Step Academy official

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STUDENT NAME	
PAPER CODE	85803
TIME ALLOWED	
Paper Date	

CLASS	9th
SUBJECT	Chemistry
TOTAL MARKS	
Paper Type	

Choose the correct answer.

1. The branch of chemistry that focuses on the study of polymers, their types, properties, uses is called:

(A) Industrial Chemistry **(B)** Polymer chemistry **(C)** Organic Chemistry **(D)** Astrochemistry

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3. 2) The branch of chemistry that helps to treat diseases, organic and to synthesize new medicines.

(A) Physical **(B)** Organic **(C)** Inorganic **(D)** Environmental

4. 2) The branch of chemistry that helps to treat diseases, organic and to synthesize new medicines.

(A) Physical **(B)** Organic **(C)** Inorganic **(D)** Environmental

5. Which branch of chemistry helps to protect water that has been poisoned by soil?

(A) Environmental Chemistry **(B)** Organic Chemistry **(C)** Inorganic Chemistry **(D)** Geo Chemistry

6. To identify the concentration of a particular solution through titration is and application of:

(A) Astrochemistry **(B)** Analytical Chemistry **(C)** Geochemistry **(D)** Organic chemistry

7. The branch of chemistry that is concerned with the large-scale production of chemical substances is:

(A) Industrial chemistry **(B)** Physical chemistry **(C)** Inorganic chemistry **(D)** Environmental chemistry

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9. The batteries in our vehicles are built on the principle of electrochemistry. It is the application of:

(A) Astrochemistry **(B)** Analytical Chemistry **(C)** organic chemistry **(D)** Physical chemistry

10. The branch of science helps to understand chemical products and processes that reduce the use of hazardous substances:

(A) Analytical Chemistry **(B)** Physical Chemistry **(C)** Green Chemistry **(D)** Astrochemistry

11.
Which branch of chemistry is the study of elements and their compounds except for organic compounds?

(A) Physical Chemistry **(B)** Organic Chemistry **(C)** Inorganic Chemistry **(D)** Geochemistry

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14.
Which area of chemistry improves to guage the behavior of pollutants and develop techniques for pollution control?

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16.
The study of the interaction between drugs and biological targets, as well as the development of new medicinal agents.

(A) Organic chemistry **(B)** Medicinal chemistry **(C)** Inorganic chemistry **(D)** Environmental chemistry

17. Anything that has mass and occupies space is called.

(A) liquid **(B)** gas **(C)** solid **(D)** matter

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(A) liquid **(B)** gas **(C)** solid **(D)** matter

19. Following are states of matter:

(A) gas **(B)** liquid **(C)** sold **(D)** all of these

20. Matter can be described by both its:

(A) physical properties and chemical properties. **(B)** physical properties **(C)** chemical properties **(D)** none of these

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(A) physical properties and chemical properties. **(B)** physical properties **(C)** chemical properties **(D)** none of these

22. Macroscopic properties are properties that can be visualized by:

(A) the naked eye **(B)** microscope **(C)** electron microscope **(D)** telescope

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(A) the naked eye **(B)** microscope **(C)** electron microscope **(D)** telescope

24. A substance formed when two or more different combine chemically.

(A) atom **(B)** compound **(C)** element **(D)** solution

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(A) atom **(B)** compound **(C)** element **(D)** solution

26. Number of neutrons in $^{27}_{13}M$ are:

(A) 13 **(B)** 14 **(C)** 27 **(D)** 15

27. $_{11}Na$ has electronic configuration:

(A) $1s^2, 2s^2, 3s^1$ **(B)** $1s^2, 2s^2, 2p^7$ **(C)** $1s^2, 2s^2, 2p^5, 3s^2$ **(D)** $1s^2, 2s^2, 2p^6, 3s^1$

28. A sub-shell that can accommodate 6 electrons is:

(A) s **(B)** p **(C)** d **(D)** f

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(A) s **(B)** p **(C)** d **(D)** f

30. M shell has sub-shells:

(A) 1s, 2s **(B)** 2s, 2p **(C)** 3s, 3p, 3d **(D)** 1s, 2s, 3s

31. M shell has sub-shells:

(A) 1s, 2s **(B)** 2s, 2p **(C)** 3s, 3p, 3d **(D)** 1s, 2s, 3s

32. Chlorine has two isotopes, both of which have:

(A) same mass number **(B)** same number of neutrons. **(C)** different number of protons. **(D)** same number of electrons.

33. Which isotope is used in nuclear reactors?

(A) U-234 **(B)** U-238 **(C)** U-235 **(D)** All of these

34. Which of the following statement is not correct about isotopes?

(A) they have same atomic number **(B)** they has same number of protons **(C)** they have same chemical properties **(D)** they have same physical porperties

35. Which of the following elements belongs to VIII A?

(A) Na **(B)** Mg **(C)** Br **(D)** Xe

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37. Which of the following elements you expect to have greater shielding effect?

