



PRACTICE QUESTIONS

For entrance exam

Medical School, Sarajevo School of Science and Technology

Candidate's name: _____

Department of study: _____

Mark awarded: _____

Chemistry

Multiple choice: Choose the one alternative that best completes the statement or answers the question.

- Which of the following is not a pure substance?
 - Oxygen gas
 - Gold
 - Brass
 - Water
- Which of the following is not a physical property?
 - Colour
 - Smell
 - Flammability
 - Volume
- Which of the following is an example of a chemical change?
 - A sheet of paper is torn into small pieces.
 - Ice cubes melt into liquid water.
 - An iron nail is soaked in water until it rusts.
 - Salt is dissolved in water.
- Which statement best describes a mixture?
 - It has a fixed chemical formula
 - Its components are chemically bonded
 - Its composition can vary
 - It has a sharp melting point
- Elements in the periodic table are arranged according to
 - Atomic mass
 - Number of neutrons
 - Mass number
 - Atomic number
- The luster of a metal is due to
 - Its high density
 - Its high polishing
 - Presence of free electrons
 - Its rigidity
- The major constituent of air is
 - Oxygen
 - Nitrogen
 - Hydrogen
 - Carbon dioxide
- Which compounds do not have the same empirical formula?
 - C_2H_2 , C_6H_6
 - CO , CO_2
 - C_2H_4 , C_3H_6
 - $C_2H_4O_2$, $C_6H_{12}O_6$
 - $C_2H_5COOCH_3$, CH_3CHO
- A molecular formula always indicates _____
 - how many of each atom are in a molecule
 - the simplest whole-number ratio of different atoms in a compound
 - which atoms are attached to which in a molecule
 - the isotope of each element in a compound

10. An empirical formula always indicates _____.
- Which atoms are attached to which in a molecule
 - how many of each atom are in a molecule
 - the simplest whole-number ratio of different atoms in a compound
 - the isotope of each element in a compound
11. What is the chemical symbol for bromine?
- B
 - Be
 - Br
 - Bi
12. What element has the symbol Au?
- Silver
 - Gold
 - Aluminum
 - Americium
13. What is the chemical symbol for potassium?
- P
 - Po
 - K
 - Na
14. Which of the following is an alkaline earth metal?
- Sodium
 - Magnesium
 - Aluminum
 - Silicon
15. Which element should have properties similar to those of sulphur, S?
- Sodium
 - Oxygen
 - Carbon
 - Argon
16. Which element is classified as a metalloid?
- Zinc
 - Nitrogen
 - Iodine
 - Arsenic
17. Which of the following is a transition element?
- Potassium
 - Bromine
 - Chromium
 - Radon
18. There are four isotopes of sulphur: ^{32}S , ^{33}S , ^{34}S , and ^{35}S . Based upon the atomic mass listed in the periodic table, which isotope is the most abundant?
- ^{32}S
 - ^{33}S
 - ^{34}S
 - ^{35}S
19. Which of the following elements has the smallest atomic radius?
- Lithium
 - Boron
 - Carbon
 - Oxygen

20. Which of the following elements has the largest atomic radius?
- Carbon
 - Silicon
 - Germanium
 - Tin
21. The element _____ is the most similar to strontium in chemical and physical properties.
- Li
 - Rb
 - Ba
 - Cs
22. _____ are found uncombined, as monatomic species in nature.
- Noble gases
 - Chalcogens
 - Alkali metals
 - Alkaline earth metals
23. Which group of the periodic table is called halogens
- IIA
 - VIA
 - VIIA
 - VIIIA
24. Which properties are characteristic of nonmetals?
- High electrical conductivity
 - Large ionization energy
 - High electronegativity
 - Low electron affinity
- (i) and (ii)
 - (ii) and (iii)
 - (iii) and (iv)
 - (ii) and (iv)
 - (i), (ii) and (iii)
25. Which statement is true about metals and nonmetals?
- Both conduct electricity equally well
 - Nonmetals are usually ductile
 - Metals tend to lose electrons in reactions
 - Nonmetals form cations
26. Which one of the following does not occur as diatomic molecules in elemental form?
- oxygen
 - nitrogen
 - Sulphur
 - bromine
27. The mass number of a nucleus is
- Always less than its atomic number
 - The sum of the number of protons and neutrons present in the nucleus
 - Always more than its atomic weight
 - A fraction
28. Based on bonding rules, which of the following is not a reasonable formula?
- N₂
 - O₂
 - F₂
 - Ne₂

