can hold at a given temperature?
    A) Saturated
    B) Supersaturated
    C) Dilute
    D) Unsaturated
    ✅ Correct Answer: D
13. **Q13.** Solubility increases with temperature in:
    A) Gases in liquids
    B) Liquids in solids

C) Solids in liquids
D) Gases in solids
✅ Correct Answer: C

14. **Q14.** What is the formula of molality (m)?
A) moles of solute / liters of solution
B) grams of solute / liters of solution
C) moles of solute / kg of solvent
D) moles of solvent / kg of solute
✅ Correct Answer: C

15. **Q15.** Which is not a colligative property?
A) Boiling point elevation
B) Freezing point depression
C) Osmotic pressure
D) Density
✅ Correct Answer: D

16. **Q16.** A solution that conducts electricity is called:
A) Non-electrolyte
B) Electrolyte
C) Insoluble
D) Pure solvent
✅ Correct Answer: B

17. **Q17.** The term "miscible" refers to:
A) Liquids that dissolve in water
B) Liquids that dissolve in each other
C) Solids that do not dissolve
D) Gases in solids
✅ Correct Answer: B

18. **Q18.** Which of the following solutions has the highest concentration?
A) 1 mol in 1 L
B) 1 mol in 2 L
C) 2 mol in 2 L
D) 0.5 mol in 1 L
✅ Correct Answer: A

19. **Q19.** Which instrument is used to measure concentration by optical methods?
A) Thermometer
B) Refractometer
C) Barometer
D) Hygrometer
✅ Correct Answer: B

20. **Q20.** Which statement is true about solutions?
A) They scatter light
B) They are always colorless

C) They have uniform composition
D) Particles settle on standing
✅ Correct Answer: C

21. **Q21.** What is the nature of the solution when more solute can be dissolved at the given temperature?
A) Saturated
B) Unsaturated
C) Supersaturated
D) Concentrated
✅ Correct Answer: B

22. **Q22.** A solution made by dissolving 10g of NaCl in 100g of water is:
A) Saturated
B) Unsaturated
C) Dilute
D) Concentrated
✅ Correct Answer: C

23. **Q23.** What type of solution is formed when alcohol is mixed with water?
A) Solid-solid
B) Solid-liquid
C) Liquid-liquid
D) Gas-liquid
✅ Correct Answer: C

24. **Q24.** Raoult's law is applicable to:
A) Colloids
B) True solutions
C) Suspensions
D) Emulsions
✅ Correct Answer: B

25. **Q25.** Which of the following expresses the number of moles of solute per liter of solution?
A) Molality
B) Molarity
C) Normality
D) Mole fraction
✅ Correct Answer: B

26. **Q26.** Which expression denotes mole fraction (χ)?
A) Moles of solute / mass of solvent
B) Moles of solute / volume of solution
C) Moles of solute / total moles of all components
D) Mass of solute / total volume
✅ Correct Answer: C

27. **Q27.** Solubility of solids in liquids generally:
    A) Increases with increase in pressure
    B) Decreases with increase in pressure
    C) Is independent of pressure
    D) Is affected only by temperature
    ✅ Correct Answer: C
28. **Q28.** Which term refers to the heat absorbed or released during dissolution?
    A) Latent heat
    B) Heat of hydration
    C) Enthalpy of solution
    D) Heat capacity
    ✅ Correct Answer: C
29. **Q29.** A solute that does not conduct electricity when dissolved is called:
    A) Electrolyte
    B) Conductor
    C) Non-electrolyte
    D) None of these
    ✅ Correct Answer: C
30. **Q30.** Which of the following is a strong electrolyte?
    A) Glucose
    B) Urea
    C) NaOH
    D) CH3COOH
    ✅ Correct Answer: C
31. **Q31.** Which term represents the amount of solute that can be dissolved in 100g of solvent at a specific temperature?
    A) Solubility
    B) Molarity
    C) Density
    D) Saturation point
    ✅ Correct Answer: A
32. **Q32.** What will happen if more solute is added to a saturated solution?
    A) It dissolves completely
    B) It increases solubility
    C) It remains undissolved
    D) It forms a new solution
    ✅ Correct Answer: C
33. **Q33.** A dilute solution has:
    A) More solute
    B) Equal solute and solvent
    C) Less solute

D) No solute

✅ Correct Answer: C

34. **Q34.** A solution of sugar in water is a:
    A) Non-electrolyte solution
    B) Electrolyte solution
    C) Colloidal solution
    D) Suspension
    ✅ Correct Answer: A
35. **Q35.** The boiling point of a solution is:
    A) Lower than that of the pure solvent
    B) Same as that of the solvent
    C) Higher than that of the pure solvent
    D) Unaffected by solute
    ✅ Correct Answer: C
36. **Q36.** Which factor increases the rate of dissolving a solid in a liquid?
    A) Decreasing temperature
    B) Stirring
    C) Decreasing surface area
    D) Freezing
    ✅ Correct Answer: B
37. **Q37.** Which of the following increases when a non-volatile solute is added to a solvent?
    A) Freezing point
    B) Vapour pressure
    C) Boiling point
    D) Temperature
    ✅ Correct Answer: C
38. **Q38.** When a solution contains more solute than it can theoretically hold at a given temperature, it is:
    A) Saturated
    B) Supersaturated
    C) Unsaturated
    D) Dilute
    ✅ Correct Answer: B
39. **Q39.** A characteristic of an ideal solution is:
    A) Shows positive deviation from Raoult's Law
    B) Shows negative deviation
    C) Obeys Raoult's Law at all concentrations
    D) Contains electrolytes only
    ✅ Correct Answer: C
40. **Q40.** What type of mixture is a solution?
    A) Homogeneous
    B) Heterogeneous

C) Semi-solid
D) Colloidal
✅ Correct Answer: A

41. **Q41.** What is the term for a solution with high solute concentration?
A) Dilute
B) Concentrated
C) Saturated
D) Unsaturated
✅ Correct Answer: B

42. **Q42.** The addition of a solute to a solvent results in:
A) Increase in vapour pressure
B) Decrease in boiling point
C) Increase in freezing point
D) Decrease in vapour pressure
✅ Correct Answer: D

43. **Q43.** Which factor does NOT affect the boiling point of a solution?
A) Nature of solute
B) Concentration
C) Pressure
D) Color of solution
✅ Correct Answer: D

44. **Q44.** A solution that contains a small amount of solute is called:
A) Concentrated
B) Saturated
C) Dilute
D) Supersaturated
✅ Correct Answer: C

45. **Q45.** The freezing point of a solution compared to pure solvent is:
A) Higher
B) Lower
C) Same
D) Doubled
✅ Correct Answer: B

46. **Q46.** Which of the following solutions is ideal?
A) HCl + H_2O
B) Ethanol + Water
C) Benzene + Toluene
D) Acetic acid + Water
✅ Correct Answer: C

47. **Q47.** What happens to the vapor pressure of a solvent when a non-volatile solute is added?
A) Increases

B) Decreases
C) Remains the same
D) First increases then decreases
✅ Correct Answer: B

48. **Q48.** Which unit is used for expressing concentration in titration problems?
A) Normality
B) Molarity
C) Molality
D) Mole fraction
✅ Correct Answer: A

49. **Q49.** How many components are present in a binary solution?
A) 1
B) 2
C) 3
D) 4
✅ Correct Answer: B

50. **Q50.** A solution of KCl in water is classified as:
A) Non-electrolyte
B) Weak electrolyte
C) Strong electrolyte
D) Colloid
✅ Correct Answer: C

51. **Q51.** In a solution, the solute is the substance that is:
A) In larger amount
B) In gaseous form
C) In solid form only
D) Dissolved in solvent
✅ Correct Answer: D

52. **Q52.** The solvent in an aqueous solution is always:
A) Salt
B) Water
C) Acid
D) Base
✅ Correct Answer: B

53. **Q53.** The term "hydration" refers to:
A) Reaction with alcohol
B) Reaction with oxygen
C) Combination with water
D) Combination with acid
✅ Correct Answer: C

54. **Q54.** Which of the following is most likely to increase solubility of a solid solute in water?

A) Decreasing temperature
B) Increasing temperature
C) Adding more solute
D) Increasing pressure
✅ Correct Answer: B

55. **Q55.** A solution that contains ions and conducts electricity is called:
A) A weak acid
B) A colloid
C) An electrolyte
D) A base
✅ Correct Answer: C

56. **Q56.** Molarity is affected by:
A) Volume changes with temperature
B) Mass of solvent only
C) Weight of solute
D) Nature of container
✅ Correct Answer: A

57. **Q57.** What happens to a supersaturated solution when disturbed?
A) Becomes saturated
B) Crystallizes
C) Becomes unsaturated
D) Becomes dilute
✅ Correct Answer: B

58. **Q58.** Which solution will have the highest boiling point?
A) Pure water
B) 0.1 M NaCl
C) 0.2 M NaCl
D) 0.1 M sugar
✅ Correct Answer: C

59. **Q59.** When two liquids are immiscible, they:
A) Form a homogeneous mixture
B) Completely mix
C) Form two layers
D) Always react chemically
✅ Correct Answer: C

60. **Q60.** What is the number of grams of solute in 1 liter of 1M NaCl solution? (Na = 23, Cl = 35.5)
A) 58.5g
B) 60g
C) 23g
D) 35.5g
✅ Correct Answer: A

61. **Q61.** Which one of the following affects the solubility of gases in liquids?
    A) Temperature and pressure
    B) Only temperature
    C) Only volume
    D) Nature of solute only
    ✅ Correct Answer: A
62. **Q62.** Henry's Law is related to:
    A) Solubility of solids
    B) Solubility of gases
    C) Concentration of acids
    D) Boiling point elevation
    ✅ Correct Answer: B
63. **Q63.** Which one is NOT a unit of concentration?
    A) Molarity
    B) Molality
    C) Normality
    D) Elasticity
    ✅ Correct Answer: D
64. **Q64.** Which factor is directly proportional to boiling point elevation?
    A) Vapour pressure
    B) Molality
    C) Volume
    D) Temperature
    ✅ Correct Answer: B
65. **Q65.** In colligative properties, the effect depends on:
    A) Nature of solute
    B) Molecular weight of solvent
    C) Number of solute particles
    D) Volume of solvent only
    ✅ Correct Answer: C
66. **Q66.** The term "colligative" means:
    A) Heat absorbing
    B) Depends on type of solute
    C) Depends on solute concentration
    D) Depends on volume only
    ✅ Correct Answer: C
67. **Q67.** Which of the following has the maximum freezing point depression?
    A) 0.1 M glucose
    B) 0.1 M NaCl
    C) 0.1 M KCl
    D) 0.1 M $CaCl_2$
    ✅ Correct Answer: D

68. **Q68.** What is the freezing point of pure water?
    A) 100°C
    B) 25°C
    C) 4°C
    D) 0°C
    ✅ Correct Answer: D
69. **Q69.** A concentrated solution can be diluted by:
    A) Adding solute
    B) Evaporating solvent
    C) Adding more solvent
    D) Heating the solution
    ✅ Correct Answer: C
70. **Q70.** Which property increases by adding a solute to a pure solvent?
    A) Freezing point
    B) Vapour pressure
    C) Boiling point
    D) Conductivity (only for non-electrolyte)
    ✅ Correct Answer: C
71. **Q71.** Which of the following does NOT follow Raoult's Law?
    A) Benzene + Toluene
    B) Water + Ethanol
    C) Acetone + Chloroform
    D) Water + NaCl
    ✅ Correct Answer: D
72. **Q72.** Molality is independent of:
    A) Mass of solute
    B) Volume of solvent
    C) Temperature
    D) Mass of solvent
    ✅ Correct Answer: C
73. **Q73.** Boiling point elevation is a:
    A) Colligative property
    B) Chemical property
    C) Thermal property
    D) Physical constant
    ✅ Correct Answer: A
74. **Q74.** Which mixture is homogeneous?
    A) Milk
    B) Water + Alcohol
    C) Oil + Water
    D) Smoke
    ✅ Correct Answer: B

75. **Q75.** Which of the following is NOT a type of solution?
    A) Solid in liquid
    B) Gas in gas
    C) Liquid in solid
    D) Light in gas
    ✅ Correct Answer: D
76. **Q76.** A 1 molal solution means:
    A) 1 mole of solute in 1L solution
    B) 1 mole of solute in 100g solvent
    C) 1 mole of solute in 1kg solvent
    D) 1 mole of solute in 1g solvent
    ✅ Correct Answer: C
77. **Q77.** The solubility of a gas in a liquid decreases with:
    A) Increase in pressure
    B) Decrease in temperature
    C) Increase in temperature
    D) Use of catalysts
    ✅ Correct Answer: C
78. **Q78.** The addition of urea to water results in:
    A) Increase in freezing point
    B) Decrease in freezing point
    C) No change in freezing point
    D) Decrease in boiling point
    ✅ Correct Answer: B
79. **Q79.** Which property is not colligative?
    A) Boiling point elevation
    B) Freezing point depression
    C) Osmotic pressure
    D) Colour of solution
    ✅ Correct Answer: D
80. **Q80.** A solution that obeys Raoult's law is called:
    A) Non-ideal
    B) Colloidal
    C) Ideal
    D) Azeotropic
    ✅ Correct Answer: C
81. **Q81.** Which method is used to separate solute from solvent in a solution?
    A) Filtration
    B) Sedimentation
    C) Distillation
    D) Chromatography
    ✅ Correct Answer: C

82. **Q82.** When no more solute can dissolve in a solution at a given temperature, the solution is:
    A) Unsaturated
    B) Saturated
    C) Dilute
    D) Supersaturated
    ✅ Correct Answer: B
83. **Q83.** The process of solute particles spreading evenly in a solvent is called:
    A) Suspension
    B) Diffusion
    C) Condensation
    D) Fusion
    ✅ Correct Answer: B
84. **Q84.** Which solution would show the lowest freezing point?
    A) 1 M glucose
    B) 1 M NaCl
    C) 1 M $CaCl_2$
    D) Pure water
    ✅ Correct Answer: C
85. **Q85.** What is the term for the amount of solute dissolved per unit mass of solvent?
    A) Molality
    B) Molarity
    C) Normality
    D) Solubility
    ✅ Correct Answer: A
86. **Q86.** When two liquids mix in all proportions forming a single phase, they are:
    A) Immiscible
    B) Miscible
    C) Colloidal
    D) Saturated
    ✅ Correct Answer: B
87. **Q87.** Which of the following is an example of gas in liquid solution?
    A) Air
    B) Carbonated water
    C) Vinegar
    D) Saltwater
    ✅ Correct Answer: B
88. **Q88.** The main solvent in soft drinks is:
    A) Ethanol
    B) Water
    C) Carbon dioxide

D) Sugar

✅ Correct Answer: B

89. **Q89.** Which term represents the ratio of moles of solute to total moles of all components?
A) Molality
B) Mole fraction
C) Molarity
D) Normality
✅ Correct Answer: B
90. **Q90.** A solution that conducts electricity must contain:
A) Sugar
B) Electrolytes
C) Colloids
D) Organic compounds
✅ Correct Answer: B

Chapter 4: Acids and Bases

1. **Q1.** Acids have a pH value:
A) Equal to 7
B) Greater than 7
C) Less than 7
D) Zero
✅ Correct Answer: C
2. **Q2.** A base turns red litmus paper:
A) Red
B) Blue
C) Colorless
D) No change
✅ Correct Answer: B
3. **Q3.** Which of the following is a strong acid?
A) Acetic acid
B) Citric acid
C) Hydrochloric acid
D) Carbonic acid
✅ Correct Answer: C
4. **Q4.** Which of the following is a weak base?
A) NaOH
B) KOH
C) NH_4OH
D) $Ca(OH)_2$
✅ Correct Answer: C

5. **Q5.** pH of neutral solution is:
   A) 0
   B) 7
   C) 14
   D) 1
   ✅ Correct Answer: B
6. **Q6.** Which acid is present in lemon?
   A) Acetic acid
   B) Tartaric acid
   C) Citric acid
   D) Formic acid
   ✅ Correct Answer: C
7. **Q7.** Which of the following is NOT a characteristic of acids?
   A) Sour taste
   B) Turns blue litmus red
   C) Bitter taste
   D) Reacts with metals
   ✅ Correct Answer: C
8. **Q8.** Which one of these is an alkali?
   A) NaOH
   B) $Cu(OH)_2$
   C) $Zn(OH)_2$
   D) $Fe(OH)_3$
   ✅ Correct Answer: A
9. **Q9.** Which instrument is used to measure pH?
   A) Colorimeter
   B) Thermometer
   C) pH meter
   D) Conductivity meter
   ✅ Correct Answer: C
10. **Q10.** What does a pH of 2 indicate?
    A) Weak acid
    B) Strong acid
    C) Weak base
    D) Neutral solution
    ✅ Correct Answer: B
11. **Q11.** Which acid is found in vinegar?
    A) Formic acid
    B) Hydrochloric acid
    C) Acetic acid
    D) Oxalic acid
    ✅ Correct Answer: C

12. **Q12.** What is the product when an acid reacts with a base?
    A) Only water
    B) Salt and water
    C) Only salt
    D) Acidic solution
    ✅ Correct Answer: B
13. **Q13.** Which ion is produced by acids in aqueous solution?
    A) OH^-
    B) Cl^-
    C) H^+
    D) Na^+
    ✅ Correct Answer: C
14. **Q14.** Which base is used in antacids?
    A) NaOH
    B) $Mg(OH)_2$
    C) $Ca(OH)_2$
    D) $Fe(OH)_3$
    ✅ Correct Answer: B
15. **Q15.** A solution with pH = 9 is:
    A) Neutral
    B) Strongly acidic
    C) Weakly basic
    D) Strongly basic
    ✅ Correct Answer: C
16. **Q16.** Which substance is amphoteric?
    A) HCl
    B) NaOH
    C) H_2O
    D) H_2SO_4
    ✅ Correct Answer: C
17. **Q17.** Strong acids dissociate:
    A) Completely in water
    B) Partially in water
    C) Not in water
    D) Only in alcohol
    ✅ Correct Answer: A
18. **Q18.** Which is a Bronsted-Lowry acid?
    A) HCl
    B) NH_3
    C) OH^-
    D) NaCl
    ✅ Correct Answer: A