(A) Li **(B)** Na **(C)** K **(D)** Rb

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(A) Li **(B)** Na **(C)** K **(D)** Rb

39. Number of periods in the periodic table are:

(A) 8 **(B)** 7 **(C)** 16 **(D)** 5

40. As you move from right to left across a period, which of the following does not increase:

(A) electron affinity **(B)** ionization energy **(C)** nuclear charge **(D)** shielding effect

41. Valence shell electronic configuration of an element M (atomic no. 14) is:

(A) $2s^2, 2p^1$ **(B)** $2s^2, 2p^2$ **(C)** $2s^2, 2p^3$ **(D)** $3s^2, 3p^2$

42. Which of the following elements belongs to VIII A?

(A) Na **(B)** Mg **(C)** Br **(D)** Xe

43. Which of the following groups contain alkaline earth metals?

(A) I A **(B)** II A **(C)** VII A **(D)** VIII A

44. Main group elements are arranged in _____ groups.

(A) 6 **(B)** 7 **(C)** 8 **(D)** 10

45. Period number of $^{27}_{13}Al$ is:

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

46.
All the elements of Group II A are less reactive than alkali metals. This is because these elements have:

(A) high ionization energies **(B)** relatively greater atomic sizes **(C)** similar electronic configuration **(D)** decreased nuclear charge

47. In the formation of AlF_3, aluminium atom loses _____ electrons.

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

48. Silicon belongs to Group IVA. It has _____ electrons in the valence shell.

(A) 2 **(B)** 3 **(C)** 4 **(D)** 6

49. Which of the following atoms will form an ion of charge-2?

(A)	**(B)**	**(C)**	**(D)**
Atomic Number	Atomic Number	Atomic Number	Atomic Number
Mass Number	Mass Number	Mass Number	Mass Number
12	14	8	10
24	28	8	20

50. Which of the following atoms obey duplet rule?

(A) O_2 **(B)** F_2 **(C)** H2 **(D)** N_2

51. Which of the following atoms will form cation.

(A) 20 **(B)** 17 **(C)** 18 **(D)** 15

52. Which of the following is not true about the formation of Na_2S:

(A) Each sodium atom loses one electron **(B)** Sodium forms cation **(C)** Sulphur forms anion **(D)** Each sulphur atom gains one electron

53. Identity the covalent compound:

(A) NaCl **(B)** MgO **(C)** H_2O **(D)** KF

54.
Phosphorus belongs to third period of Group VA. How many electrons it needs to complete its valence shell.

(A) 2 **(B)** 3 **(C)** 4 **(D)** 5

55. If one mole of carbon contains x atoms, what is the number of atoms contained in 12 *g* of *Mg*.

(A) x **(B)** 0.5 x **(C)** 2x **(D)** 1.5x

56. How many moles of molecules are there in 16 *g* oxygen.

(A) 1 **(B)** 0.5 **(C)** 0.1 **(D)** 0.05

57. What is the formula mass of $CuSO_4.5H_2O$. (Atomic masses: Cu= 63.5, S=32, O=16, H=1)

(A) 159.5 **(B)** 185.5 **(C)** 249.5 **(D)** 149.5

58. What is the mass of carbon present in 44 g of carbon dioxide?

(A) 12 g **(B)** 6 g **(C)** 24 g **(D)** 44 g

59. What is the mass of 4 moles of hydrogen gas?

(A) 8.064 g **(B)** 4.032 g **(C)** 1 g **(D)** 1.008 g

60.
A compound with chemical formula Na2CX3 has formula mass 106 amu. Atomic mass of the element X is:

(A) 106 **(B)** 23 **(C)** 12 **(D)** 16

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62. Which of the following changes reaction is an example of oxidation.

(A)	**(B)**	**(C)**	**(D)**
Chlorine molecule to chloride ion	Silver atoms to silver (I) ion	Oxygen molecule to oxide ion	Iron (III) ion to iron (II) ion

63. Consider the following reaction: $H_2S + Cl_2 \rightarrow 2HCl + S$
In this reaction H_2S behaves as:

(A) Reducing agent **(B)** Oxidizing agent **(C)** Catalyst **(D)** Electrolyte

64. The oxidation state of Cr in $K_2Cr_2O_7$ is:

(A) + 12 **(B)** + 6 **(C)** + 3 **(D)** - 6

65. Which of the following elements in the given reaction is reduced? $ZnO + H_2 \rightarrow Zn + H_2O$

(A) H_2 **(B)** ZnO **(C)** Zn **(D)** O

66. In which of the following changes, the nitrogen atom is reduced.

(A) N_2 to NO **(B)** N_2 to NO_2 **(C)** N_2 to NH_3 **(D)** N_2 to HNO_3

67.
Activation energy of a chemical reaction must be _____ the average kinetic energy of reacting molecules.

(A) Lower than **(B)** greater than **(C)** equal to **(D)** None of these

68. If the value is negative than reaction will be:

(A) Exothermic **(B)** Endothermic **(C)** May or may not be Exothermic or Endothermic **(D)** None of these

69. A catalyst increases the rate of a chemical reaction by:

(A) increasing activation energy **(B)** increasing the enthalpy of reaction **(C)** Decreasing the enthalpy of reaction **(D)** None of these

70. Which is not released in an aerobic respiration?

(A) Carbon dioxide **(B)** Water **(C)** Energy **(D)** Lactic acid

71. All chemical reactions involve:

(A) Catalysts **(B)** Enzymes **(C)** Energy changes **(D)** All of these

72. Which is true about the equilibrium state?

(A) The forward reaction stops. **(B)** The reverse reaction stops. **(C)** Both forward and reverse reaction stop. **(D)** Both forward and reverse reaction continue at the same rate.

73. Which of the following does not happen, when a system is at equilibrium state?

(A) forward and reverse reactions stop. **(B)** forward and reverse rates become equal. **(C)** concentration of reactants and products stop changing **(D)** reaction continues to occur in both the directions.

74. Concentration of reactants and products at equilibrium remains unchanged if:

(A) concentration of any reactant or product is not changed **(B)** temperature of the reaction is not changed. **(C)** pressure or volume of the system is not changed. **(D)** all of the above are observed.

75.
When a mixture of and is sealed in a flask and temperature is kept at 25oC, following equilibrium is established.

$H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$

Which substance or substances will be present in the equilibrium mixture?

(A) H_2 and I_2 **(B)** HI only **(C)** H_2 only **(D)** H_2, I_2 and HI

76. In an irreversible reaction equilibrium is:

(A) established quickly **(B)** established slowly **(C)** never established **(D)** established when reaction stops.

77. Which of the following cannot be classified as Arrhenius acid?

(A) HNO_3 **(B)** H_2CO_3 **(C)** CO_2 **(D)** H_2SO_4

78. Ammonia is a base, because it:

(A) ionizes in water to give OH- ions **(B)** Contains OH group **(C)** Can accept an election pair **(D)** Can accept proton

79. Which of the following is a Bronsted base?

(A) NH_3 **(B)** HCl **(C)** CH_3COOH **(D)** H_3O^+

80.
Milk of magnesia contains $Mg(OH)_2$. It is used as antacid. It neutralizes excess stomach acid. Which salt is formed in this reaction?

(A) $MgSO_4$ **(B)** $MgCO_3$ **(C)** $MgCl_2$ **(D)** MgO

81. Consider the following reaction?
$H_2O + HCl \rightleftharpoons H_3O^+ + Cl^-$
Which species is an electron proton acceptor in this reaction?

(A) H_2O **(B)** HCl **(C)** H_3O^+ **(D)** none

82. Which is/are responsible for acid rain?

(A) SO_2 **(B)** NO_2 **(C)** Both NO_2 and SO_2 **(D)** O_3

83. Which is reddish brown gas?

(A) NO **(B)** NO_2 **(C)** SO_2 **(D)** O_3

84. Most air pollution is caused by:

(A) Ozone **(B)** Acid rain **(C)** Carbon monoxide **(D)** The burning of fossil fuels

85. What process is used to purify water to produce distilled water?

(A) filtration **(B)** distillation **(C)** reverse osmosis **(D)** sedimentation

86. What is the pH level of distilled water?

(A) 4 **(B)** 5 **(C)** 7 **(D)** 9

87. What is a commonly application of tap water in a chemistry laboratory?

(A) preparing chemical reagents **(B)** calibration of sensors **(C)** cleaning glasswater **(D)** measuring pH level

88. What harmfull substances can wastewater carry?

(A) only minerals **(B)** pathogens,bacteria **(C)** pure water **(D)** oxygen

89. What types of harmfull microbes can be found in natural water sources?

(A) only bacteria **(B)** only viruses **(C)** bacteria.viruses **(D)** only parasites

90. What is eutrophication caused by?

(A) low phosphate concentration **(B)** high concentration **(C)** increase water flow **(D)** improved water clarity

91. Where do fish and other marine life get their oxygen?

(A) From air bubbles **(B)** From dissolved **(C)** From food **(D)** From sunlight

92. What can household waste containing detergents do to aquatic life?

(A) improve water quality **(B)** enhance fish growth **(C)** cause the death of aquatic life **(D)** increase water clarity

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95. Condensed structural formula for butane is:

(A) CH_3-CH_2-CH_3 **(B)** CH_3-CH_2-CH_2-CH_3 **(C)** CH_3-CH_2-CH_2-CH_2-CH_3 **(D)** CH_3-CH_3

96. CH3-CH2-CH3 is the chemical formula for:

(A) Ethane **(B)** Propane **(C)** Butane **(D)** Pentane

97. Ethanoic acid contains functional group:

(A) -OH **(B)** -CO- **(C)** -COOH **(D)** -CHO

98. Stem "But" stands for how many Carbon atoms.

(A) 2 **(B)** 3 **(C)** 4 **(D)** 5

99. In which of the following is an alcohol?

(A) CH_3-CH_2-O-CH_2-CH_3 **(B)** CH_3-CH_2-COOH **(C)** C_6H_5-OH **(D)** CH_3-CH_2-OH

100. Which compound is not a saturated hydrocarbon?

(A) CH_3-CH_3 **(B)** CH_4 **(C)** CH_3-CH= CH_2 **(D)** CH_3-CH_2-CH_3

101. The functional group of amines is:

(A) -OH **(B)** -COOH **(C)** -NH_2 **(D)** -CHO

102. Reduction of cholоromethane gives:

(A) Hydrogen **(B)** Chlorine **(C)** Methane **(D)** All of these

103. Which product is obtained when chloromethane (or methyl chloride) is reduced?

(A) Ethane **(B)** Ethene **(C)** Methane **(D)** Ethyne

104. Combustion of methane produces:

(A) Carbon dioxide **(B)** Water **(C)** Heat **(D)** All of these

105. By hydrogentaion we mean, the addition of:

(A) Hydrogen **(B)** Water **(C)** Halogen **(D)** Hydrogen halide

106. Which molecule contains a carbon-carbon single bond?

(A) Ethane **(B)** Ethene **(C)** Ethyne **(D)** Methanol

107.
In small village children frequently suffered from different infectious diseases due to weak immune systems. Which major nutrients were lacking in their food?

(A) Amino acids **(B)** Carbohydrates **(C)** Proteins **(D)** Lipids

108. The major function of carbohydrates includes:

(A) Storage **(B)** Structural framework **(C)** Defense system of body **(D)** Messenger

109. Which of the following food components are rich in fats:

(A) Rice and maize **(B)** Pulses and wheat **(C)** Milk, egg, and beans **(D)** Cheese, butter, and oil

110. What is a bond between amino acids called?

(A) ionic bond **(B)** acidic bond **(C)** peptide bond **(D)** hydrogen bond

111. Potatoes , cereals, beans, pulses, and oats are rich in:

(A) Proteins **(B)** Carbohydrates **(C)** Amino acids **(D)** Fats

112. Which of the following disorders is NOT caused by the deficiency of proteins?

(A) Weight loss **(B)** Muscle fatigue **(C)** Loss in muscle strength **(D)** Constipation

113. Which nutrient builds, maintains and repairs body tissues and cells?

(A) Carbohydrates **(B)** Proteins **(C)** Lipids **(D)** Water

114.
Marium's doctor told her that she is facing shortage of blood and have anemia. What nutrients are lacking in Marium's diet?

(A) Carbohydrates **(B)** Protein **(C)** Lipids **(D)** Water

115.
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(A) Carbohydrates **(B)** Protein **(C)** Lipids **(D)** Water

116. Meat, fish and other alternatives provide the following important nutrients:

(A) Carbohydrates **(B)** Proteins **(C)** Lipids **(D)** Sugar

117. What is the volume of the liquid in this graduated cylinder?

(A) 23 **(B)** 24 **(C)** 25 **(D)** 22

118. In the measuring intruments, the degree of conformity and closeness to the true value is known as:

(A) precision **(B)** accuracy **(C)** sensitivity **(D)** compatibility

119. A distance of 1 kilometer means?

(A) 100 m **(B)** 1000 cm **(C)** 1000 cm **(D)** 1000 m

120. In SI, the unit of mass is:

(A) kilogram **(B)** centimetre **(C)** kelvin **(D)** millimetre

121. To change SI units by factors of ten into smaller or bigger units they use:

(A) Prefixes **(B)** Symbols **(C)** abbreviation **(D)** ratio

122.
The property of a measuring instrument to give the output very close to the actual value is termed as:

(A) Sensitivity **(B)** Accuracy **(C)** Precision **(D)** Repeatability

123. One nanometer is equal to:

(A) 10^{-10}m **(B)** 10^{-9}m **(C)** 10^{-8}m **(D)** 10^{-7}m

124. The standard form of 0.00000000034 is:

(A) 3.4×10^{-8} **(B)** 3.4×10^{-9} **(C)** 3.4×10^{-10} **(D)** 3.4×10^{-11}

125. What is the liquid obtained after condensing the vapor in distillation called?

(A) solvent **(B)** solute **(C)** distillate **(D)** extract

126. In what industry are belt filters used to extract precious metals?

(A) Agriculture **(B)** Mining **(C)** Construction **(D)** Textiles

127. What is another term for filtration by filter paper?

(A) vacuum filtration **(B)** simple filtration **(C)** gravity filtration **(D)** buchner filtration

128. What happens to a liquid in an enclosed space during evaporation until saturation in reached:

(A) it solidifies **(B)** it remains constant **(C)** it evaporates completely **(D)** it continues to vaporize