19. **Q19.** A base is a substance that:
    A) Donates protons
    B) Accepts protons
    C) Donates electrons
    D) Accepts neutrons
    ✅ Correct Answer: B
20. **Q20.** Neutralization is a reaction between:
    A) Acid and salt
    B) Base and salt
    C) Acid and base
    D) Salt and water
    ✅ Correct Answer: C
21. **Q21.** Which of the following is a property of bases?
    A) Sour taste
    B) Turns blue litmus red
    C) Slippery to touch
    D) Reacts with metals to release hydrogen
    ✅ Correct Answer: C
22. **Q22.** The pH of a 1 M NaOH solution is approximately:
    A) 1
    B) 7
    C) 13
    D) 3
    ✅ Correct Answer: C
23. **Q23.** Acids react with metals to form:
    A) Salt and water
    B) Salt and hydrogen gas
    C) Base and water
    D) Salt and oxygen
    ✅ Correct Answer: B
24. **Q24.** Which of the following is NOT a strong base?
    A) KOH
    B) NaOH
    C) NH_4OH
    D) $Ca(OH)_2$
    ✅ Correct Answer: C
25. **Q25.** What color does phenolphthalein turn in a basic solution?
    A) Red
    B) Pink
    C) Yellow
    D) Colorless
    ✅ Correct Answer: B

26. **Q26.** Which of these is a strong electrolyte?
    A) Glucose
    B) Urea
    C) HCl
    D) CH_3COOH
    ✅ Correct Answer: C
27. **Q27.** The formula for sulfuric acid is:
    A) HNO_3
    B) H_2SO_4
    C) HCl
    D) H_2CO_3
    ✅ Correct Answer: B
28. **Q28.** Which of the following will have the highest pH?
    A) 1 M HCl
    B) 0.1 M NaOH
    C) Pure water
    D) 1 M NaOH
    ✅ Correct Answer: D
29. **Q29.** Lime water contains:
    A) NaOH
    B) $Ca(OH)_2$
    C) KOH
    D) NH_4OH
    ✅ Correct Answer: B
30. **Q30.** Litmus turns **blue** in which solution?
    A) HCl
    B) Vinegar
    C) NaOH
    D) Lemon juice
    ✅ Correct Answer: C
31. **Q31.** Which compound acts as an acid and a base?
    A) NaOH
    B) NH_3
    C) H_2O
    D) HCl
    ✅ Correct Answer: C
32. **Q32.** What is formed when sulfuric acid reacts with sodium hydroxide?
    A) H_2O only
    B) NaCl
    C) Na_2SO_4 and H_2O
    D) Na_2CO_3
    ✅ Correct Answer: C

33. **Q33.** Which of the following is NOT used to determine pH?
    A) Litmus paper
    B) pH meter
    C) Universal indicator
    D) Thermometer
    ✅ Correct Answer: D
34. **Q34.** In acidic solutions, concentration of H^+ ions is:
    A) Low
    B) Zero
    C) High
    D) None
    ✅ Correct Answer: C
35. **Q35.** Baking soda is:
    A) Acidic
    B) Basic
    C) Neutral
    D) Amphoteric
    ✅ Correct Answer: B
36. **Q36.** The pH scale ranges from:
    A) 1 to 10
    B) 0 to 7
    C) 0 to 14
    D) 1 to 100
    ✅ Correct Answer: C
37. **Q37.** Which base is commonly used in soaps?
    A) KOH
    B) $Ca(OH)_2$
    C) $Mg(OH)_2$
    D) NaOH
    ✅ Correct Answer: D
38. **Q38.** Toothpaste is generally:
    A) Acidic
    B) Basic
    C) Neutral
    D) Salt
    ✅ Correct Answer: B
39. **Q39.** Which acid is present in the stomach?
    A) Acetic acid
    B) Hydrochloric acid
    C) Sulfuric acid
    D) Nitric acid
    ✅ Correct Answer: B

40. **Q40.** Which of the following is neutral?
    A) Water
    B) NaOH
    C) HCl
    D) NH_4OH
    ✅ Correct Answer: A
41. **Q41.** What is the pH of a 0.01 M HCl solution?
    A) 1
    B) 2
    C) 12
    D) 10
    ✅ Correct Answer: B
42. **Q42.** Which acid is used in car batteries?
    A) Hydrochloric acid
    B) Sulfuric acid
    C) Nitric acid
    D) Acetic acid
    ✅ Correct Answer: B
43. **Q43.** The conjugate base of H_2SO_4 is:
    A) SO_4^{2-}
    B) HSO_4^-
    C) H^+
    D) OH^-
    ✅ Correct Answer: B
44. **Q44.** An acid is a substance that increases the concentration of which ion in aqueous solution?
    A) OH^-
    B) Cl^-
    C) H^+
    D) Na^+
    ✅ Correct Answer: C
45. **Q45.** Which of the following is NOT a Bronsted-Lowry base?
    A) NH_3
    B) OH^-
    C) H_2O
    D) HCl
    ✅ Correct Answer: D
46. **Q46.** A solution with pH = 7 is:
    A) Strong acid
    B) Weak base
    C) Neutral

D) Strong base

✅ Correct Answer: C

47. **Q47.** A solution of pH 5 is how many times more acidic than a solution of pH 6?
    A) 1
    B) 5
    C) 10
    D) 100
    ✅ Correct Answer: C
48. **Q48.** What happens to the pH when a strong base is added to water?
    A) Increases
    B) Decreases
    C) Remains the same
    D) Becomes neutral
    ✅ Correct Answer: A
49. **Q49.** A base that ionizes completely in water is called:
    A) Weak base
    B) Strong base
    C) Neutral
    D) None of the above
    ✅ Correct Answer: B
50. **Q50.** Which among the following is NOT a mineral acid?
    A) HCl
    B) H_2SO_4
    C) HNO_3
    D) CH_3COOH
    ✅ Correct Answer: D
51. **Q51.** Which acid is used to clean toilets?
    A) Sulfuric acid
    B) Hydrochloric acid
    C) Acetic acid
    D) Formic acid
    ✅ Correct Answer: B
52. **Q52.** A Bronsted-Lowry base:
    A) Donates H^+
    B) Accepts H^+
    C) Donates OH^-
    D) Accepts OH^-
    ✅ Correct Answer: B
53. **Q53.** The acid found in ant stings is:
    A) Acetic acid
    B) Formic acid
    C) Citric acid

D) Tartaric acid

✅ Correct Answer: B

54. **Q54.** The pH of a basic solution is always:
    A) <7
    B) =7
    C) >7
    D) =0
    ✅ Correct Answer: C
55. **Q55.** The sour taste of acids is due to:
    A) Na^+ ions
    B) OH^- ions
    C) H^+ ions
    D) Cl^- ions
    ✅ Correct Answer: C
56. **Q56.** What happens in neutralization reaction?
    A) Acid + Acid → Salt
    B) Base + Base → Water
    C) Acid + Base → Salt + Water
    D) Salt + Water → Acid
    ✅ Correct Answer: C
57. **Q57.** In water, HCl acts as:
    A) Base
    B) Salt
    C) Acid
    D) Neutral
    ✅ Correct Answer: C
58. **Q58.** Which of the following solutions has the highest concentration of OH^- ions?
    A) pH = 7
    B) pH = 5
    C) pH = 9
    D) pH = 3
    ✅ Correct Answer: C
59. **Q59.** Which base is present in bleaching powder?
    A) $Ca(OH)_2$
    B) NaOH
    C) $Mg(OH)_2$
    D) NH_4OH
    ✅ Correct Answer: A
60. **Q60.** What is the conjugate acid of NH_3?
    A) NH_2^-
    B) NH_4^+
    C) N_2

D) NH_3^+

✅ Correct Answer: B

61. **61.** Which of these substances is commonly used as an antacid?
    A) HCl
    B) NaCl
    C) $Mg(OH)_2$
    D) H_2SO_4
    ✅ Correct Answer: C
62. **Q62.** What is the main use of acetic acid?
    A) As a fuel
    B) In vinegar
    C) As a fertilizer
    D) In detergents
    ✅ Correct Answer: B
63. **Q63.** What is the name of the process in which an acid and a base react to form salt and water?
    A) Hydrolysis
    B) Oxidation
    C) Neutralization
    D) Reduction
    ✅ Correct Answer: C
64. **Q64.** Which acid is found in citrus fruits?
    A) Acetic acid
    B) Citric acid
    C) Formic acid
    D) Lactic acid
    ✅ Correct Answer: B
65. **Q65.** The OH^- ion concentration of a solution is 1×10^{-4} M. Its pH is:
    A) 4
    B) 10
    C) 7
    D) 3
    ✅ Correct Answer: B
66. **Q66.** Which of the following is a diprotic acid?
    A) HCl
    B) HNO_3
    C) H_2SO_4
    D) CH_3COOH
    ✅ Correct Answer: C
67. **Q67.** Which of the following will NOT conduct electricity?
    A) NaOH solution
    B) CH_3COOH solution

C) Sugar solution
D) HCl solution
✅ Correct Answer: C

68. **Q68.** A weak base is:
A) KOH
B) NH_4OH
C) NaOH
D) $Ca(OH)_2$
✅ Correct Answer: B

69. **Q69.** What is the pH of a neutral solution at 25°C?
A) 5
B) 6
C) 7
D) 8
✅ Correct Answer: C

70. **Q70.** Which of the following is a base but not an alkali?
A) NaOH
B) KOH
C) $Cu(OH)_2$
D) $Ba(OH)_2$
✅ Correct Answer: C

71. **Q71.** What is the color of methyl orange in acidic medium?
A) Yellow
B) Red
C) Orange
D) Blue
✅ Correct Answer: B

72. **Q72.** A solution turns phenolphthalein colorless. It is likely:
A) Basic
B) Neutral
C) Acidic
D) Saline
✅ Correct Answer: C

73. **Q73.** Which of these is NOT an indicator?
A) Litmus
B) Methyl orange
C) Phenolphthalein
D) Glucose
✅ Correct Answer: D

74. **Q74.** Which acid is used in pickling of steel?
A) Nitric acid
B) Acetic acid

C) Hydrochloric acid
D) Citric acid
✅ Correct Answer: C

75. **Q75.** The taste of bases is usually:
A) Sour
B) Sweet
C) Bitter
D) Salty
✅ Correct Answer: C

76. **Q76.** An acid with a low pKa value is:
A) Strong acid
B) Weak acid
C) Neutral
D) None
✅ Correct Answer: A

77. **Q77.** Which of the following is used to measure the strength of an acid or base?
A) Barometer
B) Hygrometer
C) pH meter
D) Thermometer
✅ Correct Answer: C

78. **Q78.** What happens when CO_2 is passed through lime water?
A) Turns blue
B) Becomes clear
C) Turns milky
D) Turns red
✅ Correct Answer: C

79. **Q79.** Acid rain is mainly caused by which gases?
A) CO and CO_2
B) SO_2 and NO_2
C) CH_4 and CO
D) H_2 and O_2
✅ Correct Answer: B

80. **Q80.** The H^+ ion in water exists as:
A) Free ion
B) Hydride
C) Hydronium ion (H_3O^+)
D) Oxygen molecule
✅ Correct Answer: C

81. **Q81.** The reaction of an acid with a metal carbonate produces:
A) Salt + Hydrogen
B) Salt + Water

C) Salt + CO_2 + Water
D) Salt + Oxygen
✅ Correct Answer: C

82. **Q82.** Which one of the following substances is most alkaline?
A) Lemon juice
B) Vinegar
C) Baking soda solution
D) Ammonia solution
✅ Correct Answer: D

83. **Q83.** Which of the following can act as both acid and base?
A) HCl
B) H_2O
C) NaOH
D) KOH
✅ Correct Answer: B

84. **Q84.** Which of the following acids is a strong monoprotic acid?
A) H_2SO_4
B) HNO_3
C) H_2CO_3
D) H_3PO_4
✅ Correct Answer: B

85. **Q85.** The acid present in milk is:
A) Formic acid
B) Citric acid
C) Lactic acid
D) Tartaric acid
✅ Correct Answer: C

86. **Q86.** The base used in manufacturing soap is:
A) KOH
B) NH_4OH
C) $Mg(OH)_2$
D) $Cu(OH)_2$
✅ Correct Answer: A

87. **Q87.** What type of salt is formed from a strong acid and a strong base?
A) Acidic salt
B) Basic salt
C) Neutral salt
D) No salt
✅ Correct Answer: C

88. **Q88.** Which of the following is an amphoteric substance?
A) NaOH
B) HCl

C) H_2O
D) CH_3COOH
✅ Correct Answer: C

89. **Q89.** Which of the following is used in baking powder to react with $NaHCO_3$ and release CO_2?
A) HCl
B) Tartaric acid
C) Oxalic acid
D) Sulfuric acid
✅ Correct Answer: B

90. **Q90.** A solution is said to be acidic when its pH is:
A) Greater than 7
B) Equal to 7
C) Less than 7
D) Equal to 14
✅ Correct Answer: C

91. **Q91.** An example of a weak acid is:
A) HCl
B) H_2SO_4
C) CH_3COOH
D) HNO_3
✅ Correct Answer: C

92. **Q92.** Which salt is formed by the neutralization of HCl and NaOH?
A) NaCl
B) H_2O
C) Na_2CO_3
D) $NaHCO_3$
✅ Correct Answer: A

93. **Q93.** What is the function of a buffer solution?
A) Conducts electricity
B) Maintains constant pH
C) Changes color
D) Enhances taste
✅ Correct Answer: B

94. **Q94.** Which one of the following acids is tribasic?
A) HCl
B) HNO_3
C) H_2SO_4
D) H_3PO_4
✅ Correct Answer: D

95. **Q95.** pH is a measure of:
A) Temperature

B) Acidity or basicity
C) Salt concentration
D) Water hardness
✅ Correct Answer: B

96. **Q96.** When acid reacts with metal, which gas is released?
A) Oxygen
B) Nitrogen
C) Carbon dioxide
D) Hydrogen
✅ Correct Answer: D

97. **Q97.** Phenolphthalein in a basic solution turns:
A) Red
B) Colorless
C) Pink
D) Green
✅ Correct Answer: C

98. **Q98.** An acid is a proton:
A) Donor
B) Acceptor
C) Neutralizer
D) Inhibitor
✅ Correct Answer: A

99. **Q99.** NaOH is a:
A) Strong acid
B) Weak acid
C) Strong base
D) Weak base
✅ Correct Answer: C

100. **Q100.** Which of the following is a natural indicator?
A) Methyl orange
B) Phenolphthalein
C) Turmeric
D) pH paper
✅ Correct Answer: C

Chapter 5: Electrochemistry

1. **Q1.** Which of the following is a good conductor of electricity in molten state?
A) Sugar
B) NaCl
C) Urea

D) Glucose

✅ Correct Answer: B

2. **Q2.** What is the unit of electrical charge?
   A) Volt
   B) Ampere
   C) Ohm
   D) Coulomb
   ✅ Correct Answer: D
3. **Q3.** Electrolysis is a process that uses:
   A) Chemical energy
   B) Light energy
   C) Electrical energy
   D) Magnetic energy
   ✅ Correct Answer: C
4. **Q4.** The electrolyte used in the electrolysis of water is:
   A) NaOH
   B) NaCl
   C) H_2SO_4
   D) HNO_3
   ✅ Correct Answer: C
5. **Q5.** During electrolysis, the anode is:
   A) Positively charged
   B) Negatively charged
   C) Neutral
   D) Variable
   ✅ Correct Answer: A
6. **Q6.** Which metal is commonly refined using electrolysis?
   A) Iron
   B) Aluminum
   C) Copper
   D) Zinc
   ✅ Correct Answer: C
7. **Q7.** Which of the following is not an electrolyte?
   A) NaCl solution
   B) Sugar solution
   C) HCl solution
   D) KOH solution
   ✅ Correct Answer: B
8. **Q8.** The flow of electrons in a conductor is called:
   A) Voltage
   B) Current
   C) Resistance

D) Capacitance

✅ Correct Answer: B

9. **Q9.** In galvanic cells, chemical energy is converted into:
   A) Mechanical energy
   B) Light energy
   C) Electrical energy
   D) Thermal energy
   ✅ Correct Answer: C
10. **Q10.** What is the electrode where reduction occurs called?
   A) Cathode
   B) Anode
   C) Diode
   D) Node
   ✅ Correct Answer: A
11. **Q11.** The anode in a galvanic cell is:
   A) Site of oxidation
   B) Site of reduction
   C) Neutral
   D) Always positive
   ✅ Correct Answer: A
12. **Q12.** What is the function of a salt bridge in an electrochemical cell?
   A) To supply electrons
   B) To prevent ions from moving
   C) To maintain electrical neutrality
   D) To increase current
   ✅ Correct Answer: C
13. **Q13.** Which instrument is used to measure electric current?
   A) Voltmeter
   B) Ammeter
   C) Multimeter
   D) Ohmmeter
   ✅ Correct Answer: B
14. **Q14.** A voltaic cell produces electricity due to:
   A) Movement of ions only
   B) Chemical reaction
   C) Heating of electrolyte
   D) Magnetic field
   ✅ Correct Answer: B
15. **Q15.** In electrolysis, cations migrate towards:
   A) Cathode
   B) Anode
   C) Both electrodes

D) Do not migrate

✅ Correct Answer: A

16. **Q16.** Which of the following solutions conducts electricity the best?
    A) Distilled water
    B) Sugar solution
    C) Salt solution
    D) Alcohol solution
    ✅ Correct Answer: C
17. **Q17.** The quantity of electricity required to liberate 1 mole of hydrogen gas is:
    A) 96,500 C
    B) 9,650 C
    C) 1,000 C
    D) 100 C
    ✅ Correct Answer: A
18. **Q18.** What happens at the cathode during electrolysis?
    A) Oxidation
    B) Evaporation
    C) Reduction
    D) Heating
    ✅ Correct Answer: C
19. **Q19.** Which gas is released at the anode during the electrolysis of water?
    A) Hydrogen
    B) Oxygen
    C) Nitrogen
    D) Carbon dioxide
    ✅ Correct Answer: B
20. **Q20.** Which part of an electrolytic cell is the positive terminal?
    A) Cathode
    B) Anode
    C) Salt bridge
    D) Electrolyte
    ✅ Correct Answer: B
21. **Q21.** The process of electroplating involves:
    A) Oxidation at both electrodes
    B) Reduction at both electrodes
    C) Oxidation at anode, reduction at cathode
    D) No redox reaction
    ✅ Correct Answer: C
22. **Q22.** Which one of the following is used in the electroplating of gold?
    A) $AuCl_3$
    B) $HAuCl_4$
    C) $KAu(CN)_2$