129. What happens to the rate of evaporation when temperature inncrease?

(A) it decrease **(B)** it remains constant **(C)** it increases **(D)** it depends on pressure

130. What determine the formation of crystals during crystallization?

(A) temperature and pressure **(B)** size of the container **(C)** type os solvent used **(D)** color of the solute

131. Which substance would have a higher rate of evaporation?

(A) water at 10 ºC **(B)** water at 20 ºC **(C)** water at 5 ºC **(D)** water at 30 ºC

132. What can be evaporated from link to recover dye?

(A) water **(B)** solvent **(C)** alcohol **(D)** pigment

133. How is cryogenic distillation used in industry?

(A) to separate air into its components **(B)** to refine crude oil **(C)** to purify water **(D)** to extract essentail oil

134. Which process involves the formation of stalagmites and stalactities in cave?

(A) filtration **(B)** crystallization **(C)** distillation **(D)** evaporation

135.

What can we determine about the intermolecular forces of a substances with a high enthalpy of vaporization?

(A) they are weak **(B)** they are strong **(C)** they are nuetral **(D)** they are non-existent

136. Which distilled product finds application in lead-acid batteries?

(A) crude oil **(B)** distilled water **(C)** essentail oil **(D)** alcohol

137. What observation confirms that crystallization is occuring in a saturated solution?

(A) the solution turns blue **(B)** cloudiness and crystal formation **(C)** bubbles from at the surface **(D)** the solution become denser

138. Which gas helps in combustion process?

(A) Oxygen **(B)** Nitrogen **(C)** Sulphur dioxide **(D)** Carbon dioxide

139. Which guess turns the lime water, milky?

(A) Carbon monoxide **(B)** Carbon dioxide **(C)** Sulphur dioxide **(D)** Oxygen

140. The colour imparted by the flame of sodium metal is:

(A) Blue **(B)** Green **(C)** Golden yellow **(D)** Purple

141. Ammonia is a gas:

(A) Acidic **(B)** Basic **(C)** Neutral **(D)** Amphoteric

142. Electrons of alkali metals excite by absorbing the light in:

(A) Visible wavelength **(B)** *UV* wavelength **(C)** *IR* wavelength **(D)** Radio wavelength

143. Chromatography is a technique used to separate:

(A) Simple mixtures **(B)** Complex mixtures **(C)** Viscous mixtures **(D)** Metals

144. In chromatography, the stationary phase can be:

(A) Solid or liquid **(B)** Liquid or gas **(C)** Solid only **(D)** Liquid only

145. Which of the following cannot be used as an adsorbent in Column adsorption chromatography?

(A) Magnesium oxide **(B)** Silica gel **(C)** Activated alumina **(D)** Potassium permanganate

146. In Thin Layer Chromatography (TLC), the stationary phase is made of:

(A) Solid, liquid **(B)** Liquid, liquid **(C)** Liquid, gas **(D)** Solid, gas

147.

In Column chromatography, the stationary phase is made of _____ and the mobile phase is made of _____:

(A) Solid, liquid **(B)** Liquid, liquid **(C)** Liquid, gas **(D)** Solid, gas

148.
Which of the following types of chromatography involves the separation of substances in a mixture over a 0.2mm thick layer of an adsorbent?

(A) Gas-liquid **(B)** Column **(C)** Thin layer **(D)** Paper

149.
In which type of paper chromatography does the mobile phase move horizontally over a circular sheet of paper?

(A) Ascending paper chromatography **(B)** Descending paper chromatography **(C)** Radial paper chromatography **(D)** Ascending – descending chromatography

150. Liquid chromatography can be performed in which of the following ways?

(A) Only in columns **(B)** Only on plane surfaces **(C)** Either in columns or on plane surfaces **(D)** Neither in columns nor on plane surfaces

Write short answers of the following questions.

1 . How does chemistry help a doctor to know about the chemical nature of medicine?

2 . How does chemistry help a doctor to know about the chemical nature of medicine?

3 . Differentiate between geochemistry and astrochemistry.

4 . With the help of the Venn diagram compare and contrast organic and inorganic chemistry.

5 . Can you write the formula of the carbon dioxide gas that we exhale?

6 . Differentiate between compound and mixture.

7 . Differentiate between compound and mixture.

8 . Differentiate between compound and mixture.

9 . Distinguish between shell and sub-shell.

10 . Distinguish between shell and sub-shell.

11 . List the sub-shells of M shell in order of increasing energy.

12 . Why an atom is electrically neutral?

13 . Give notation for sub-shells of M shell.

14 . Can you identify an atom without knowing number of neutrons in it?

15 . Can you identify an atom without knowing number of neutrons in it?

16 .
Write the valence shell electronic configuration of an element present in the 3rd period and Group III A.

17 . Which atom has higher shielding effect, Li or Na?

18 . Alkali metals belong to S-block in the periodic table, why?