D) $Au(NO_3)_3$

✅ Correct Answer: C

23. **Q23.** What is the charge on the ions that migrate towards the cathode?
    A) Positive
    B) Negative
    C) Neutral
    D) None
    ✅ Correct Answer: A
24. **Q24.** Which of the following metals cannot be easily refined by electrolysis?
    A) Silver
    B) Copper
    C) Iron
    D) Sodium
    ✅ Correct Answer: D
25. **Q25.** In the electrolysis of $CuSO_4$ solution using copper electrodes, the mass of:
    A) Cathode increases, anode decreases
    B) Anode increases, cathode decreases
    C) Both increase
    D) Both decrease
    ✅ Correct Answer: A
26. **Q26.** During electrolysis of molten NaCl, which gas is liberated at the anode?
    A) Hydrogen
    B) Chlorine
    C) Oxygen
    D) Nitrogen
    ✅ Correct Answer: B
27. **Q27.** Which metal is commonly extracted by electrolysis?
    A) Iron
    B) Zinc
    C) Aluminum
    D) Lead
    ✅ Correct Answer: C
28. **Q28.** Which part of the cell is necessary to complete the internal circuit?
    A) Wire
    B) Salt bridge
    C) Battery
    D) Electrodes
    ✅ Correct Answer: B
29. **Q29.** Electrochemical cells convert chemical energy into:
    A) Heat
    B) Electrical energy
    C) Light

D) Sound

✅ Correct Answer: B

30. **Q30.** Which one of the following is a strong electrolyte?
    A) Acetic acid
    B) H_2O
    C) NaCl
    D) Glucose
    ✅ Correct Answer: C
31. **Q31.** What is Faraday's First Law of Electrolysis?
    A) E = IR
    B) Q = It
    C) Mass ∝ Quantity of electricity
    D) V = IR
    ✅ Correct Answer: C
32. **Q32.** A Daniell cell is made of:
    A) Zn and Cu
    B) Fe and Cu
    C) Ag and Zn
    D) Mg and Al
    ✅ Correct Answer: A
33. **Q33.** What is the standard electrode potential of hydrogen electrode?
    A) +1 V
    B) −1 V
    C) 0 V
    D) +0.5 V
    ✅ Correct Answer: C
34. **Q34.** In the electrolysis of acidified water, the volume ratio of hydrogen to oxygen evolved is:
    A) 1:1
    B) 2:1
    C) 1:2
    D) 3:1
    ✅ Correct Answer: B
35. **Q35.** What is deposited on the cathode during electroplating with silver?
    A) Silver metal
    B) Silver oxide
    C) Silver chloride
    D) Silver nitrate
    ✅ Correct Answer: A
36. **Q36.** The resistance to the flow of electric current is called:
    A) Conductance
    B) Resistance

C) Capacitance
D) Inductance
✅ Correct Answer: B

37. **Q37.** Which of the following is an application of electrochemistry?
A) Electroplating
B) Electrorefining
C) Electrolysis
D) All of the above
✅ Correct Answer: D

38. **Q38.** The voltage of a Daniell cell is approximately:
A) 0.34 V
B) 0.76 V
C) 1.10 V
D) 2.00 V
✅ Correct Answer: C

39. **Q39.** Which type of reaction occurs in a galvanic cell?
A) Neutralization
B) Oxidation-reduction
C) Precipitation
D) Double displacement
✅ Correct Answer: B

40. **Q40.** The cation in $CuSO_4$ is:
A) SO_4^{2-}
B) H^+
C) Cu^{2+}
D) Cu^-
✅ Correct Answer: C

41. **Q41.** What is the function of the cathode in an electrolytic cell?
A) Source of electrons
B) Site of oxidation
C) Site of reduction
D) Supplies ions
✅ Correct Answer: C

42. **Q42.** In electrolysis, ions move due to:
A) Heat
B) Pressure
C) Electric field
D) Gravity
✅ Correct Answer: C

43. **Q43.** Which statement is correct regarding an electrochemical cell?
A) Electrons flow from cathode to anode
B) Reduction occurs at anode

C) Oxidation occurs at anode
D) Salt bridge prevents ion flow
✅ Correct Answer: C

44. **Q44.** Which one of the following metals is most reactive in electrochemical series?
A) Zinc
B) Copper
C) Silver
D) Potassium
✅ Correct Answer: D

45. **Q45.** Electroplating is primarily used for:
A) Increasing strength
B) Reducing cost
C) Improving appearance and preventing corrosion
D) Making alloys
✅ Correct Answer: C

46. **Q46.** How many faradays are required to deposit 1 mole of Al^{3+}?
A) 1
B) 2
C) 3
D) 6
✅ Correct Answer: C

47. **Q47.** What is the electrode potential of Zn^{2+}/Zn?
A) +0.34 V
B) −0.76 V
C) 0.00 V
D) +1.66 V
✅ Correct Answer: B

48. **Q48.** The process of removing metal ions from a solution using electricity is called:
A) Electrorefining
B) Electroplating
C) Electrowinning
D) Electrolysis
✅ Correct Answer: C

49. **Q49.** In the electrolysis of $CuSO_4$ with inert electrodes, the blue color:
A) Increases
B) Decreases
C) Remains the same
D) Becomes green
✅ Correct Answer: B

50. **Q50.** Which of the following acts as an inert electrode?
A) Zinc
B) Platinum

C) Copper
D) Iron
✅ Correct Answer: B

51. **Q51.** The unit of conductance is:
A) Ohm
B) Siemens
C) Ampere
D) Volt
✅ Correct Answer: B

52. **Q52.** What is the flow of ions in a solution called?
A) Ionization
B) Ionic current
C) Ion potential
D) Electromotive force
✅ Correct Answer: B

53. **Q53.** Which gas is evolved at cathode during electrolysis of acidified water?
A) Oxygen
B) Chlorine
C) Hydrogen
D) Nitrogen
✅ Correct Answer: C

54. **Q54.** Which electrode is positively charged in an electrolytic cell?
A) Cathode
B) Anode
C) Both
D) None
✅ Correct Answer: B

55. **Q55.** In a galvanic cell, the salt bridge prevents:
A) Flow of electrons
B) Accumulation of charges
C) Oxidation
D) Reduction
✅ Correct Answer: B

56. **Q56.** What is deposited at the cathode when molten NaCl is electrolyzed?
A) Cl_2
B) H_2
C) Na
D) NaOH
✅ Correct Answer: C

57. **Q57.** Faraday's second law is based on:
A) Atomic number
B) Molecular mass

C) Equivalent mass
D) Volume
✅ Correct Answer: C

58. **Q58.** Which property is required for a substance to conduct electricity in solution?
A) It must be organic
B) It must be soluble
C) It must form ions
D) It must form molecules
✅ Correct Answer: C

59. **Q59.** Which of the following statements is true for a spontaneous redox reaction?
A) $\Delta G = 0$
B) $E°cell < 0$
C) $\Delta G < 0$
D) $E°cell = 0$
✅ Correct Answer: C

60. **Q60.** In the electrochemical series, the element with the most negative standard reduction potential is:
A) F_2
B) Li
C) H_2
D) Zn
✅ Correct Answer: B

61. **Q61.** What happens at the anode during electrolysis?
A) Reduction
B) Ionization
C) Oxidation
D) Neutralization
✅ Correct Answer: C

62. **Q62.** Which of the following metals is least likely to be deposited during electroplating?
A) Gold
B) Copper
C) Silver
D) Sodium
✅ Correct Answer: D

63. **Q63.** The number of coulombs required to deposit 1 mole of Ag^+ is:
A) 96500
B) 193000
C) 48250
D) 1000
✅ Correct Answer: A

64. **Q64.** Which component completes the electrical circuit in a galvanic cell?
A) Electrolyte

B) External wire
C) Salt bridge
D) Electrode
✅ Correct Answer: C

65. **Q65.** Electrolysis is a type of:
A) Endothermic reaction
B) Exothermic reaction
C) Spontaneous reaction
D) Photochemical reaction
✅ Correct Answer: A

66. **Q66.** What is the correct cell notation for a galvanic cell involving Zn and Cu?
A) Zn | Zn^{2+} || Cu^{2+} | Cu
B) Cu | Cu^{2+} || Zn^{2+} | Zn
C) Zn^{2+} | Zn || Cu^{2+} | Cu
D) Zn | Cu || Zn^{2+} | Cu^{2+}
✅ Correct Answer: A

67. **Q67.** In an electrochemical cell, the electrons flow from:
A) Cathode to anode
B) Anode to cathode
C) Salt bridge
D) Electrolyte to electrode
✅ Correct Answer: B

68. **Q68.** Electrolytic refining of copper uses:
A) Cu as cathode and impure Cu as anode
B) Cu as anode and graphite as cathode
C) Graphite as both electrodes
D) Cu as cathode and graphite as anode
✅ Correct Answer: A

69. **Q69.** Which solution is best suited for electroplating silver?
A) $AgNO_3$
B) AgCl
C) AgBr
D) AgI
✅ Correct Answer: A

70. **Q70.** What is the molar conductivity of an electrolyte?
A) Conductance of 1 mole of electrolyte in unit volume
B) Conductance of a solution per unit concentration
C) Conductance per unit area
D) Conductance per mole per volume
✅ Correct Answer: A

71. **Q71.** During electrolysis, the amount of substance liberated is directly proportional to:
A) Time only

B) Voltage only
C) Current only
D) Charge passed
✅ Correct Answer: D

72. **Q72.** A salt bridge contains:
A) Solid salt
B) Molten salt
C) Electrolytic solution
D) Insulating material
✅ Correct Answer: C

73. **Q73.** Electrolytes conduct electricity due to:
A) Free electrons
B) Movement of atoms
C) Movement of ions
D) Polarization
✅ Correct Answer: C

74. **Q74.** Electrochemical cell energy is measured in:
A) Volts
B) Joules
C) Watts
D) Coulombs
✅ Correct Answer: A

75. **Q75.** The movement of ions during electrolysis is known as:
A) Diffusion
B) Electromigration
C) Osmosis
D) Sublimation
✅ Correct Answer: B

76. **Q76.** In a galvanic cell, the cathode is:
A) Negative terminal
B) Positive terminal
C) Neutral
D) Reversible
✅ Correct Answer: B

77. **Q77.** Which of the following affects electrolysis?
A) Current
B) Time
C) Electrolyte
D) All of the above
✅ Correct Answer: D

78. **Q78.** What happens when copper is electrolyzed using copper sulfate and graphite electrodes?

A) Copper is deposited on cathode
B) Oxygen is liberated at anode
C) No change at cathode
D) Both A and B
✅ Correct Answer: D

79. **Q79.** Electroplating is best done using:
A) Direct current
B) Alternating current
C) Static electricity
D) None of the above
✅ Correct Answer: A

80. **Q80.** If 1 Faraday deposits 1 mole of silver, how many Faradays are needed to deposit 0.5 mol of copper (Cu^{2+})?
A) 0.5
B) 1
C) 2
D) 0.25
✅ Correct Answer: B

81. **Q81.** The process of extracting metal from its molten ore using electricity is:
A) Electroplating
B) Electrowinning
C) Electrorefining
D) Pyrometallurgy
✅ Correct Answer: B

82. **Q82.** The voltage of a galvanic cell depends on:
A) Temperature
B) Concentration of ions
C) Nature of electrodes
D) All of the above
✅ Correct Answer: D

83. **Q83.** Which of the following is a redox reaction?
A) NaCl formation
B) $H_2 + Cl_2 \rightarrow 2HCl$
C) $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
D) $HCl + NaOH \rightarrow NaCl + H_2O$
✅ Correct Answer: B

84. **Q84.** What is the main application of Daniell Cell?
A) Medical purposes
B) Photography
C) Power supply in labs
D) Electrolysis
✅ Correct Answer: C

85. **Q85.** Which of the following is used as an electrolyte in a dry cell?
    A) H_2SO_4
    B) NaCl
    C) NH_4Cl
    D) KCl
    ✅ Correct Answer: C
86. **Q86.** Which of the following batteries is rechargeable?
    A) Dry cell
    B) Mercury cell
    C) Lead-acid battery
    D) Zinc-carbon battery
    ✅ Correct Answer: C
87. **Q87.** What is the charge on an electron?
    A) 1.6×10^{-19} C
    B) -1.6×10^{-19} C
    C) 0
    D) $+1.6 \times 10^{-19}$ C
    ✅ Correct Answer: B
88. **Q88.** Which component in a galvanic cell prevents the mixing of solutions?
    A) Electrolyte
    B) Electrodes
    C) Salt bridge
    D) Diaphragm
    ✅ Correct Answer: C
89. **Q89.** Electrochemical cells convert:
    A) Mechanical energy to chemical energy
    B) Chemical energy to electrical energy
    C) Light energy to electrical energy
    D) Electrical energy to thermal energy
    ✅ Correct Answer: B
90. **Q90.** Electrolysis of NaCl solution produces:
    A) Na and Cl_2
    B) H_2 and Cl_2
    C) NaOH and Cl_2
    D) H_2, Cl_2 and NaOH
    ✅ Correct Answer: D
91. **Q91.** The EMF of a cell depends on:
    A) Type of electrodes
    B) Temperature
    C) Ion concentration
    D) All of the above
    ✅ Correct Answer: D

92. **Q92.** The term "electrode potential" refers to:
    A) Voltage between two batteries
    B) Potential difference between electrode and solution
    C) Total voltage of a cell
    D) None of the above
    ✅ Correct Answer: B
93. **Q93.** The metal used in electroplating artificial jewelry is:
    A) Nickel
    B) Zinc
    C) Gold
    D) Tin
    ✅ Correct Answer: A
94. **Q94.** The net ionic reaction in a zinc-copper cell is:
    A) $Zn + Cu \rightarrow Zn^{2+} + Cu^{2+}$
    B) $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$
    C) $Cu + Zn^{2+} \rightarrow Cu^{2+} + Zn$
    D) $Zn^{2+} + Cu^{2+} \rightarrow Zn + Cu$
    ✅ Correct Answer: B
95. **Q95.** One mole of electrons is equal to:
    A) 6.022×10^{23} electrons
    B) 96500 C
    C) 1 Faraday
    D) All of the above
    ✅ Correct Answer: D
96. **Q96.** Which gas is released at the anode in electrolysis of NaCl solution?
    A) H_2
    B) Cl_2
    C) O_2
    D) N_2
    ✅ Correct Answer: B
97. **Q97.** The main function of a salt bridge is to:
    A) Transfer electrons
    B) Maintain charge neutrality
    C) Complete the circuit
    D) Both B and C
    ✅ Correct Answer: D
98. **Q98.** Which of the following is **not** an application of electrolysis?
    A) Electroplating
    B) Electrorefining
    C) Photographic film development
    D) Electrowinning
    ✅ Correct Answer: C

99. **Q99.** What is the electrode potential of standard hydrogen electrode (SHE)?
A) +1 V
B) –1 V
C) 0 V
D) +0.44 V
✅ Correct Answer: C

100. **Q100.** In electrolysis of water, the volume of hydrogen collected is:
A) Equal to oxygen
B) Half of oxygen
C) Twice that of oxygen
D) Three times oxygen
✅ Correct Answer: C

Chapter 6: Water Technology

1. **Q1.** Which of the following is the most common impurity in water?
A) Chlorine
B) Calcium
C) Iron
D) Fluorine
✅ Correct Answer: B

2. **Q2.** Temporary hardness of water is due to the presence of:
A) Calcium sulfate
B) Calcium chloride
C) Calcium bicarbonate
D) Magnesium nitrate
✅ Correct Answer: C

3. **Q3.** Permanent hardness of water is due to:
A) Bicarbonates of calcium and magnesium
B) Chlorides and sulfates of calcium and magnesium
C) Sodium bicarbonate
D) Potassium carbonate
✅ Correct Answer: B

4. **Q4.** The process of removing hardness by using washing soda is called:
A) Ion exchange
B) Zeolite method
C) Lime-soda method
D) Precipitation method
✅ Correct Answer: D

5. **Q5.** Which chemical is used in the zeolite method for softening water?
A) Na_2CO_3

B) $NaAlO_2$
C) Na_2Ze
D) CaZe
✅ Correct Answer: C

6. **Q6.** Which ion is exchanged during the zeolite process?
A) Na^+ with Ca^{2+} and Mg^{2+}
B) Na^+ with Fe^{2+}
C) K^+ with Mg^{2+}
D) Cl^- with $SO_4{}^{2-}$
✅ Correct Answer: A
7. **Q7.** The unit of hardness of water is:
A) ppm
B) mg/L
C) Degrees Clark
D) All of the above
✅ Correct Answer: D
8. **Q8.** Hardness of water causes:
A) Hair loss
B) Skin allergy
C) Scaling in boilers
D) Discoloration of water
✅ Correct Answer: C
9. **Q9.** Which reagent is used in EDTA titration for determining hardness?
A) Methyl orange
B) EBT (Eriochrome Black T)
C) Phenolphthalein
D) Methylene blue
✅ Correct Answer: B
10. **Q10.** The endpoint of EDTA titration is indicated by:
A) Colorless to pink
B) Blue to red
C) Wine red to blue
D) Yellow to colorless
✅ Correct Answer: C
11. **Q11.** The total hardness of water is the sum of:
A) Temporary + Carbonate hardness
B) Permanent + Non-carbonate hardness
C) Temporary + Permanent hardness
D) None of the above
✅ Correct Answer: C
12. **Q12.** The chemical formula of EDTA is:
A) $C_2H_6O_6$

B) $C_{10}H_{16}N_2O_8$
C) $C_6H_8O_7$
D) $C_6H_6O_6$
✅ Correct Answer: B

13. **Q13.** Which of the following causes boiler corrosion?
A) Dissolved oxygen
B) Carbon dioxide
C) Scale formation
D) Both A and B
✅ Correct Answer: D

14. **Q14.** Which compound is used to remove dissolved oxygen from boiler feed water?
A) Na_2SO_3
B) NaCl
C) Na_2CO_3
D) NaOH
✅ Correct Answer: A

15. **Q15.** Soda lime method involves the use of:
A) NaOH and $Ca(OH)_2$
B) Na_2CO_3 and $Ca(OH)_2$
C) $NaHCO_3$ and $Mg(OH)_2$
D) Na_2CO_3 and HCl
✅ Correct Answer: B

16. **Q16.** The major disadvantage of hard water is:
A) It tastes sweet
B) Forms less lather with soap
C) Boils at higher temperature
D) All of the above
✅ Correct Answer: B

17. **Q17.** Rainwater is naturally soft because:
A) It has no dissolved salts
B) It contains CO_2
C) It has no suspended particles
D) It is filtered naturally
✅ Correct Answer: A

18. **Q18.** The resin used in the ion exchange method is:
A) Cellulose
B) Styrene-divinylbenzene copolymer
C) Polyethylene
D) Bakelite
✅ Correct Answer: B

19. **Q19.** Ion exchange process is also known as:
A) Lime soda process

B) Base exchange process
C) Thermal method
D) Distillation
✅ Correct Answer: B

20. **Q20.** Water with a hardness of more than 300 ppm is considered:
A) Soft
B) Moderately hard
C) Hard
D) Very hard
✅ Correct Answer: D

21. **Q21.** The presence of Mg^{2+} ions in water mainly contributes to:
A) Temporary hardness
B) Permanent hardness
C) Both A and B
D) Corrosion
✅ Correct Answer: C

22. **Q22.** Water that forms lather easily with soap is:
A) Hard water
B) Distilled water
C) Soft water
D) Saline water
✅ Correct Answer: C

23. **Q23.** Permanent hardness of water can be removed by:
A) Boiling
B) Addition of $Ca(OH)_2$
C) Ion exchange method
D) Filtration
✅ Correct Answer: C

24. **Q24.** The hardness caused by $Mg(HCO_3)_2$ is:
A) Temporary
B) Permanent
C) Both A and B
D) Non-removable
✅ Correct Answer: A

25. **Q25.** Clark's method is used to remove:
A) Permanent hardness
B) Temporary hardness
C) Dissolved gases
D) Suspended solids
✅ Correct Answer: B

26. **Q26.** Lime soda softening method removes hardness by:
A) Oxidation

B) Ion exchange
C) Precipitation
D) Distillation
✅ Correct Answer: C

27. **Q27.** The total hardness of water is expressed as equivalent of:
A) $CaCO_3$
B) $MgSO_4$
C) Na_2CO_3
D) H_2O
✅ Correct Answer: A

28. **Q28.** The substance used to regenerate exhausted zeolite is:
A) NaCl
B) NaOH
C) Na_2CO_3
D) $CaCl_2$
✅ Correct Answer: A

29. **Q29.** Ca^{2+} and Mg^{2+} ions in water can be removed using:
A) Activated charcoal
B) Ion exchange resin
C) HCl
D) Baking soda
✅ Correct Answer: B

30. **Q30.** The ideal drinking water should be:
A) Acidic
B) Hard
C) Neutral and soft
D) Basic and salty
✅ Correct Answer: C

31. **Q31.** The endpoint in EDTA titration for water hardness is identified by:
A) Disappearance of blue color
B) Disappearance of wine red color
C) Formation of turbidity
D) Smell change
✅ Correct Answer: B

32. **Q32.** Which of the following does **not** cause water hardness?
A) $Ca(HCO_3)_2$
B) $MgCl_2$
C) NaCl
D) $CaSO_4$
✅ Correct Answer: C

33. **Q33.** The ion exchange method for softening water is:
A) Chemical process

B) Physical process
C) Reversible chemical process
D) Electrochemical process
✅ Correct Answer: C

34. **Q34.** Zeolite used in water softening is a:
A) Natural silicate mineral
B) Synthetic polymer
C) Metal oxide
D) None of the above
✅ Correct Answer: A

35. **Q35.** $Ca^{2+} + Na_2Ze \rightarrow ?$
A) CaZe + Na
B) CaZe + $2Na^+$
C) $CaZe_2$ + Na
D) Ca + Na_2Ze
✅ Correct Answer: B

36. **Q36.** During hardness determination using EDTA, buffer is added to maintain:
A) Acidic pH
B) Neutral pH
C) Alkaline pH
D) None of the above
✅ Correct Answer: C

37. **Q37.** Scale formation in boilers is mainly due to:
A) Soft water
B) Soap
C) Hard water
D) Iron salts
✅ Correct Answer: C

38. **Q38.** Which of the following causes alkalinity in water?
A) OH^-
B) CO_3^{2-}
C) HCO_3^-
D) All of the above
✅ Correct Answer: D

39. **Q39.** The softness of water is measured by:
A) Titration
B) Turbidity meter
C) Soap test
D) pH meter
✅ Correct Answer: A

40. **Q40.** EDTA stands for:
A) Ethylene diamine tetra acetic acid

B) Ethyl dicarboxylic acid
C) Ethane dimethyl amino acid
D) None of the above
✅ Correct Answer: A

41. **Q41.** The main use of EDTA in water treatment is to:
A) Precipitate heavy metals
B) Remove microorganisms
C) Chelate calcium and magnesium ions
D) Disinfect water
✅ Correct Answer: C

42. **Q42.** The regeneration of ion exchange resins is done using:
A) Distilled water
B) Common salt solution
C) Sodium bicarbonate
D) Vinegar
✅ Correct Answer: B

43. **Q43.** Which of the following is used to soften hard water on a large scale?
A) Soda lime method
B) Boiling
C) Reverse osmosis
D) Ion exchange method
✅ Correct Answer: A

44. **Q44.** Which of the following is **not** a method of softening water?
A) Lime-soda process
B) Zeolite process
C) Electrolysis
D) Ion-exchange process
✅ Correct Answer: C

45. **Q45.** The buffer solution used in EDTA titration has a pH of:
A) 4
B) 7
C) 10
D) 2
✅ Correct Answer: C

46. **Q46.** Which property of water affects its hardness?
A) Electrical conductivity
B) Presence of dissolved salts
C) Turbidity
D) Odor
✅ Correct Answer: B

47. **Q47.** Total hardness of water includes:
A) Carbonate hardness only

B) Non-carbonate hardness only
C) Both carbonate and non-carbonate hardness
D) Neither of them
✅ Correct Answer: C

48. **Q48.** Temporary hardness is removed by:
A) Passing through a filter
B) Boiling
C) Adding chlorine
D) Electrolysis
✅ Correct Answer: B

49. **Q49.** Hardness of water does **not** affect:
A) Taste
B) Soap consumption
C) Boiler efficiency
D) Water color
✅ Correct Answer: D

50. **Q50.** The unit 'ppm' used in water hardness means:
A) Parts per microgram
B) Parts per meter
C) Parts per million
D) Parts per molecule
✅ Correct Answer: C

51. **Q51.** The primary source of magnesium in hard water is:
A) $Mg(NO_3)_2$
B) $MgCl_2$
C) $MgSO_4$
D) All of the above
✅ Correct Answer: D

52. **Q52.** In EDTA titration, the wine red color is due to:
A) EDTA
B) Metal ion
C) EBT-metal complex
D) Free metal ion
✅ Correct Answer: C

53. **Q53.** Which of the following processes does **not** remove permanent hardness?
A) Lime-soda method
B) Ion exchange process
C) Zeolite method
D) Boiling
✅ Correct Answer: D

54. **Q54.** The presence of Fe^{2+} in water indicates:
A) Temporary hardness

B) Alkalinity
C) Corrosiveness
D) Organic pollution
✅ Correct Answer: C

55. **Q55.** The chemical name of lime used in water softening is:
A) Sodium hydroxide
B) Potassium carbonate
C) Calcium hydroxide
D) Calcium sulfate
✅ Correct Answer: C

56. **Q56.** Which of the following indicates hardness in water?
A) High pH
B) Low pH
C) Less lather formation
D) Cloudiness
✅ Correct Answer: C

57. **Q57.** The metal ions removed in water softening are:
A) Na^+ and K^+
B) Ca^{2+} and Mg^{2+}
C) Fe^{3+} and Al^{3+}
D) H^+ and OH^-
✅ Correct Answer: B

58. **Q58.** Which of the following methods is cheapest for water softening?
A) Lime soda process
B) Ion exchange method
C) EDTA titration
D) Reverse osmosis
✅ Correct Answer: A

59. **Q59.** Which of the following causes foaming in boilers?
A) Hardness
B) Oils and greases
C) Iron salts
D) Algae
✅ Correct Answer: B

60. **Q60.** The major drawback of the zeolite process is:
A) Requires high temperature
B) Expensive
C) Ineffective for acidic water
D) Requires large space
✅ Correct Answer: C

61. **Q61.** Which of the following is used as an indicator in EDTA titration?
A) Methyl orange

B) Phenolphthalein
C) Eriochrome Black T
D) Potassium dichromate
✅ Correct Answer: C

62. **Q62.** The zeolite process is also known as:
A) Ion-exchange process
B) Base-exchange process
C) Reverse osmosis
D) Chlorination
✅ Correct Answer: B

63. **Q63.** Which impurity causes alkalinity in water?
A) NaCl
B) H_2SO_4
C) $Ca(HCO_3)_2$
D) $MgCl_2$
✅ Correct Answer: C

64. **Q64.** The regeneration of cation exchanger is done by:
A) NaCl
B) HCl or H_2SO_4
C) $Ca(OH)_2$
D) Na_2CO_3
✅ Correct Answer: B

65. **Q65.** In EDTA titration, the wine red color changes to _____ at the endpoint.
A) Green
B) Blue
C) Colorless
D) Red
✅ Correct Answer: B

66. **Q66.** Water that is free from all dissolved salts is known as:
A) Soft water
B) Mineral water
C) Distilled water
D) Demineralized water
✅ Correct Answer: D

67. **Q67.** Which of the following methods removes both temporary and permanent hardness?
A) Boiling
B) Ion exchange
C) Clark's method
D) Filtration
✅ Correct Answer: B

68. **Q68.** In the lime-soda process, soda ash reacts with:
    A) Ca^{2+}
    B) Mg^{2+}
    C) HCO_3^-
    D) All of the above
    ✅ Correct Answer: A
69. **Q69.** Which is more suitable for domestic use?
    A) Hard water
    B) Soft water
    C) Saline water
    D) Acidic water
    ✅ Correct Answer: B
70. **Q70.** Which type of hardness is removed by zeolite?
    A) Temporary only
    B) Permanent only
    C) Both temporary and permanent
    D) None
    ✅ Correct Answer: C
71. **Q71.** Which of the following is a natural zeolite?
    A) Zeolite A
    B) Permutit
    C) Feldspar
    D) Sodium aluminosilicate
    ✅ Correct Answer: C
72. **Q72.** What is the molar mass of EDTA?
    A) 292 g/mol
    B) 372 g/mol
    C) 190 g/mol
    D) 230 g/mol
    ✅ Correct Answer: A
73. **Q73.** The EDTA method of hardness determination is:
    A) Precipitation titration
    B) Redox titration
    C) Complexometric titration
    D) Acid-base titration
    ✅ Correct Answer: C
74. **Q74.** Which of the following is **not** a disadvantage of hard water?
    A) Wastage of soap
    B) Scaling in boilers
    C) Good taste
    D) Corrosion in pipelines
    ✅ Correct Answer: C

75. **Q75.** The function of buffer in hardness titration is to:
    A) Act as a catalyst
    B) Maintain pH
    C) Neutralize acids
    D) Improve accuracy
    ✅ Correct Answer: B
76. **Q76.** Water with total hardness less than 50 ppm is classified as:
    A) Soft
    B) Moderately hard
    C) Hard
    D) Very hard
    ✅ Correct Answer: A
77. **Q77.** The lime-soda method is used for:
    A) Disinfection
    B) Softening
    C) Dechlorination
    D) Decolorization
    ✅ Correct Answer: B
78. **Q78.** Total hardness is the sum of:
    A) Carbonate + Non-carbonate hardness
    B) Only carbonate hardness
    C) Only non-carbonate hardness
    D) Alkalinity
    ✅ Correct Answer: A
79. **Q79.** Demineralized water is:
    A) Water with minerals
    B) Water with salts
    C) Pure water
    D) Rainwater
    ✅ Correct Answer: C
80. **Q80.** Clark's process is used to remove:
    A) Suspended solids
    B) Bacteria
    C) Temporary hardness
    D) Salts
    ✅ Correct Answer: C
81. **Q81.** Which process can be used to treat both acidic and alkaline water?
    A) Distillation
    B) Ion exchange
    C) Chlorination
    D) Coagulation
    ✅ Correct Answer: B

82. **Q82.** The term "soft water" refers to water that:
    A) Contains dissolved gases
    B) Contains fewer dissolved salts
    C) Has high alkalinity
    D) Has neutral pH
    ✅ Correct Answer: B
83. **Q83.** The main problem caused by hard water in boilers is:
    A) High conductivity
    B) Scale formation
    C) Foam formation
    D) Low pH
    ✅ Correct Answer: B
84. **Q84.** Zeolite is chemically:
    A) Sodium aluminosilicate
    B) Calcium carbonate
    C) Magnesium sulfate
    D) Sodium chloride
    ✅ Correct Answer: A
85. **Q85.** The ideal pH for EDTA titration is:
    A) 2
    B) 5
    C) 7
    D) 10
    ✅ Correct Answer: D
86. **Q86.** In the lime-soda method, which chemical removes magnesium salts?
    A) Lime
    B) Soda
    C) Zeolite
    D) None
    ✅ Correct Answer: A
87. **Q87.** The hardness of water expressed in ppm is calculated as:
    A) mg/L of $CaCO_3$
    B) mol/L of H_2O
    C) g/L of $CaCl_2$
    D) kg/m^3 of $MgSO_4$
    ✅ Correct Answer: A
88. **Q88.** The temporary hardness of water is caused by:
    A) Chlorides
    B) Sulfates
    C) Bicarbonates
    D) Nitrates
    ✅ Correct Answer: C

89. **Q89.** Which is the most efficient method to produce ultrapure water?
    A) Boiling
    B) Filtration
    C) Ion exchange
    D) Reverse osmosis
    ✅ Correct Answer: D
90. **Q90.** The reaction between $Ca(HCO_3)_2$ and heat gives:
    A) $Ca(OH)_2$
    B) $CaCO_3 + CO_2 + H_2O$
    C) $CaSO_4$
    D) $CaCl_2$
    ✅ Correct Answer: B
91. **Q91.** Which of the following is used to calculate the amount of hardness from EDTA titration?
    A) Normality formula
    B) Molarity formula
    C) Complexometric equation
    D) Volume × Molarity × 1000 / Volume of sample
    ✅ Correct Answer: D
92. **Q92.** The exchangeable ions in zeolite are:
    A) Na^+
    B) Ca^{2+}
    C) K^+
    D) Cl^-
    ✅ Correct Answer: A
93. **Q93.** Which form of EDTA is used in titration?
    A) Na_2EDTA
    B) Disodium salt of EDTA
    C) H_4EDTA
    D) EDTA acid
    ✅ Correct Answer: B
94. **Q94.** A good boiler feed water should be:
    A) Soft
    B) Acidic
    C) Alkaline
    D) Salty
    ✅ Correct Answer: A
95. **Q95.** During EDTA titration, calcium and magnesium form complexes with:
    A) Buffer
    B) EBT
    C) EDTA

D) Water

✅ Correct Answer: C

96. **Q96.** The zeolite process cannot remove:
    A) Ca^{2+}
    B) Mg^{2+}
    C) Fe^{2+}
    D) Na^{+}
    ✅ Correct Answer: D
97. **Q97.** Which method uses a semipermeable membrane?
    A) Ion exchange
    B) EDTA titration
    C) Zeolite process
    D) Reverse osmosis
    ✅ Correct Answer: D
98. **Q98.** Water used for laboratory experiments should be:
    A) Soft
    B) Hard
    C) Distilled or deionized
    D) Boiled
    ✅ Correct Answer: C
99. **Q99.** The hardness of water is commonly measured in terms of:
    A) pH
    B) Alkalinity
    C) $CaCO_3$ equivalents
    D) Density
    ✅ Correct Answer: C
100. **Q100.** In the lime-soda process, excess lime causes:
    A) Hardness
    B) Corrosion
    C) Alkalinity
    D) Scaling
    ✅ Correct Answer: C

Chapter 7: Corrosion

1. **Q1.** Corrosion is defined as:
    A) Formation of rust
    B) Destruction of materials due to chemical reactions
    C) Oxidation of metals only
    D) Surface polishing
    ✅ Correct Answer: B

2. **Q2.** Rust is chemically:
   A) $Fe_2O_3 \cdot xH_2O$
   B) $Fe(OH)_2$
   C) Fe_3O_4
   D) $FeSO_4$
   ✅ Correct Answer: A
3. **Q3.** The electrochemical theory of corrosion is based on:
   A) Acid-base reactions
   B) Redox reactions
   C) Decomposition
   D) Polymerization
   ✅ Correct Answer: B
4. **Q4.** In electrochemical corrosion, the anodic reaction is:
   A) Reduction
   B) Oxidation
   C) Precipitation
   D) Neutralization
   ✅ Correct Answer: B
5. **Q5.** Which metal is protected from corrosion by a thin oxide layer?
   A) Iron
   B) Copper
   C) Zinc
   D) Aluminium
   ✅ Correct Answer: D
6. **Q6.** Galvanization is:
   A) Coating iron with copper
   B) Coating iron with zinc
   C) Coating iron with tin
   D) Electroplating iron with chromium
   ✅ Correct Answer: B
7. **Q7.** The presence of moisture and oxygen is essential for:
   A) Electroplating
   B) Corrosion
   C) Polymerization
   D) Combustion
   ✅ Correct Answer: B
8. **Q8.** Which of the following is an anodic protection method?
   A) Galvanization
   B) Cathodic protection
   C) Sacrificial anode
   D) Making metal itself the anode
   ✅ Correct Answer: D