19 . Define halogens.

20 . Explain why, Na has higher ionization energy than K?

21 . State octet and duplet rules.

22 . Explain formation of covalent bond between two nitrogen atoms.

23 . How does Al form cation?

24 . Why one mole of hydrogen molecules and one mole of H-atoms have different masses?

25 . Differentiate between empirical formula and molecular formula.

26 . What are the molar masses of uranium-238 and uranium-235?

27 . What is oxidation state?

28 . Identify reducing agent in the following reaction
$CuO + H_2 \rightarrow Cu + H_2O$

29 . Why tin plated steel is used to make food cans?

30 . Define exothermic and endothermic reactions.

31 . What is anaerobic respiration?

32 . What is the role of a catalyst in a chemical reaction?

33 . Define enthalpy of a chemical reaction.

34 . Differentiate between aerobic and anaerobic respiration.

35 . Differentiate between forward and reverse reactions.

36 . Write two chemical equations of reversible reactions.

37 . What is chemical equilibrium?

38 . Write down the conditions for equilibrium.

39 . Write the equation for the self-ionization of water.

40 . Why HCl acts as a strong acid?

41 . Why ammonia acts as a weak base?

42 . Define and give examples of Arrhenius acids.

43 . List two main sources of acid rain.

44 . Define global warming.

45 . List four human activities which contribute to air pollution.

46 . What is the role of automobile in air pollution?

47 . List some properties of water?

48 . List sources of water borne diseases.

49 . How chemistry helps maintain a clean swimming pool? Explain.

50 . Write any three steps of properties of water?

51 . Where do fish and other marine life get their oxygen?

52 . What role does dissolved oxygen play in equatic ecosystems?

53 . What is Distilled water?

54 . What is the electrical conductivity of distilled water?

55 . What types of waste are included in household waste?

56 . What is a major cause of water scarcity in pakistan?

57 . What are NPK fertilizers?

58 . What is universal solvent" defend the statement?

59 . List some water borne diseases.

60 . List steps used in raw water treatment.

61 . It is advisable to wash hands well with soap after using bathrooms. Evaluate it.

62 . What is the solubility of water?

63 . What is a major enviornmental issues caused by plastic waste?

64 . What is eutrophication, and what causes it?

65 . Why are essential minerals in natural water important for biological processes?

66 . Define tap water?

67 . In chemistry, what is distrilled water commonly used for?

68 . What is one application of tap water in a chemistry laboratory?

69 . Why is water treatment important?

70 . Name a few important fertilizers mentioned in the paragraph?

71 . Define isomerism.

72 .
Identify the type of following compounds as an alcohol, aldehyde or ketone: (c) CH_3CH_2OH, which is used in the preparation of many organic substances such as plastics, cosmetics, tinctures etc.

73 .
Identify the type of following compounds as an alcohol, aldehyde or ketone: (c) CH_3CH_2OH, which is used in the preparation of many organic substances such as plastics, cosmetics, tinctures etc.

74 . Give three examples of unsaturated compound.

75 . What is difference between an alkene and alkyne?

76 . Give three examples of saturated hydrocarbons.

77 . What is meant by cracking?

78 . Draw structure of ethane.

79 . What do you mean by hydrogenation reaction? Give one example.

80 . Give three reasons why living organisms need food.

81 . State four functions of proteins. Give one example to illustrate your answer.

82 . Carbohydrates are a major source of energy. Defend the statement.

83 . Suggest two major foods a mother could give to her growing child? And why.

84 .
Fatima has fond of junk food like French fries, burgers, and pizza. What will happen if Fatima only eats junk food? What should she add to her routine food?

85 . Differentiate between accuracy and precision.

86 .
In a race, why it is essential to use seconds or minutes as the unit for measurement for recording the time instead of hours?

87 . A chemist has sample of mass 0.003 kilograms. How will he convert this mass to milligrams?

88 .
What are the advatanges of using scientific tools like measuring cylinders, stopwatch and thermometers in measurements?

89 . Why is it important to separate materials from a mixture?

90 . What is filtration?

91 .

What is distillation?

92 . What is evaporation?

93 . How is ammonia detected by a litmus paper?

94 . How can you detect hydrogen gas?

95 . Differentiate between oxidizing and reducing flame?

96 . How can you detect sulphur dioxide?

97 . Define chromatography.

98 . What do you mean by paper chromatogram?

99 . Define locating agent.

100 . Define paper chromatography.

Write detailed answers of the following questions.

1 . Define chemistry and its interactions with other matter and energy.

2 . With the help of few examples highlight the relation between science, technology and engineering.

3 . How does geochemistry help us to solve the problems such as pollution and climate change?

4 . Define the term Allotropes Explain the allotropes of Carbon.

5 . Differentiate between the Colloids, Suspension.

6 . If there are 18 protons in the Argon atom, them what is the atomic number of Argon?