9. **Q9.** The metal used as a sacrificial anode is:
   A) Gold
   B) Copper
   C) Zinc
   D) Iron
   ✅ Correct Answer: C
10. **Q10.** Pitting corrosion occurs due to:
   A) Uniform attack
   B) Localized breakdown of passivity
   C) Atmospheric moisture
   D) Alkaline medium
   ✅ Correct Answer: B
11. **Q11.** In cathodic protection, the protected metal acts as:
   A) Anode
   B) Cathode
   C) Neutral electrode
   D) Salt bridge
   ✅ Correct Answer: B
12. **Q12.** The common example of galvanic corrosion is:
   A) Rusting of iron
   B) Corrosion of zinc
   C) Iron pipe connected to copper
   D) Corrosion of copper
   ✅ Correct Answer: C
13. **Q13.** The rate of corrosion increases with:
   A) Decrease in temperature
   B) Increase in pH
   C) Increase in humidity
   D) Absence of air
   ✅ Correct Answer: C
14. **Q14.** The electrolyte in electrochemical corrosion is generally:
   A) Oil
   B) Acid or salt solution
   C) Alcohol
   D) Petrol
   ✅ Correct Answer: B
15. **Q15.** Protective coatings prevent corrosion by:
   A) Reacting with moisture
   B) Allowing oxygen flow
   C) Blocking contact with air and water
   D) Enhancing reactivity
   ✅ Correct Answer: C

16. **Q16.** Corrosion of metals is an example of:
    A) Physical change
    B) Chemical change
    C) Nuclear change
    D) Mechanical wear
    ✅ Correct Answer: B
17. **Q17.** Stainless steel is corrosion-resistant because it contains:
    A) Nickel
    B) Carbon
    C) Chromium
    D) Lead
    ✅ Correct Answer: C
18. **Q18.** The formation of rust is due to:
    A) CO_2 and moisture
    B) SO_2 and O_2
    C) O_2 and moisture
    D) N_2 and water
    ✅ Correct Answer: C
19. **Q19.** The function of primer in painting is to:
    A) Increase surface roughness
    B) Enhance corrosion
    C) Improve adhesion and protect the surface
    D) React with base metal
    ✅ Correct Answer: C
20. **Q20.** Which of the following is **not** a method to prevent corrosion?
    A) Painting
    B) Lubrication
    C) Scratching
    D) Galvanizing
    ✅ Correct Answer: C
21. **Q21.** The method of protecting a metal by coating with another metal that is more anodic is called:
    A) Anodizing
    B) Galvanizing
    C) Electroplating
    D) Sacrificial coating
    ✅ Correct Answer: D
22. **Q22.** Dry corrosion is also called:
    A) Electrochemical corrosion
    B) Atmospheric corrosion
    C) Oxidation corrosion

D) Galvanic corrosion

✅ Correct Answer: C

23. **Q23.** Which factor does **not** affect the rate of corrosion?
    A) Temperature
    B) Pressure
    C) Humidity
    D) Metal purity
    ✅ Correct Answer: B
24. **Q24.** Corrosion is most severe in:
    A) Cold dry air
    B) Vacuum
    C) Hot and humid air
    D) Pure oxygen
    ✅ Correct Answer: C
25. **Q25.** Which one is **not** a form of corrosion?
    A) Pitting
    B) Galvanic
    C) Cathodic
    D) Stress corrosion
    ✅ Correct Answer: C
26. **Q26.** The oxide layer on aluminium is:
    A) Soluble in water
    B) Soft and flaky
    C) Hard and protective
    D) Corrosive
    ✅ Correct Answer: C
27. **Q27.** The corrosion between two dissimilar metals in contact is:
    A) Uniform corrosion
    B) Galvanic corrosion
    C) Intergranular corrosion
    D) Pitting corrosion
    ✅ Correct Answer: B
28. **Q28.** Cathodic protection is **not** used in:
    A) Pipelines
    B) Water tanks
    C) Ship hulls
    D) Wooden furniture
    ✅ Correct Answer: D
29. **Q29.** Which type of corrosion is specific to welded joints?
    A) Galvanic
    B) Stress corrosion
    C) Intergranular corrosion

D) Erosion corrosion

✅ Correct Answer: C

30. **Q30.** Zinc protects iron by:
    A) Forming a passive layer
    B) Acting as a cathode
    C) Acting as an anode
    D) Blocking water
    ✅ Correct Answer: C
31. **Q31.** The metal which does **not** corrode easily:
    A) Iron
    B) Copper
    C) Zinc
    D) Platinum
    ✅ Correct Answer: D
32. **Q32.** Anodic protection is effective when metal forms:
    A) Volatile oxide
    B) Passive oxide layer
    C) Chloride
    D) Sulphide
    ✅ Correct Answer: B
33. **Q33.** A small anodic area and large cathodic area cause:
    A) Less corrosion
    B) No corrosion
    C) Severe corrosion
    D) Passivation
    ✅ Correct Answer: C
34. **Q34.** Which environment accelerates corrosion?
    A) Dry air
    B) Acidic medium
    C) Basic medium
    D) Vacuum
    ✅ Correct Answer: B
35. **Q35.** In galvanic series, metals higher in the series are:
    A) Noble
    B) Anodic
    C) Cathodic
    D) Protected
    ✅ Correct Answer: B
36. **Q36.** The most effective way to prevent underground pipe corrosion is:
    A) Painting
    B) Cathodic protection
    C) Coating with tar

D) Wrapping with plastic

✅ Correct Answer: B

37. **Q37.** Which corrosion involves mechanical force?
    A) Pitting
    B) Stress corrosion
    C) Galvanic
    D) Erosion
    ✅ Correct Answer: B
38. **Q38.** In sacrificial protection, the protected metal is:
    A) Oxidized
    B) Cathodic
    C) Anodic
    D) Alloyed
    ✅ Correct Answer: B
39. **Q39.** The oxide layer in dry corrosion is protective if it is:
    A) Porous
    B) Thick
    C) Volatile
    D) Non-porous and adherent
    ✅ Correct Answer: D
40. **Q40.** Which medium is best for corrosion resistance of stainless steel?
    A) Strong acid
    B) Neutral salt
    C) Alkaline
    D) Vacuum
    ✅ Correct Answer: D
41. **Q41.** Corrosion of silver is commonly called:
    A) Blackening
    B) Rusting
    C) Tinning
    D) Galvanizing
    ✅ Correct Answer: A
42. **Q42.** The major disadvantage of cathodic protection is:
    A) It causes corrosion
    B) It is expensive
    C) It requires painting
    D) It is slow
    ✅ Correct Answer: B
43. **Q43.** Galvanic corrosion is prevented by:
    A) Applying stress
    B) Keeping metals dry
    C) Electrically insulating the two metals

D) Heating the metals

✅ Correct Answer: C

44. **Q44.** Rusting of iron occurs faster in:
    A) Pure water
    B) Salt water
    C) Dry air
    D) Vacuum
    ✅ Correct Answer: B
45. **Q45.** Which of these is **not** a corrosion prevention technique?
    A) Anodizing
    B) Galvanizing
    C) Corrosion test
    D) Painting
    ✅ Correct Answer: C
46. **Q46.** Electrochemical corrosion does **not** occur in:
    A) Moist air
    B) Salt water
    C) Dry vacuum
    D) Acid solution
    ✅ Correct Answer: C
47. **Q47.** The metal with highest corrosion resistance is:
    A) Gold
    B) Aluminium
    C) Zinc
    D) Copper
    ✅ Correct Answer: A
48. **Q48.** Corrosion of metals is accelerated by:
    A) High purity
    B) Impurities
    C) High density
    D) Low density
    ✅ Correct Answer: B
49. **Q49.** Corrosion which forms holes in metal surfaces is:
    A) Uniform corrosion
    B) Pitting corrosion
    C) Galvanic corrosion
    D) Dry corrosion
    ✅ Correct Answer: B
50. **Q50.** Rust formation requires:
    A) O_2 only
    B) Moisture only
    C) Both O_2 and moisture

D) Sunlight

✅ Correct Answer: C

51. **Q51.** Corrosion of metals can be minimized by:
    A) Increasing temperature
    B) Using impure metal
    C) Coating with inert materials
    D) Immersing in acid
    ✅ Correct Answer: C
52. **Q52.** Which of the following acts as a cathodic inhibitor?
    A) Zinc oxide
    B) Sodium sulphide
    C) Sodium chromate
    D) Calcium carbonate
    ✅ Correct Answer: C
53. **Q53.** Which method improves corrosion resistance of aluminium?
    A) Galvanizing
    B) Anodizing
    C) Tinning
    D) Electroplating
    ✅ Correct Answer: B
54. **Q54.** Crevice corrosion is a type of:
    A) Uniform corrosion
    B) Localized corrosion
    C) Dry corrosion
    D) Intergranular corrosion
    ✅ Correct Answer: B
55. **Q55.** Electrochemical corrosion occurs when:
    A) Two dissimilar metals are in contact in a moist medium
    B) The metal is heated
    C) The metal is in a vacuum
    D) The metal is under mechanical stress
    ✅ Correct Answer: A
56. **Q56.** Which is an example of stress corrosion cracking?
    A) Iron rusting in air
    B) Aluminium breaking under tension in saltwater
    C) Steel in dry air
    D) Zinc in vacuum
    ✅ Correct Answer: B
57. **Q57.** Which is **not** a physical method of corrosion protection?
    A) Painting
    B) Coating with grease
    C) Galvanic protection

D) Electroplating

✅ Correct Answer: C

58. **Q58.** A metal with passive film exhibits:
    A) Increased reactivity
    B) Increased corrosion
    C) Decreased corrosion
    D) No oxidation
    ✅ Correct Answer: C
59. **Q59.** Which one is a non-corrosive environment?
    A) Acidic
    B) Alkaline
    C) Dry and oxygen-free
    D) Saline
    ✅ Correct Answer: C
60. **Q60.** Tin coating is mainly used for:
    A) Decoration
    B) Making metal magnetic
    C) Food containers
    D) Conductivity
    ✅ Correct Answer: C
61. **Q61.** The anodic area in corrosion is the region of:
    A) Electron gain
    B) Electron loss
    C) Salt deposition
    D) Moisture absorption
    ✅ Correct Answer: B
62. **Q62.** Corrosion can be prevented by cathodic protection using:
    A) Copper
    B) Zinc
    C) Platinum
    D) Mercury
    ✅ Correct Answer: B
63. **Q63.** Electrochemical corrosion leads to:
    A) Increase in mass
    B) Cracks
    C) Metal dissolution
    D) Glossy finish
    ✅ Correct Answer: C
64. **Q64.** Which oxide layer is porous and non-protective?
    A) Al_2O_3
    B) Fe_2O_3
    C) Cr_2O_3

D) TiO_2

✅ Correct Answer: B

65. **Q65.** Oxidation corrosion occurs in:
    A) Dry gases
    B) Moist air
    C) Saline water
    D) Acid solution
    ✅ Correct Answer: A
66. **Q66.** Which metal corrodes the fastest?
    A) Platinum
    B) Zinc
    C) Copper
    D) Gold
    ✅ Correct Answer: B
67. **Q67.** The corrosion in water tanks is prevented by:
    A) Painting with enamel
    B) Adding acid
    C) Leaving them open
    D) Using uncoated steel
    ✅ Correct Answer: A
68. **Q68.** Zinc is used in sacrificial protection due to its:
    A) Cathodic nature
    B) Low melting point
    C) Anodic nature
    D) Silver-like appearance
    ✅ Correct Answer: C
69. **Q69.** The product of corrosion in copper is:
    A) White precipitate
    B) Red rust
    C) Green layer (patina)
    D) Black soot
    ✅ Correct Answer: C
70. **Q70.** In electrochemical corrosion, current flows through:
    A) Metal only
    B) Air only
    C) Electrolyte and metal
    D) Insulator
    ✅ Correct Answer: C
71. **Q71.** The rate of corrosion is higher in:
    A) Cold water
    B) Deionized water
    C) Salt water

D) Distilled water

✅ Correct Answer: C

72. **Q72.** The pH range that accelerates corrosion is:
    A) 5–9
    B) 7–10
    C) Below 4 and above 10
    D) 6–8
    ✅ Correct Answer: C
73. **Q73.** Which of the following is **not** used as a corrosion inhibitor?
    A) Sodium nitrite
    B) Potassium dichromate
    C) Ferric chloride
    D) Sodium benzoate
    ✅ Correct Answer: C
74. **Q74.** Galvanic corrosion can occur when:
    A) Identical metals are in contact
    B) No electrolyte is present
    C) Two dissimilar metals are connected in a moist environment
    D) Metals are isolated
    ✅ Correct Answer: C
75. **Q75.** Which method offers both decorative and protective functions?
    A) Galvanizing
    B) Anodizing
    C) Tinning
    D) Soldering
    ✅ Correct Answer: B
76. **Q76.** Dry corrosion is slower than wet corrosion because:
    A) Oxide film formation is faster
    B) Water is absent
    C) High temperature is involved
    D) No oxidation takes place
    ✅ Correct Answer: B
77. **Q77.** Which component does **not** promote corrosion?
    A) NaCl
    B) HCl
    C) CO_2
    D) CCl_4
    ✅ Correct Answer: D
78. **Q78.** Passive metals form:
    A) Reactive oxides
    B) Thick, non-adherent oxide
    C) Protective oxide layer

D) No oxides

✅ Correct Answer: C

79. **Q79.** Which is most likely to corrode in air?
    A) Silver
    B) Iron
    C) Aluminium
    D) Chromium
    ✅ Correct Answer: B
80. **Q80.** The first step in electrochemical corrosion is:
    A) Oxide film formation
    B) Formation of galvanic cell
    C) Metal dissolution
    D) Electrolysis
    ✅ Correct Answer: B
81. **Q81.** In a corrosion cell, the flow of electrons is from:
    A) Cathode to anode
    B) Anode to cathode
    C) Metal to electrolyte
    D) Salt to metal
    ✅ Correct Answer: B
82. **Q82.** The greenish coating on copper utensils is due to:
    A) Iron oxide
    B) Cuprous sulphate
    C) Copper carbonate
    D) Zinc oxide
    ✅ Correct Answer: C
83. **Q83.** Which alloy offers better corrosion resistance?
    A) Steel
    B) Brass
    C) Stainless steel
    D) Bronze
    ✅ Correct Answer: C
84. **Q84.** Which factor is **least** likely to influence corrosion rate?
    A) Temperature
    B) Surface area
    C) Colour of metal
    D) Impurities
    ✅ Correct Answer: C
85. **Q85.** Electrochemical corrosion is due to:
    A) Physical stress
    B) Air pressure
    C) Redox reaction

D) Magnetism

✅ Correct Answer: C

86. **Q86.** Which is **not** a preventive coating?
A) Paint
B) Varnish
C) Rust
D) Grease
✅ Correct Answer: C

87. **Q87.** High purity metals corrode:
A) Faster
B) Slower
C) Uncontrollably
D) Similarly as impure
✅ Correct Answer: B

88. **Q88.** Corrosion fatigue occurs due to:
A) Constant temperature
B) Alternate stress and corrosive medium
C) Wet air only
D) Vibration only
✅ Correct Answer: B

89. **Q89.** Chromium protects iron by:
A) Flaking off
B) Forming a stable oxide film
C) Dissolving in water
D) Acting as a cathode
✅ Correct Answer: B

90. **Q90.** What accelerates galvanic corrosion?
A) Insulation
B) Dry air
C) Large potential difference
D) Coating both metals
✅ Correct Answer: C

91. **Q91.** Which gas increases corrosion in water?
A) O_2
B) CO_2
C) N_2
D) H_2
✅ Correct Answer: B

92. **Q92.** The oxide of which metal is amphoteric and forms a protective layer?
A) Al
B) Fe
C) Cu

D) Zn

✅ Correct Answer: A

93. **Q93.** When iron corrodes, it forms:
    A) FeO
    B) $Fe_2O_3 \cdot xH_2O$
    C) $FeSO_4$
    D) $FeCl_3$
    ✅ Correct Answer: B
94. **Q94.** Which component is used in sacrificial protection?
    A) Carbon
    B) Zinc
    C) Nickel
    D) Tin
    ✅ Correct Answer: B
95. **Q95.** Which of the following coatings is **not** protective?
    A) Rust
    B) Paint
    C) Plastic
    D) Varnish
    ✅ Correct Answer: A
96. **Q96.** Passive metals resist corrosion due to:
    A) High reactivity
    B) Absence of ions
    C) Protective oxide layer
    D) Thin crystalline surface
    ✅ Correct Answer: C
97. **Q97.** Moist air promotes corrosion by:
    A) Oxidation only
    B) Acting as electrolyte
    C) Providing carbon
    D) Enhancing surface finish
    ✅ Correct Answer: B
98. **Q98.** Corrosion that occurs under a coating due to trapped moisture is called:
    A) Pitting
    B) Underfilm corrosion
    C) Galvanic corrosion
    D) Atmospheric corrosion
    ✅ Correct Answer: B
99. **Q99.** Which one is **not** an alloy used for corrosion resistance?
    A) Stainless steel
    B) Brass
    C) Cast iron

D) Bronze

✅ Correct Answer: C

100. **Q100.** The most cost-effective method of corrosion prevention in household use is:

A) Anodizing

B) Painting

C) Electroplating

D) Cathodic protection

✅ Correct Answer: B

Chapter 8: Polymers

1. **Q1.** The small repeating units in a polymer are called:

A) Atoms

B) Monomers

C) Isomers

D) Polysaccharides

✅ Correct Answer: B

2. **Q2.** Which of the following is a natural polymer?

A) Polyethylene

B) Nylon

C) Cellulose

D) PVC

✅ Correct Answer: C

3. **Q3.** The polymer used in making plastic bags is:

A) Polyethylene

B) Bakelite

C) Teflon

D) Nylon-6,6

✅ Correct Answer: A

4. **Q4.** The process of forming polymers from monomers is called:

A) Crystallization

B) Polymerization

C) Vulcanization

D) Hydrolysis

✅ Correct Answer: B

5. **Q5.** PVC stands for:

A) Polyvinyl Carbonate

B) Polyvinyl Chloride

C) Polyvinyl Cyanide

D) Polyvinyl Cellulose

✅ Correct Answer: B

6. **Q6.** Nylon is a type of:
   A) Natural polymer
   B) Addition polymer
   C) Condensation polymer
   D) Copolymer
   ✅ Correct Answer: C
7. **Q7.** Which is a thermosetting plastic?
   A) Polyethylene
   B) PVC
   C) Bakelite
   D) Polystyrene
   ✅ Correct Answer: C
8. **Q8.** The raw material for synthetic rubber is:
   A) Butadiene
   B) Ethylene
   C) Benzene
   D) Propylene
   ✅ Correct Answer: A
9. **Q9.** Which is an example of an elastomer?
   A) Bakelite
   B) Teflon
   C) Natural rubber
   D) PVC
   ✅ Correct Answer: C
10. **Q10.** Teflon is a polymer of:
    A) Tetrafluoroethylene
    B) Vinyl chloride
    C) Styrene
    D) Ethylene
    ✅ Correct Answer: A
11. **Q11.** Which of the following is **not** a property of thermoplastics?
    A) Soften on heating
    B) Can be remolded
    C) Hardens permanently after molding
    D) Used in packaging
    ✅ Correct Answer: C
12. **Q12.** Polymers formed by addition reaction are called:
    A) Addition polymers
    B) Condensation polymers
    C) Co-polymers
    D) Homopolymers
    ✅ Correct Answer: A

13. **Q13.** Which is a biodegradable polymer?
    A) Nylon
    B) PHBV
    C) PVC
    D) Teflon
    ✅ Correct Answer: B
14. **Q14.** Buna-S is a copolymer of:
    A) Butadiene and styrene
    B) Ethylene and propylene
    C) Vinyl chloride and ethylene
    D) Benzene and ethylene
    ✅ Correct Answer: A
15. **Q15.** A polymer formed from a single type of monomer is called:
    A) Homopolymer
    B) Copolymer
    C) Biopolymer
    D) Heteropolymer
    ✅ Correct Answer: A
16. **Q16.** Which of the following is a copolymer?
    A) Polyethylene
    B) Nylon-6
    C) Buna-N
    D) Polystyrene
    ✅ Correct Answer: C
17. **Q17.** Which polymer is used for non-stick cookware coating?
    A) Bakelite
    B) Teflon
    C) PVC
    D) Polypropylene
    ✅ Correct Answer: B
18. **Q18.** Dacron is a polymer of:
    A) Ethylene glycol and terephthalic acid
    B) Adipic acid and hexamethylene diamine
    C) Vinyl chloride
    D) Propylene
    ✅ Correct Answer: A
19. **Q19.** The monomer of natural rubber is:
    A) Butadiene
    B) Isoprene
    C) Chloroprene
    D) Styrene
    ✅ Correct Answer: B

20. **Q20.** Which synthetic fiber is known as polyester?
    A) Nylon
    B) Rayon
    C) Terylene
    D) Orlon
    ✅ Correct Answer: C
21. **Q21.** Which of the following is a thermoplastic?
    A) Bakelite
    B) Melamine
    C) PVC
    D) Urea-formaldehyde
    ✅ Correct Answer: C
22. **Q22.** The polymer of vinyl chloride is:
    A) PVC
    B) Polyacrylonitrile
    C) Polystyrene
    D) Polypropylene
    ✅ Correct Answer: A
23. **Q23.** Which is not used as a monomer for synthetic rubber?
    A) Isoprene
    B) Chloroprene
    C) Styrene
    D) Ethylene glycol
    ✅ Correct Answer: D
24. **Q24.** Which of the following is used in making electrical insulators?
    A) Teflon
    B) Bakelite
    C) PVC
    D) Nylon
    ✅ Correct Answer: B
25. **Q25.** Rayon is obtained from:
    A) Petroleum
    B) Wood pulp
    C) Natural gas
    D) Coal
    ✅ Correct Answer: B
26. **Q26.** Which polymer is used for making bulletproof glass?
    A) Polyvinyl chloride
    B) Polycarbonate
    C) Polystyrene
    D) Polypropylene
    ✅ Correct Answer: B

27. **Q27.** Which of the following polymers is water soluble?
    A) Polyvinyl alcohol
    B) Polyethylene
    C) Teflon
    D) Bakelite
    ✅ Correct Answer: A
28. **Q28.** The process of strengthening rubber by heating with sulfur is called:
    A) Polymerization
    B) Vulcanization
    C) Condensation
    D) Cross-linking
    ✅ Correct Answer: B
29. **Q29.** Which is a condensation polymer?
    A) Polyethylene
    B) Nylon-6,6
    C) PVC
    D) Polystyrene
    ✅ Correct Answer: B
30. **Q30.** Polypropylene is obtained by the polymerization of:
    A) Ethylene
    B) Propylene
    C) Butadiene
    D) Styrene
    ✅ Correct Answer: B
31. **Q31.** Teflon is known for its:
    A) High electrical conductivity
    B) Stickiness
    C) Resistance to heat and chemicals
    D) Transparency
    ✅ Correct Answer: C
32. **Q32.** Orlon is a polymer of:
    A) Acrylonitrile
    B) Styrene
    C) Ethylene
    D) Propylene
    ✅ Correct Answer: A
33. **Q33.** Which of the following is used in the textile industry?
    A) PVC
    B) Bakelite
    C) Nylon
    D) Polystyrene
    ✅ Correct Answer: C

34. **Q34.** Polymers having high elasticity are known as:
    A) Thermoplastics
    B) Elastomers
    C) Fibers
    D) Thermosets
    ✅ Correct Answer: B
35. **Q35.** Which is an example of a fiber polymer?
    A) Nylon
    B) Rubber
    C) PVC
    D) Teflon
    ✅ Correct Answer: A
36. **Q36.** The repeating unit in polyethylene is:
    A) $-CH_2-CH_2-$
    B) $-CH=CH-$
    C) $-CH_2-CHCl-$
    D) $-C_6H_5-CH=CH_2-$
    ✅ Correct Answer: A
37. **Q37.** Which polymer is used in making ropes and fishing nets?
    A) Bakelite
    B) Nylon
    C) PVC
    D) Polystyrene
    ✅ Correct Answer: B
38. **Q38.** Which of the following is a synthetic fiber?
    A) Silk
    B) Wool
    C) Nylon
    D) Cotton
    ✅ Correct Answer: C
39. **Q39.** Glyptal is formed by the polymerization of:
    A) Ethylene glycol and phthalic acid
    B) Ethylene and benzene
    C) Propylene and formaldehyde
    D) Styrene and ethylene
    ✅ Correct Answer: A
40. **Q40.** In step-growth polymerization, polymers are formed by:
    A) Elimination of small molecules
    B) Addition of radicals
    C) Electrophilic substitution
    D) Redox reactions
    ✅ Correct Answer: A

41. **Q41.** The type of bonding in polymers is:
    A) Metallic
    B) Ionic
    C) Covalent
    D) Hydrogen
    ✅ Correct Answer: C
42. **Q42.** What is the major use of polystyrene?
    A) Pipes
    B) Packing materials
    C) Ropes
    D) Coatings
    ✅ Correct Answer: B
43. **Q43.** Which polymer is used in insulation of wires?
    A) Nylon
    B) PVC
    C) Bakelite
    D) Polyester
    ✅ Correct Answer: B
44. **Q44.** Bakelite is prepared from:
    A) Phenol and formaldehyde
    B) Ethylene and glycol
    C) Benzene and ethylene
    D) Butadiene and styrene
    ✅ Correct Answer: A
45. **Q45.** Which of the following is a linear polymer?
    A) Nylon
    B) Bakelite
    C) Teflon
    D) Melamine
    ✅ Correct Answer: A
46. **Q46.** Which of the following is not a synthetic polymer?
    A) Nylon
    B) Polyester
    C) Silk
    D) Polypropylene
    ✅ Correct Answer: C
47. **Q47.** The repeating unit in nylon-6 is derived from:
    A) Caprolactam
    B) Terephthalic acid
    C) Adipic acid
    D) Ethylene glycol
    ✅ Correct Answer: A

48. **Q48.** The common initiator used in free radical polymerization is:
    A) Benzoyl peroxide
    B) Sulfur dioxide
    C) Sodium chloride
    D) Formaldehyde
    ✅ Correct Answer: A
49. **Q49.** Which type of polymer is polystyrene?
    A) Condensation
    B) Addition
    C) Co-polymer
    D) Natural
    ✅ Correct Answer: B
50. **Q50.** The synthetic polymer used for making non-breakable crockery is:
    A) Melamine
    B) Nylon
    C) PVC
    D) Polyester
    ✅ Correct Answer: A
51. **Q51.** Which polymer is used in making contact lenses?
    A) PVC
    B) Polyvinyl alcohol
    C) Polyacrylamide
    D) Polymethyl methacrylate (PMMA)
    ✅ Correct Answer: D
52. **Q52.** Which polymer is known as acrylic?
    A) Polypropylene
    B) Polystyrene
    C) Polyacrylonitrile
    D) Polyamide
    ✅ Correct Answer: C
53. **Q53.** The plastic used in making toys and combs is:
    A) Nylon
    B) Bakelite
    C) Polystyrene
    D) Teflon
    ✅ Correct Answer: C
54. **Q54.** Which of the following has the highest tensile strength?
    A) Polypropylene
    B) Nylon
    C) Polyethylene
    D) PVC
    ✅ Correct Answer: B

55. **Q55.** Which of the following is not used in the manufacture of synthetic rubber?
    A) Chloroprene
    B) Butadiene
    C) Styrene
    D) Ethene
    ✅ Correct Answer: D
56. **Q56.** Which polymer is formed by condensation of hexamethylene diamine and adipic acid?
    A) Nylon-6
    B) Nylon-6,6
    C) Terylene
    D) Polyester
    ✅ Correct Answer: B
57. **Q57.** Melamine-formaldehyde polymer is:
    A) Thermoplastic
    B) Thermosetting
    C) Elastomer
    D) Fiber
    ✅ Correct Answer: B
58. **Q58.** Which polymer is used in non-drip paints?
    A) Teflon
    B) Polyurethane
    C) Polyacrylamide
    D) PVC
    ✅ Correct Answer: B
59. **Q59.** Which polymer is used in adhesives and coatings?
    A) Polystyrene
    B) Polyvinyl acetate (PVA)
    C) PVC
    D) Nylon
    ✅ Correct Answer: B
60. **Q60.** The synthetic polymer with a wide range of medical applications is:
    A) Polypropylene
    B) Polyurethane
    C) PMMA
    D) Nylon
    ✅ Correct Answer: C
61. **Q61.** Which is a biodegradable polymer?
    A) Teflon
    B) Nylon-6
    C) PHBV

D) PVC

✅ Correct Answer: C

62. **Q62.** The characteristic feature of elastomers is:
    A) High crystallinity
    B) Cross-linking
    C) Low elasticity
    D) High melting point
    ✅ Correct Answer: B
63. **Q63.** Which polymer has the structure of repeated ester linkages?
    A) Nylon
    B) PVC
    C) Terylene
    D) Polystyrene
    ✅ Correct Answer: C
64. **Q64.** The polymer used in manufacturing gears and bearings is:
    A) Nylon
    B) Teflon
    C) Bakelite
    D) Polypropylene
    ✅ Correct Answer: A
65. **Q65.** Which of the following is a fiber-forming polymer?
    A) Polystyrene
    B) PVC
    C) Terylene
    D) Teflon
    ✅ Correct Answer: C
66. **Q66.** The polymer obtained from lactic acid is:
    A) Polyamide
    B) Polylactic acid (PLA)
    C) PVC
    D) Polyvinyl alcohol
    ✅ Correct Answer: B
67. **Q67.** The polymer resistant to acid and base is:
    A) PVC
    B) Nylon
    C) Teflon
    D) Polyester
    ✅ Correct Answer: C
68. **Q68.** Which polymer is used in foam mattresses?
    A) Polyurethane
    B) PVC
    C) Nylon

D) Polystyrene

✅ Correct Answer: A

69. **Q69.** What is the function of sulfur in vulcanization?
    A) Softens rubber
    B) Enhances elasticity
    C) Forms cross-links
    D) Increases adhesiveness
    ✅ Correct Answer: C
70. **Q70.** Which polymer is widely used in packaging?
    A) Bakelite
    B) Polyethylene
    C) Nylon
    D) Terylene
    ✅ Correct Answer: B
71. **Q71.** Which of the following is not an elastomer?
    A) Buna-S
    B) Neoprene
    C) Natural rubber
    D) Terylene
    ✅ Correct Answer: D
72. **Q72.** Which is a linear condensation polymer?
    A) Nylon-6,6
    B) PVC
    C) Polystyrene
    D) Polypropylene
    ✅ Correct Answer: A
73. **Q73.** The monomer of polyester is:
    A) Adipic acid
    B) Caprolactam
    C) Ethylene glycol and terephthalic acid
    D) Acrylic acid
    ✅ Correct Answer: C
74. **Q74.** Which polymer is used in bulletproof vests?
    A) Kevlar
    B) Nylon
    C) Teflon
    D) PVC
    ✅ Correct Answer: A
75. **Q75.** The polymer of chloroprene is:
    A) Neoprene
    B) Nylon
    C) PVC

D) Buna-S

✅ Correct Answer: A

76. **Q76.** Polymerization of styrene yields:
    A) Polystyrene
    B) Polyester
    C) Polypropylene
    D) Polyvinyl chloride
    ✅ Correct Answer: A
77. **Q77.** Which of the following is a cross-linked polymer?
    A) Bakelite
    B) PVC
    C) Polystyrene
    D) Nylon
    ✅ Correct Answer: A
78. **Q78.** Which polymer is used in paints and varnishes?
    A) Glyptal
    B) Teflon
    C) PVC
    D) Nylon
    ✅ Correct Answer: A
79. **Q79.** The monomer of Orlon is:
    A) Acrylonitrile
    B) Terephthalic acid
    C) Caprolactam
    D) Formaldehyde
    ✅ Correct Answer: A
80. **Q80.** What type of polymer is Nylon-6?
    A) Addition
    B) Condensation
    C) Elastomer
    D) Thermosetting
    ✅ Correct Answer: B
81. **Q81.** Which polymer is used for making containers and bottles?
    A) Polyethylene terephthalate (PET)
    B) PVC
    C) Teflon
    D) Nylon
    ✅ Correct Answer: A
82. **Q82.** Which is used as an antiknock additive and is a polymer?
    A) Tetraethyl lead
    B) Polyisobutene
    C) Butadiene

D) PVC

✅ Correct Answer: B

83. **Q83.** Natural rubber is a polymer of:
    A) 1,3-Butadiene
    B) 2-Methyl-1,3-butadiene
    C) Vinyl chloride
    D) Propene
    ✅ Correct Answer: B
84. **Q84.** Which polymer is used in recording tapes?
    A) Terylene
    B) Bakelite
    C) Glyptal
    D) Polycarbonate
    ✅ Correct Answer: A
85. **Q85.** Which polymer is a polyamide?
    A) Nylon
    B) Polyester
    C) PVC
    D) Polystyrene
    ✅ Correct Answer: A
86. **Q86.** What is the use of polyaniline?
    A) Synthetic fiber
    B) Conducting polymer
    C) Plasticizer
    D) Insulating material
    ✅ Correct Answer: B
87. **Q87.** Which polymer is biodegradable?
    A) Nylon
    B) PVC
    C) PHBV
    D) Teflon
    ✅ Correct Answer: C
88. **Q88.** The monomer of Teflon is:
    A) Tetrafluoroethylene
    B) Vinyl fluoride
    C) Styrene
    D) Ethylene
    ✅ Correct Answer: A
89. **Q89.** Which polymer is used for light-weight, transparent lenses?
    A) Nylon
    B) PMMA
    C) PVC

D) Polystyrene

✅ Correct Answer: B

90. **Q90.** Which polymer is resistant to attack by acids and alkalis?
    A) Nylon
    B) PVC
    C) Teflon
    D) Polyester
    ✅ Correct Answer: C
91. **Q91.** Which polymer is used for making ropes?
    A) Terylene
    B) Nylon-6
    C) Bakelite
    D) PMMA
    ✅ Correct Answer: B
92. **Q92.** Which polymer is used in flame-resistant fabrics?
    A) Melamine
    B) PVC
    C) Nylon
    D) Polyethylene
    ✅ Correct Answer: A
93. **Q93.** Polystyrene is obtained from:
    A) Benzene
    B) Toluene
    C) Styrene
    D) Ethylene
    ✅ Correct Answer: C
94. **Q94.** Which polymer is known as artificial silk?
    A) Nylon
    B) Rayon
    C) Polyester
    D) PVC
    ✅ Correct Answer: B
95. **Q95.** Neoprene is a polymer of:
    A) Butadiene
    B) Isoprene
    C) Chloroprene
    D) Styrene
    ✅ Correct Answer: C
96. **Q96.** Which polymer is used in making gears and bearings?
    A) Bakelite
    B) Nylon
    C) PMMA

D) Teflon

✅ Correct Answer: B

97. **Q97.** A monomer of Buna-S rubber is:
A) Styrene
B) Ethylene
C) Vinyl chloride
D) Propylene
✅ Correct Answer: A

98. **Q98.** Polymerization of ethylene gives:
A) PVC
B) Polypropylene
C) Polyethylene
D) Polystyrene
✅ Correct Answer: C

99. **Q99.** Which of the following is not an addition polymer?
A) PVC
B) Teflon
C) Nylon-6
D) Polystyrene
✅ Correct Answer: C

100. **Q100.** Which polymer is used for carpet fibers?
A) Polypropylene
B) Polycarbonate
C) PVC
D) PMMA
✅ Correct Answer: A

Chapter 9: Fuels

1. **Q1.** Which of the following is a primary fuel?
A) Petrol
B) Diesel
C) Coal

D) Kerosene

✅ **Correct Answer: C**

2. **Q2.** Which gas is used as a domestic fuel?
   A) Hydrogen
   B) Methane
   C) Ethane
   D) Butane
   ✅ **Correct Answer: D**
3. **Q3.** Calorific value of a fuel is expressed in:
   A) J/kg
   B) kJ/kg
   C) kcal/mol
   D) kWh
   ✅ **Correct Answer: B**
4. **Q4.** CNG stands for:
   A) Compressed Nitrogen Gas
   B) Compressed Natural Gas
   C) Cold Natural Gas
   D) Compressed Neutral Gas
   ✅ **Correct Answer: B**
5. **Q5.** Which of the following is the cleanest fuel?
   A) Diesel
   B) Petrol
   C) Hydrogen
   D) Kerosene
   ✅ **Correct Answer: C**
6. **Q6.** Which fuel has the highest calorific value?
   A) Coal
   B) Hydrogen
   C) Petrol
   D) LPG
   ✅ **Correct Answer: B**
7. **Q7.** Which is a non-renewable source of energy?
   A) Wind
   B) Solar
   C) Petroleum
   D) Tidal
   ✅ **Correct Answer: C**
8. **Q8.** Biogas mainly contains:
   A) Ethane
   B) Butane
   C) Methane