7 .
The electronic configuration listed are incorrect. Explain what mistake have been made in each and write correct electronic configurations. x= $1s^2$, $2s^2$, $2p^4$, $3p^2$, y= $1s^2$, $2s^1$, $2p^1$, z= $1s^2$,$2s^2$, $2p^5$, $3s^1$

8 . Which orbital in each of the following pairs is lower in energy? a) 2s, 2p b) 3s, 2p c) 3s, 4s

9 . Draw Bohr's Model for the following atoms indicating the location for electrons, protons and neutrons:
a) Potassium (Atomic No. 19, Mass No. 39)
b)Silicon (Atomic No. 14, Mass No. 28)
c) Argon (Atomic No. 18, Mass No. 39)

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c) Argon (Atomic No. 18, Mass No. 39)

11 . Write electronic configuration for the following elements:
a) $^{28}_{14}Si$ b) $^{24}_{12}Mg$ c) $^{27}_{13}Al$ d) $^{40}_{18}Ar$

12 .
The atomic number of an element is 23 and its mass number is 56. (a) How many protons and electrons does an atom of this element have? (b) How many neutrons does this atom have?

13 . The atomic symbol of aluminium is written as $^{27}_{13}Al$. What information do you get from it?

14 . The atomic symbol of aluminium is written as $^{27}_{13}Al$. What information do you get from it?

15 .
Arrange the elements in each of the following groups in order of increasing ionization energy:(a) Li, Na, K (b) Cl, Br, I

16 .
Specify which of the following elements you would expect to have the greatest electron affinity. S, P, Cl

17 .
Write electrons dot symbol for an atom of the following elements. (a) Be (b) K (c) N (d) I

18 .
In which block, group and periodic table where would you place each of the following elements with the following electronic configuration? (a) $1s^2, 2s^1$ (b) $1s^2, 2s^2, 2p5$ (C) $1S^2,2S^2, 2p^6 s^3$ (d) $1s^2$

19 .
Arrange the elements in each of the following in order of decreasing shielding effect. (a) Li, Na, K (b) Cl Br, I (c) Cl, Br

20 .
Electronic configuration of some elements are given below, group the elements in pairs that would represent similar chemical properties. A=$1s^2, 2s^2$ B=$1s^2, 2s^2, 2p^6$ C=$1s^2,2s^2,2p^3$ D= $1s^2$ E=$1s^2,2s^2,2p^6,3s^2,3p^3$ F=$1s^2, 2s^1$ G=$1s^2, 2s^2, 2p^6, 3s^1$ H=$1s^2,2s^2,2p^6,3s^2$

21 .
Write the valence shell electronic configuration of the atoms of the following elements. (a) An element present in period 3 of Group VA (b) An element present in period 2 of Group VI A.

22 . Describe the importance of noble gas electronic configuration.

23 . Explain how elements attain stability?

24 .
Find the number of valence electrons in the following atoms using the periodic table: (a) Boron (b) Neon (c) Rubidium (d) Barium (e) Arsenic

25 . An atom of an element has atomic number 9 and mass number 19.
(a) State the number of protons and neutrons in the nucleus of this atom.
(b) State the number of electrons in this atom.
(c) Show with electron cross-dot diagrams, the formation of ions by this atom.
(d) Write electronic configuration of this element.
(e) Point out its group in the periodic table.
(f) Point out its period in the periodic table.

26 .

Define ion, molecular ion, formula unit, free radical, atomic number, mass number, atomic mass unit.

27 . Calculate the number of moles of each substance in samples with the following masses:
(a) 2.4 g of He (b) 250 mg of carbon
(c) 15 g of sodium chloride (d) 40 g of sulphur
(e) 1.5 kg of MgO

28 .
Calculate the number of molecules present in each of the following samples: (a) 2.5 moles of carbon dioxide (b) 3.4 moles of ammonia, NH_3 (c) 0.01 moles of acetic acid, CH_3COOH

29 .
TNT or trinitrotoluene is an explosive compound used in bombs. It contains 7 C-atoms, 5 H-atoms, 3 N-atoms and 6 O-atoms. Write its empirical formula.

30 .
Indigo ($C_{16}H_{10}N_2O_2$), the dye used to colour blue jeans is derived from a compound known as indoxyl (C_8H_7ON). Calculate the molar masses of these compounds. Also write their empirical formulas.

31 .
Calculate the number of atoms in each of the following samples: (a) 3.4 moles of nitrogen atoms (b) 23 g of Na (c) 5g of H atoms

32 . Balance the following chemical equations:
(a) $Na_{(s)} + H_2O_{(l)} \rightarrow NaOH_{(aq)} + H_{2(g)}$
(b) $NH_{3(g)} \rightarrow N_{2(g)} + H_{2(g)}$

33 . Describe how Avogadro's number is related to a mole of any substance.

34 . Compare and contrast oxidation and reduction.