D) Propane

✅ **Correct Answer: C**

9. **Q9.** Which fuel is used in rockets?
   A) Petrol
   B) Kerosene
   C) Liquid Hydrogen
   D) LPG

   ✅ **Correct Answer: C**

10. **Q10.** Petrol is obtained by:
    A) Cracking of natural gas
    B) Fractional distillation of crude oil
    C) Fermentation of biomass
    D) Electrolysis of water

    ✅ **Correct Answer: B**

11. **Q11.** Which of the following is a fossil fuel?
    A) Biogas
    B) Hydrogen
    C) Natural Gas
    D) Ethanol

    ✅ **Correct Answer: C**

12. **Q12.** The process of breaking large hydrocarbon molecules into smaller ones is called:
    A) Polymerization
    B) Oxidation
    C) Cracking
    D) Refining

    ✅ **Correct Answer: C**

13. **Q13.** Octane number is related to:
    A) Kerosene quality
    B) Petrol quality
    C) Diesel quality
    D) LPG quality

    ✅ **Correct Answer: B**

14. **Q14.** Which of the following is used as a fuel in automobiles?
    A) Water
    B) LPG
    C) Oxygen
    D) Helium

    ✅ **Correct Answer: B**

15. **Q15.** Diesel is used in:
    A) Petrol engines
    B) Jet engines
    C) Diesel engines

D) Rocket engines

✅ **Correct Answer: C**

16. **Q16.** Which of the following is not a fuel?
    A) Coal
    B) Kerosene
    C) Oxygen
    D) LPG

    ✅ **Correct Answer: C**

17. **Q17.** Which of the following fuels is used in rural areas for cooking?
    A) Electricity
    B) Diesel
    C) Biogas
    D) Petrol

    ✅ **Correct Answer: C**

18. **Q18.** LPG is a mixture of:
    A) Methane and Ethane
    B) Butane and Propane
    C) Hydrogen and Oxygen
    D) Carbon dioxide and Methane

    ✅ **Correct Answer: B**

19. **Q19.** Which fuel emits the least pollutants?
    A) Petrol
    B) Diesel
    C) LPG
    D) Coal

    ✅ **Correct Answer: C**

20. **Q20.** The main source of fuel for thermal power plants is:
    A) Uranium
    B) Water
    C) Coal
    D) Wind

    ✅ **Correct Answer: C**

21. **Q21.** The major component of natural gas is:
    A) Butane
    B) Ethane
    C) Methane
    D) Propane

    ✅ **Correct Answer: C**

22. **Q22.** Which fuel is obtained from anaerobic decomposition of organic matter?
    A) Petrol
    B) Biogas
    C) Diesel

D) LPG

✅ **Correct Answer: B**

23. **Q23.** Which of the following is used in gas welding?
    A) Hydrogen
    B) Acetylene
    C) Oxygen
    D) Propane

    ✅ **Correct Answer: B**

24. **Q24.** What is the unit of calorific value?
    A) J/s
    B) kJ
    C) kJ/kg
    D) kg/kJ

    ✅ **Correct Answer: C**

25. **Q25.** Which of the following is a secondary fuel?
    A) Wood
    B) Coal
    C) Petrol
    D) Biogas

    ✅ **Correct Answer: C**

26. **Q26.** The fuel used in jet engines is:
    A) Diesel
    B) CNG
    C) Aviation Turbine Fuel
    D) Kerosene

    ✅ **Correct Answer: C**

27. **Q27.** Which fuel is formed by fermentation of sugarcane?
    A) Ethanol
    B) Methanol
    C) LPG
    D) Hydrogen

    ✅ **Correct Answer: A**

28. **Q28.** The gas commonly used in balloons and airships is:
    A) Methane
    B) Hydrogen
    C) Oxygen
    D) Helium

    ✅ **Correct Answer: D**

29. **Q29.** Which gas is least polluting when used as a fuel?
    A) Hydrogen
    B) Diesel
    C) Petrol

D) Kerosene

✅ **Correct Answer: A**

30. **Q30.** The energy released during combustion is mainly in the form of:
    A) Sound
    B) Heat
    C) Light
    D) Magnetism

    ✅ **Correct Answer: B**

31. **Q31.** Which among the following is not a characteristic of a good fuel?
    A) High calorific value
    B) High moisture content
    C) Low smoke production
    D) Easy to transport

    ✅ **Correct Answer: B**

32. **Q32.** Which of the following has the lowest calorific value?
    A) Wood
    B) Petrol
    C) Diesel
    D) Hydrogen

    ✅ **Correct Answer: A**

33. **Q33.** Which of the following is considered a renewable fuel?
    A) LPG
    B) Biogas
    C) Coal
    D) Petrol

    ✅ **Correct Answer: B**

34. **Q34.** Which of the following is a gaseous fuel?
    A) Charcoal
    B) Wood
    C) LPG
    D) Kerosene

    ✅ **Correct Answer: C**

35. **Q35.** LPG stands for:
    A) Liquid Petroleum Gas
    B) Light Propane Gas
    C) Limited Power Gas
    D) Low Pressure Gas

    ✅ **Correct Answer: A**

36. **Q36.** Producer gas is a mixture of:
    A) CO and H_2
    B) CO and N_2
    C) CH_4 and CO

D) H_2 and N_2

✅ **Correct Answer: B**

37. **Q37.** Which is a characteristic of LPG?
    A) Odorless
    B) Non-inflammable
    C) Highly compressible
    D) Green-colored gas

    ✅ **Correct Answer: C**

38. **Q38.** The knocking tendency in fuels is indicated by:
    A) Cetane number
    B) Octane number
    C) Calorific value
    D) Molecular mass

    ✅ **Correct Answer: B**

39. **Q39.** The fuel used in domestic cooking is:
    A) Kerosene
    B) Diesel
    C) LPG
    D) Petrol

    ✅ **Correct Answer: C**

40. **Q40.** Which of the following is used as a fuel in thermal power stations?
    A) Natural gas
    B) Coal
    C) Biogas
    D) Petrol

    ✅ **Correct Answer: B**

41. **Q41.** Which is an example of a liquid fuel?
    A) LPG
    B) Coal
    C) Petrol
    D) Hydrogen

    ✅ **Correct Answer: C**

42. **Q42.** The burning of fuels releases:
    A) Oxygen
    B) Carbon monoxide
    C) Carbon dioxide and heat
    D) Nitrogen

    ✅ **Correct Answer: C**

43. **Q43.** Incomplete combustion of fuels produces:
    A) Carbon dioxide
    B) Water
    C) Carbon monoxide

D) Methane

✅ **Correct Answer: C**

44. **Q44.** Which is the most efficient fuel?
    A) Wood
    B) Kerosene
    C) Diesel
    D) Hydrogen

    ✅ **Correct Answer: D**

45. **Q45.** Which of the following is not a fossil fuel?
    A) Natural gas
    B) Petrol
    C) Diesel
    D) Biogas

    ✅ **Correct Answer: D**

46. **Q46.** What is the main disadvantage of using fossil fuels?
    A) Expensive
    B) Produces harmful gases
    C) Easy to transport
    D) Renewable

    ✅ **Correct Answer: B**

47. **Q47.** Which fuel is formed by the decomposition of plant and animal remains?
    A) Ethanol
    B) Coal
    C) Biogas
    D) Methane

    ✅ **Correct Answer: B**

48. **Q48.** LPG is mainly composed of:
    A) Methane
    B) Butane and Propane
    C) Hydrogen
    D) Ethylene

    ✅ **Correct Answer: B**

49. **Q49.** Which property is desirable in an ideal fuel?
    A) Low ignition temperature
    B) High moisture content
    C) High calorific value
    D) Produces a lot of ash

    ✅ **Correct Answer: C**

50. **Q50.** Which gas is commonly used in oxygen cylinders for welding?
    A) Methane
    B) Propane
    C) Acetylene

D) Butane

✅ **Correct Answer: C**

51. **Q51.** Which of the following is a biofuel?
    A) Diesel
    B) Petrol
    C) Ethanol
    D) Kerosene

    ✅ **Correct Answer: C**

52. **Q52.** Which of the following gases is not found in biogas?
    A) Methane
    B) Hydrogen sulfide
    C) Oxygen
    D) Carbon dioxide

    ✅ **Correct Answer: C**

53. **Q53.** Which of the following is used as fuel in lighthouses?
    A) Diesel
    B) Kerosene
    C) Petrol
    D) LPG

    ✅ **Correct Answer: B**

54. **Q54.** The combustion of fuels is a:
    A) Physical change
    B) Chemical change
    C) Reversible change
    D) No change

    ✅ **Correct Answer: B**

55. **Q55.** Which is not a characteristic of CNG?
    A) Odorless
    B) Environment friendly
    C) Easy to store
    D) Non-polluting

    ✅ **Correct Answer: A**

56. **Q56.** Which fuel has the highest energy content per unit mass?
    A) Petrol
    B) Diesel
    C) Hydrogen
    D) Coal

    ✅ **Correct Answer: C**

57. **Q57.** Which of the following is not used as an industrial fuel?
    A) Coke
    B) Coal gas
    C) Water

D) Producer gas

✅ **Correct Answer: C**

58. **Q58.** Which of the following is not a form of fossil fuel?
    A) Crude oil
    B) Natural gas
    C) Coal
    D) Hydrogen
    ✅ **Correct Answer: D**
59. **Q59.** The calorific value of biogas is around:
    A) 10–15 kJ/g
    B) 30–35 kJ/g
    C) 50–55 kJ/g
    D) 5–10 kJ/g
    ✅ **Correct Answer: B**
60. **Q60.** Which fuel is used for vehicles in some cities to reduce pollution?
    A) Diesel
    B) Petrol
    C) CNG
    D) Coal
    ✅ **Correct Answer: C**
61. **Q61.** Which fuel burns with a blue flame and is considered clean?
    A) Coal
    B) Kerosene
    C) LPG
    D) Wood
    ✅ **Correct Answer: C**
62. **Q62.** Which among the following is not an advantage of LPG?
    A) Clean burning
    B) Easily portable
    C) High calorific value
    D) Produces ash
    ✅ **Correct Answer: D**
63. **Q63.** Which of the following is used in electric generators as fuel?
    A) Petrol
    B) Diesel
    C) Kerosene
    D) LPG
    ✅ **Correct Answer: B**
64. **Q64.** Petrol is primarily composed of:
    A) Methane
    B) Hydrocarbons
    C) Oxygen compounds

D) Alcohol

✅ **Correct Answer: B**

65. **Q65.** Which one is not a renewable source of energy?
    A) Solar energy
    B) Wind energy
    C) Biogas
    D) Diesel

    ✅ **Correct Answer: D**

66. **Q66.** Which property is least preferred in an ideal fuel?
    A) Produces harmful gases
    B) Easy availability
    C) High calorific value
    D) Safe storage

    ✅ **Correct Answer: A**

67. **Q67.** The process of breaking large hydrocarbon molecules into smaller ones is called:
    A) Distillation
    B) Refining
    C) Cracking
    D) Polymerization

    ✅ **Correct Answer: C**

68. **Q68.** A good fuel should have:
    A) High ignition temperature
    B) Low calorific value
    C) High calorific value
    D) High moisture content

    ✅ **Correct Answer: C**

69. **Q69.** Which is not a characteristic of fossil fuels?
    A) Formed over millions of years
    B) Renewable
    C) Polluting
    D) Non-renewable

    ✅ **Correct Answer: B**

70. **Q70.** What is added to LPG to detect leakage?
    A) Mercaptan
    B) Acetone
    C) Ethanol
    D) Methane

    ✅ **Correct Answer: A**

71. **Q71.** The flash point of a fuel is:
    A) Maximum temperature of combustion
    B) Minimum temperature to ignite
    C) Temperature of distillation

D) Boiling point

✅ **Correct Answer: B**

72. **Q72.** Which fuel is used in rockets?
    A) Petrol
    B) Hydrogen
    C) Diesel
    D) LPG

    ✅ **Correct Answer: B**

73. **Q73.** Which is a characteristic of gaseous fuels over solid fuels?
    A) Produce more ash
    B) Less calorific value
    C) Easy to handle and clean
    D) Hard to store

    ✅ **Correct Answer: C**

74. **Q74.** The fuel obtained from plant oils is:
    A) Petrol
    B) Biodiesel
    C) LPG
    D) Methane

    ✅ **Correct Answer: B**

75. **Q75.** Which is not a solid fuel?
    A) Wood
    B) Charcoal
    C) Coal
    D) Ethanol

    ✅ **Correct Answer: D**

76. **Q76.** Which of the following fuels is derived from crude oil?
    A) LPG
    B) Coal
    C) Natural gas
    D) Wood

    ✅ **Correct Answer: A**

77. **Q77.** Which energy source causes least pollution?
    A) Petrol
    B) Diesel
    C) Solar energy
    D) Coal

    ✅ **Correct Answer: C**

78. **Q78.** Which fuel is used in rural areas for cooking?
    A) LPG
    B) Diesel
    C) Biogas

D) Kerosene

✅ **Correct Answer: C**

79. **Q79.** Which property is not desirable in a domestic fuel?
    A) Safe to handle
    B) High calorific value
    C) High smoke production
    D) Low cost
    ✅ **Correct Answer: C**
80. **Q80.** Which fuel emits greenhouse gases when burned?
    A) Hydrogen
    B) Biogas
    C) Diesel
    D) Solar
    ✅ **Correct Answer: C**
81. **Q81.** Which one of these is a synthetic fuel?
    A) Biogas
    B) Coal
    C) Petrol
    D) Methanol
    ✅ **Correct Answer: D**
82. **Q82.** The calorific value of petrol is approximately:
    A) 25 kJ/g
    B) 30 kJ/g
    C) 45 kJ/g
    D) 60 kJ/g
    ✅ **Correct Answer: C**
83. **Q83.** Which of these fuels is transported via pipelines?
    A) Wood
    B) Coal
    C) Natural gas
    D) Charcoal
    ✅ **Correct Answer: C**
84. **Q84.** Which of the following has the lowest ignition temperature?
    A) Petrol
    B) Diesel
    C) Coal
    D) Wood
    ✅ **Correct Answer: A**
85. **Q85.** Petrol is obtained by:
    A) Cracking
    B) Polymerization
    C) Distillation of crude oil

D) Electrolysis

✅ **Correct Answer: C**

86. **Q86.** Which of these is considered a clean fuel?
    A) Coal
    B) Kerosene
    C) LPG
    D) Diesel
    ✅ **Correct Answer: C**
87. **Q87.** Combustion of which fuel produces water vapor and carbon dioxide only?
    A) Hydrogen
    B) Petrol
    C) Biogas
    D) Methane
    ✅ **Correct Answer: D**
88. **Q88.** Which one of these is not obtained from petroleum?
    A) Diesel
    B) Kerosene
    C) Natural gas
    D) Coal
    ✅ **Correct Answer: D**
89. **Q89.** Producer gas is a mixture of:
    A) $CO + H_2$
    B) $CO + N_2$
    C) $CO_2 + CH_4$
    D) $CO_2 + O_2$
    ✅ **Correct Answer: B**
90. **Q90.** Which component of fuel is primarily responsible for energy release?
    A) Oxygen
    B) Nitrogen
    C) Carbon
    D) Sulfur
    ✅ **Correct Answer: C**
91. **Q91.** Charcoal is prepared by heating wood:
    A) In open air
    B) In sunlight
    C) In limited supply of air
    D) Under water
    ✅ **Correct Answer: C**
92. **Q92.** Which is a non-conventional fuel source?
    A) Diesel
    B) Wind energy
    C) Kerosene

D) Coal

✅ **Correct Answer: B**

93. **Q93.** Which of these is used as an aviation fuel?
    A) LPG
    B) Kerosene
    C) Diesel
    D) Biogas

    ✅ **Correct Answer: B**

94. **Q94.** What makes CNG safer than LPG?
    A) It is heavier than air
    B) It is odorless
    C) It disperses quickly when leaked
    D) It has low calorific value

    ✅ **Correct Answer: C**

95. **Q95.** Which one is the primary source of energy on Earth?
    A) Fossil fuels
    B) Solar energy
    C) Electricity
    D) Wind

    ✅ **Correct Answer: B**

96. **Q96.** What is the main pollutant emitted by diesel engines?
    A) SO_2
    B) CO
    C) CO_2
    D) NOx

    ✅ **Correct Answer: D**

97. **Q97.** A disadvantage of hydrogen as fuel is:
    A) Low calorific value
    B) Produces CO_2
    C) Difficult storage
    D) Causes smoke

    ✅ **Correct Answer: C**

98. **Q98.** Which of the following is not a use of fuel?
    A) Transportation
    B) Cooking
    C) Construction
    D) Electricity generation

    ✅ **Correct Answer: C**

99. **Q99.** LPG is mainly used for:
    A) Generating electricity
    B) Cooking
    C) Fuel in cars

D) Rocket fuel

✅ **Correct Answer: B**

100. **Q100.** What is the ideal ignition temperature range for a domestic fuel?

A) 100–200°C

B) 200–300°C

C) 400–500°C

D) Above 600°C

✅ **Correct Answer: B**

Chapter 10: Environmental Chemistry

1. **Q1.** The major component of acid rain is:

A) HCl

B) HNO_3

C) H_2SO_4

D) CH_3COOH

✅ **Correct Answer: C**

2. **Q2.** Which of the following gases is primarily responsible for the greenhouse effect?

A) Nitrogen

B) Oxygen

C) Carbon dioxide

D) Hydrogen

✅ **Correct Answer: C**

3. **Q3.** Which gas is responsible for ozone layer depletion?