35 . (a) Define oxidizing and reducing agents.
(b) Identify the oxidizing agents and reducing agents in the following reactions:
(i) $H_2S + Cl_2 \rightarrow 2HCl + S$
(ii) $2\ FeCl_2 + Cl_2 \rightarrow 2\ FeCl_3$
(iii) $2\ KI + Cl_2 \rightarrow 2KCl + I_2$
(iv) $Mg + 2\ HCl \rightarrow MgCl_2 + H_2$

36 . Justify the statement that the process of respiration is crucial for us.

37 . Explain, how does the process of respiration provides us energy?

38 . How does temperature affect cobalt chloride equilibrium?

39 . Identify Bronsted-Lowry acids or bases in the following reactions. (i) $HNO_3 + H_2O \rightarrow H_3O^+ + NO^-_3$
(ii) $NH_3 + HNO_3 \rightarrow NH_4NO_3$

40 .

Identify Bronsted acids and Bronsted bases in the following reaction.
(i) $CH_3COOH_{(aq)} + H_2O \rightleftharpoons CH_3COO^-_{(aq)} + H_3O^+_{(aq)}$
(ii) $HCO^-_{3(g)} + H_2O_{(l)} \rightleftharpoons CO^{-2}_{3(aq)} + H_3O^+_{(aq)}$
(iii) $NH_{3(g)} + H_2O_{(l)} \rightleftharpoons NH^+_{4(aq)} + OH^-_{(aq)}$
(iv) $HCl_{(aq)} + HCO^-_{3(aq)} \rightleftharpoons H_2CO_{3(aq)} + Cl^-_{(aq)}$
(v) $HS^-_{(aq)} + H_2O_{(l)} \rightleftharpoons S^{-2}_{(aq)} + H_3O^+_{(aq)}$

41 . Write equations showing the ionization of the following as Arrhenius acids. (a) $HI_{(aq)}$ (b) $HNO_{2(aq)}$

42 .
Write balanced chemical equations for the following chemical reactions. (i) Sulphuric acid + Magnesium hydroxide → magnesium sulphate + water
(ii) Sulphuric acid + Sodium Carbonate → Sodium sulphate + water
(iii) Hydrochloric acid + Magnesium → Magnesium chloride + hydrogen gas

43 . Give the Bronsted-Lowry definition of an acid. Write an equation that illustrates the definition.

44 .
Write equations showing the ionization of the following as Bronsted-Lowry acids. (a) $HNO_{2(aq)}$ (b) $HCN_{(aq)}$

45 . Describe sources of air pollutants.

46 . Describe global warming.

47 . Describe acid rain and its effects.

48 . Sulphur dioxide is a common pollutant from burning coal. State two effects caused by this pollutant.

49 . Highlights some advantages of natural substances found in water?

50 . Distinguish between distilled water and tap water with their applications in practical chemistry.

51 . Explain the properties of water?with its steps.

52 . Write the disadvantages of natural substances found in water?

53 . Elaborate the main steps for treatment of domestic water supply?

54 . Public health depends on water quality. Give arguments.

55 . Water is known as universal solvent ?justify the statements.

56 . Explain the water born infection diseases?

57 . What is the factors of water scarity in pakistan?

58 . What is meant by the term functional group?

59 .
Identify the type of following compounds as an alcohol, aldehyde or ketone: (b) CH_3COCH_3, which is used in nail polish remover.

60 .

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61 .
Identify the type of following compounds as an alcohol, aldehyde or ketone: (b) CH_3COCH_3, which is used in nail polish remover.

62 . Give the structural formula of two simple alkanes and one alkyne.

63 .
Identify the type of following compounds as an alcohol, aldehyde or ketone: (a) *HCHO*, which is used to manufacture polymers, such as urotropine which is used to treat urinary tract infection.

64 . Discuss methods for the preparation ethane.

65 . Describe properties of alkanes.

66 . Write a chemical equation to show the preparation of an alkane from an alkene and an alkyne.

67 . What are lipids? How are lipids important to our body?

68 .
What percentage of fat is required in a balanced diet? Why is the percentage of fat being lowest in major food components? Justify.

69 .
Imagine you are a nutrtionist task to design a meal plan for athletes participating in a marathon. Explain the role of carbohydrates can effect an athlete's performance during the marathon.

70 . How do you maintain a balanced diet?

71 .
How does scientific notation enhance the ability to communicate about extremely large and small numbers? Convince.

72 . Why do scientific realize the need for a standardized system of measurement?

73 .
What technique would you use to separate sand from water? There are two possibilities. Mention their names.

74 . How to separate a mixture of two solids?

75 . What technique would you use to separate alcohol from water?

76 . How separation of mixtures of two or more liquids is done. Name the separation technique.

77 . Why does hydrogen gas produce a popping voice when it is exposed to the flame?

78 . What is the origin of flame colour?

79 . Differentiate between stationary and mobile phase.

80 . How can you identify an unknown substance by chormatography?