A) CO

B) SO_2

C) CFCs

D) CH_4

✅ **Correct Answer: C**

4. **Q4.** Which pollutant is most responsible for respiratory problems in humans?

A) SO_2

B) CO_2

C) N_2

D) O_2

✅ **Correct Answer: A**

5. **Q5.** The pH of acid rain is:

A) 7

B) >7

C) <7

D) 14

✅ **Correct Answer: C**

6. **Q6.** Which of the following is not a greenhouse gas?
   A) Methane
   B) Carbon dioxide
   C) Nitrogen
   D) Ozone

   ✅ **Correct Answer: C**
7. **Q7.** Which metal is most affected by acid rain?
   A) Gold
   B) Platinum
   C) Iron
   D) Silver

   ✅ **Correct Answer: C**
8. **Q8.** The ozone layer is present in which part of the atmosphere?
   A) Troposphere
   B) Mesosphere
   C) Stratosphere
   D) Thermosphere

   ✅ **Correct Answer: C**
9. **Q9.** Which of the following causes eutrophication in water bodies?
   A) Phosphates and nitrates
   B) Carbon monoxide
   C) Hydrocarbons
   D) Methane

   ✅ **Correct Answer: A**
10. **Q10.** The most harmful ultraviolet radiation for human health is:
    A) UV-A
    B) UV-B
    C) UV-C
    D) Infrared

    ✅ **Correct Answer: C**
11. **Q11.** Which of the following gases is colorless and odorless but deadly?
    A) CO
    B) CO_2
    C) O_2
    D) CH_4

    ✅ **Correct Answer: A**
12. **Q12.** Smog is a mixture of:
    A) Smoke and dust
    B) Smoke and fog
    C) Fog and vapor

D) Dust and vapor

✅ **Correct Answer: B**

13. **Q13.** Green chemistry focuses on:
    A) Maximizing waste
    B) Reducing pollution
    C) Increasing chemical usage
    D) None of the above

    ✅ **Correct Answer: B**

14. **Q14.** Which one of the following is a biodegradable pollutant?
    A) DDT
    B) Plastics
    C) Sewage
    D) Glass

    ✅ **Correct Answer: C**

15. **Q15.** The primary cause of global warming is:
    A) Acid rain
    B) Ozone layer
    C) Greenhouse gases
    D) Nuclear radiation

    ✅ **Correct Answer: C**

16. **Q16.** Which gas is the major component of photochemical smog?
    A) NO_2
    B) CO
    C) O_3
    D) CH_4

    ✅ **Correct Answer: A**

17. **Q17.** Which of the following is not a source of water pollution?
    A) Industrial waste
    B) Domestic sewage
    C) Agricultural runoff
    D) Wind energy

    ✅ **Correct Answer: D**

18. **Q18.** What is the main reason behind the depletion of the ozone layer?
    A) SO_2
    B) NO_2
    C) CFCs
    D) CO_2

    ✅ **Correct Answer: C**

19. **Q19.** Which radiation is blocked by the ozone layer?
    A) Infrared
    B) UV rays
    C) Gamma rays

D) X-rays

✅ **Correct Answer: B**

20. **Q20.** Which element is a major pollutant from automobile exhausts?
    A) Lead
    B) Mercury
    C) Iron
    D) Silver

    ✅ **Correct Answer: A**

21. **Q21.** Which process is used for removal of particulate pollutants from air?
    A) Electrostatic precipitation
    B) Chlorination
    C) Ozonation
    D) Adsorption

    ✅ **Correct Answer: A**

22. **Q22.** The main source of carbon monoxide in urban areas is:
    A) Forest fires
    B) Power plants
    C) Automobile exhaust
    D) Industrial emissions

    ✅ **Correct Answer: C**

23. **Q23.** Noise pollution is measured in:
    A) Joules
    B) Decibels
    C) Hertz
    D) Watts

    ✅ **Correct Answer: B**

24. **Q24.** Which among the following gases is a primary air pollutant?
    A) Ozone
    B) Carbon monoxide
    C) Sulfur trioxide
    D) Nitric acid

    ✅ **Correct Answer: B**

25. **Q25.** Which of these diseases is caused by drinking arsenic-contaminated water?
    A) Blue baby syndrome
    B) Fluorosis
    C) Arsenicosis
    D) Cholera

    ✅ **Correct Answer: C**

26. **Q26.** Which pollutant is responsible for methemoglobinemia (blue baby syndrome)?
    A) Nitrate
    B) Phosphate
    C) Sulfate

D) Lead

✅ **Correct Answer: A**

27. **Q27.** The term BOD refers to:
    A) Biochemical Oxygen Demand
    B) Biological Organic Demand
    C) Biogas Oxygen Demand
    D) Biochemical Organic Determinants

    ✅ **Correct Answer: A**

28. **Q28.** Which of the following gases can cause acid rain?
    A) CH_4 and CO_2
    B) SO_2 and NOx
    C) CO and CO_2
    D) NH_3 and HCl

    ✅ **Correct Answer: B**

29. **Q29.** Which chemical is used for chlorination of drinking water?
    A) Bleaching powder
    B) Sodium bicarbonate
    C) Potassium permanganate
    D) Ammonia

    ✅ **Correct Answer: A**

30. **Q30.** Which of the following is responsible for causing Minamata disease?
    A) Lead
    B) Mercury
    C) Arsenic
    D) Fluoride

    ✅ **Correct Answer: B**

31. **Q31.** A pollutant that accumulates in bones and teeth is:
    A) Mercury
    B) Arsenic
    C) Lead
    D) Cadmium

    ✅ **Correct Answer: C**

32. **Q32.** The term "greenhouse effect" was first coined by:
    A) Joseph Black
    B) Joseph Priestley
    C) Svante Arrhenius
    D) Robert Hooke

    ✅ **Correct Answer: C**

33. **Q33.** Depletion of the ozone layer is measured in:
    A) Celsius
    B) Decibels
    C) Dobson units

D) Kilopascals

✅ **Correct Answer: C**

34. **Q34.** Which method is best suited for removing oil spills from water?
    A) Skimming
    B) Sedimentation
    C) Filtration
    D) Chlorination

    ✅ **Correct Answer: A**

35. **Q35.** Which gas is known as "laughing gas" and is also a greenhouse gas?
    A) CO
    B) CO_2
    C) N_2O
    D) CH_4

    ✅ **Correct Answer: C**

36. **Q36.** Fly ash is a pollutant generated by:
    A) Nuclear power plants
    B) Wind turbines
    C) Thermal power plants
    D) Solar panels

    ✅ **Correct Answer: C**

37. **Q37.** E-waste refers to:
    A) Energy-saving devices
    B) Electrical and electronic waste
    C) Environmental-friendly products
    D) Earth-based materials

    ✅ **Correct Answer: B**

38. **Q38.** Which of the following is a secondary pollutant?
    A) NO
    B) CO
    C) O_3
    D) SO_2

    ✅ **Correct Answer: C**

39. **Q39.** Which toxic gas was released during the Bhopal gas tragedy?
    A) Methyl isocyanate
    B) Carbon monoxide
    C) Hydrogen sulfide
    D) Ammonia

    ✅ **Correct Answer: A**

40. **Q40.** Which heavy metal causes Itai-Itai disease?
    A) Lead
    B) Cadmium
    C) Mercury

D) Chromium

✅ **Correct Answer: B**

41. **Q41.** What is the major cause of water pollution in rivers in India?
    A) Nuclear waste
    B) Industrial effluents
    C) Agricultural runoff
    D) Domestic sewage

    ✅ **Correct Answer: D**
42. **Q42.** The Kyoto Protocol deals with:
    A) Banning nuclear weapons
    B) Air traffic control
    C) Reducing greenhouse gas emissions
    D) Ozone layer protection

    ✅ **Correct Answer: C**
43. **Q43.** PAN (Peroxyacetyl nitrate) is a:
    A) Primary pollutant
    B) Secondary pollutant
    C) Greenhouse gas
    D) Fertilizer

    ✅ **Correct Answer: B**
44. **Q44.** Which gas causes suffocation and death by preventing oxygen transport in the body?
    A) O_3
    B) CO
    C) CO_2
    D) NO_2

    ✅ **Correct Answer: B**
45. **Q45.** Which type of pollution is caused by high-decibel sound?
    A) Air pollution
    B) Water pollution
    C) Soil pollution
    D) Noise pollution

    ✅ **Correct Answer: D**
46. **Q46.** What is the full form of CFCs?
    A) Carbon Fluoride Compounds
    B) Chloro Fluoro Carbons
    C) Chemical Fuel Compounds
    D) Chloride Fluoride Chemicals

    ✅ **Correct Answer: B**
47. **Q47.** Which gas is used to disinfect drinking water in municipal water supplies?
    A) Oxygen
    B) Chlorine

C) Carbon dioxide
D) Sulfur dioxide
✅ **Correct Answer: B**

48. **Q48.** Which of the following is a biodegradable pollutant?
A) Plastic
B) DDT
C) Sewage
D) Glass
✅ **Correct Answer: C**

49. **Q49.** Which of the following is a characteristic of a good fuel?
A) High ignition temperature
B) Low calorific value
C) High calorific value
D) High ash content
✅ **Correct Answer: C**

50. **Q50.** Eutrophication is caused by excessive:
A) Heavy metals
B) Salts
C) Fertilizers
D) Oil spills
✅ **Correct Answer: C**

51. **Q51.** Which of the following is used to neutralize acidity in lakes caused by acid rain?
A) Sodium chloride
B) Baking soda
C) Calcium carbonate
D) Sodium carbonate
✅ **Correct Answer: C**

52. **Q52.** The unit used to express BOD is:
A) mg/L
B) g/L
C) ppm
D) ppb
✅ **Correct Answer: A**

53. **Q53.** The major cause of smog is:
A) Ozone
B) Carbon dioxide
C) Unburnt hydrocarbons and NOx
D) Sulfur dioxide
✅ **Correct Answer: C**

54. **Q54.** Which of the following methods is used to remove particulate pollutants from exhaust gases?
A) Cyclonic separator

B) Condensation
C) Filtration
D) Adsorption
✅ **Correct Answer: A**

55. **Q55.** Which of the following is the best method to control noise pollution?
A) Use of silencers
B) Use of loudspeakers
C) Open-air concerts
D) Shouting
✅ **Correct Answer: A**

56. **Q56.** The term "photochemical smog" is associated with:
A) Sulfur compounds
B) Hydrocarbons and NOx
C) Water vapor
D) Carbon monoxide
✅ **Correct Answer: B**

57. **Q57.** Which of these pollutants affects the nervous system?
A) Fluoride
B) Carbon dioxide
C) Lead
D) Sulfate
✅ **Correct Answer: C**

58. **Q58.** The pollutant responsible for the Taj Mahal's discoloration is:
A) SO_2
B) NO_2
C) CO
D) CFCs
✅ **Correct Answer: A**

59. **Q59.** Which of the following is a source of indoor air pollution?
A) Radon
B) Nitrogen
C) Oxygen
D) Carbon dioxide
✅ **Correct Answer: A**

60. **Q60.** Which one of the following pollutants is associated with motor vehicle exhaust?
A) Ozone
B) Carbon monoxide
C) Methane
D) Sulfur
✅ **Correct Answer: B**

61. **Q61.** The most common method of solid waste disposal is:
A) Composting

B) Incineration
C) Landfilling
D) Recycling
✅ **Correct Answer: C**

62. **Q62.** Which chemical is responsible for the depletion of the ozone layer?
A) Carbon monoxide
B) Sulfur dioxide
C) Chlorofluorocarbons
D) Nitrogen dioxide
✅ **Correct Answer: C**

63. **Q63.** What is the greenhouse gas emitted predominantly from paddy fields?
A) Carbon dioxide
B) Methane
C) Nitrous oxide
D) CFCs
✅ **Correct Answer: B**

64. **Q64.** Which of the following is not a greenhouse gas?
A) Methane
B) Nitrous oxide
C) Oxygen
D) Carbon dioxide
✅ **Correct Answer: C**

65. **Q65.** Acid rain is harmful to:
A) Human health
B) Plant life
C) Aquatic life
D) All of the above
✅ **Correct Answer: D**

66. **Q66.** What is the function of catalytic converters in vehicles?
A) Increase fuel efficiency
B) Reduce noise
C) Convert harmful gases to harmless ones
D) Improve speed
✅ **Correct Answer: C**

67. **Q67.** Which water pollutant reduces oxygen-carrying capacity of blood?
A) Arsenic
B) Carbon monoxide
C) Lead
D) Nitrate
✅ **Correct Answer: D**

68. **Q68.** Greenhouse gases trap:
A) Ultraviolet radiation

B) Infrared radiation
C) X-rays
D) Visible light
✅ **Correct Answer: B**

69. **Q69.** A common pollutant released from nuclear power plants is:
A) CO_2
B) Iodine-131
C) CH_4
D) SO_2
✅ **Correct Answer: B**

70. **Q70.** What is the major source of sulfur dioxide in the environment?
A) Vehicle exhaust
B) Industrial combustion
C) Household cooking
D) Agriculture
✅ **Correct Answer: B**

71. **Q71.** Which type of radiation is blocked by the ozone layer?
A) Infrared
B) Gamma
C) Ultraviolet
D) X-rays
✅ **Correct Answer: C**

72. **Q72.** Which of the following is most effective in controlling water pollution?
A) Dumping waste in rivers
B) Treating sewage before discharge
C) Releasing industrial waste untreated
D) Use of plastics
✅ **Correct Answer: B**

73. **Q73.** Which among the following is not a heavy metal pollutant?
A) Lead
B) Mercury
C) Cadmium
D) Potassium
✅ **Correct Answer: D**

74. **Q74.** The chemical responsible for acidification of rainwater is:
A) CO_2
B) NH_3
C) SO_2
D) CH_4
✅ **Correct Answer: C**

75. **Q75.** Bioaccumulation is the:
A) Increase in oxygen in organisms

B) Accumulation of substances in an organism over time
C) Biological multiplication
D) Accumulation of water in soil
✅ **Correct Answer: B**

76. **Q76.** Which gas has the highest global warming potential (GWP)?
A) CO_2
B) CH_4
C) N_2O
D) CFCs
✅ **Correct Answer: D**

77. **Q77.** Photochemical smog causes irritation in:
A) Eyes
B) Skin
C) Nose
D) Ears
✅ **Correct Answer: A**

78. **Q78.** Which country hosted the Earth Summit in 1992?
A) India
B) Brazil
C) USA
D) China
✅ **Correct Answer: B** (Rio de Janeiro)

79. **Q79.** Which of the following organisms is an indicator of clean water?
A) Lichen
B) Tubifex
C) E. coli
D) Fish
✅ **Correct Answer: A**

80. **Q80.** Which of the following gases is the most abundant greenhouse gas?
A) CO_2
B) CH_4
C) N_2O
D) H_2O vapor
✅ **Correct Answer: D**

81. **Q81.** Which pollutant is primarily responsible for acid rain?
A) CO
B) SO_2
C) O_3
D) CO_2
✅ **Correct Answer: B**

82. **Q82.** What is the main component of biogas?
A) Ethane

B) Propane
C) Methane
D) Butane
✅ **Correct Answer: C**

83. **Q83.** What is the normal pH of rainwater?
A) 7
B) 6.5
C) 5.6
D) 4.5
✅ **Correct Answer: C**

84. **Q84.** Which metal is associated with Minamata disease?
A) Lead
B) Cadmium
C) Mercury
D) Chromium
✅ **Correct Answer: C**

85. **Q85.** The pollutant responsible for blue baby syndrome is:
A) Sulphate
B) Nitrate
C) Fluoride
D) Arsenic
✅ **Correct Answer: B**

86. **Q86.** Green chemistry focuses on:
A) Pollution control
B) Conservation of fuel
C) Designing safer chemicals
D) Using more chemicals
✅ **Correct Answer: C**

87. **Q87.** Which of the following is the primary source of NOx pollutants?
A) Automobiles
B) Fertilizers
C) Forest fires
D) Sewage
✅ **Correct Answer: A**

88. **Q88.** What is the major cause of depletion of fish population in rivers?
A) Increased vegetation
B) Oil spillage
C) Decreased oxygen levels
D) Mining
✅ **Correct Answer: C**

89. **Q89.** Which of the following is *not* a feature of sustainable development?
A) Use of renewable energy

B) Waste minimization
C) Overuse of natural resources
D) Conservation practices
✅ **Correct Answer: C**

90. **Q90.** Algal bloom in water bodies is caused by excess:
A) Organic matter
B) Oxygen
C) Nutrients
D) Metals
✅ **Correct Answer: C**

91. **Q91.** Which pollutant is linked to bone deformities in children?
A) Lead
B) Cadmium
C) Mercury
D) Fluoride
✅ **Correct Answer: D**

92. **Q92.** Which one of the following is a secondary pollutant?
A) NO_2
B) SO_2
C) Ozone
D) CO
✅ **Correct Answer: C**

93. **Q93.** The main source of fluorosis is:
A) Contaminated food
B) Contaminated water
C) Contaminated air
D) Contaminated soil
✅ **Correct Answer: B**

94. **Q94.** The biodegradable waste can be converted to useful substances by:
A) Composting
B) Incineration
C) Landfilling
D) Dumping
✅ **Correct Answer: A**

95. **Q95.** Which one of the following is not a consequence of deforestation?
A) Loss of biodiversity
B) Soil erosion
C) Global warming
D) Ozone formation
✅ **Correct Answer: D**

96. **Q96.** What is the function of an electrostatic precipitator?
A) Removal of gaseous pollutants

B) Removal of CO_2
C) Removal of particulate matter
D) Cooling the exhaust gases
✅ **Correct Answer: C**

97. **Q97.** Ozone hole is mainly observed over:
A) Asia
B) Europe
C) Arctic region
D) Antarctic region
✅ **Correct Answer: D**

98. **Q98.** DDT is a:
A) Fertilizer
B) Fungicide
C) Herbicide
D) Pesticide
✅ **Correct Answer: D**

99. **Q99.** What is the major cause of thermal pollution?
A) Sewage
B) Hot water from industries
C) Oil spills
D) Agricultural runoff
✅ **Correct Answer: B**

100. **Q100.** Which pollutant is responsible for respiratory problems and acid rain both?
A) NO_2
B) O_3
C) CH_4
D) CO
✅ **Correct Answer: A**

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