29. What is the most reasonable Lewis structure for C_2F_2 ?
- $F - C - C - F$
 - $F = C - C = F$
 - $F = C = C = F$
 - $F - C \equiv C - F$
30. Which element is most electronegative?
- N
 - F
 - O
 - C
31. Which compound contains a polar covalent bond?
- HF
 - NaF
 - F_2
 - H_2
32. Consider the following properties of an element:
- It is solid at room temperature.
 - It easily forms an oxide when exposed to air.
 - When it reacts with water, hydrogen gas evolves.
 - It must be stored submerged in oil.
- Which element fits the above description the best?
- sulphur
 - copper
 - mercury
 - sodium
 - magnesium
33. Hydrogen is unique among the elements because _____.
- It has only one valence electron.
 - It is the only element that can emit an atomic spectrum.
 - Its electron is not at all shielded from its nucleus.
 - It is the lightest element.
 - It is the only element to exist at room temperature as a diatomic gas.
- Correct statements are:
- (i), (ii), (iii), (iv) and (v)
 - (i), (iii), (iv)
 - (i), (ii), (iii), (iv)
 - (ii), (iii), (iv)
 - (iii), (iv)
34. All of the following molecules are polar except:
- CO_2
 - H_2S
 - H_2O
 - NH_3

35. Which molecules contain a polar covalent bond(s)?
- (i) CO_2
 - (ii) CCl_4
 - (iii) F_2
 - (iv) KF
- a) (i) and (ii)
 - b) (ii) and (iv)
 - c) (i), (ii) and (iii)
 - d) (ii), (iii) and (iv)
 - e) (i), (ii), (iii) and (iv)
36. Which of the following molecules contain covalent bonds only
- (i) BaCl_2
 - (ii) CCl_4
 - (iii) HCl
 - (iv) NH_3
- a) (i), (ii), (iii) and (iv)
 - b) (i), (ii) and (iv)
 - c) (ii) and (iii)
 - d) (i) and (iii)
 - e) (ii), (iii) and (iv)
37. Ionic bond is likely to form between the atoms of
- (i) C and Br
 - (ii) Ca and I
 - (iii) P and Cl
 - (iv) O and Na
- a) (i) and (ii)
 - b) (ii) and (iii)
 - c) (ii) and (iv)
 - d) (i), (ii) and (iii)
 - e) (i), (ii) and (iv)
38. Benzene, C_6H_6 , is a common solvent. Which of the following substances would be well soluble in benzene:
- (i) NaI
 - (ii) I_2
 - (iii) Margarine
 - (iv) Table salt
- a) (i), (ii), (iii) and (iv)
 - b) (ii), (iii) and (iv)
 - c) (i) and (iv)
 - d) (i) and (ii)
 - e) (ii) and (iii)
39. The number of neutrons in the nucleus of a bromine atom that has a mass number of 80 is
-
- a) 35
 - b) 40
 - c) 45
 - d) 60

40. The number of electrons in an aluminum atom that has a mass number of 27 is _____.
- 12
 - 13
 - 14
 - 27
41. How many orbitals are there in the $3d$ sublevel?
- one
 - three
 - five
 - seven
42. What is the maximum number of electrons possible in energy level 4?
- 34
 - 32
 - 18
 - 16
43. The electron configuration for calcium is _____.
- $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^1$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$
 - $1s^2 2s^2 2p^6 3s^2 3p^5 4s^1 3d^2$
44. What element has the electron configuration of $[\text{Ne}]3s^2 3p^1$?
- B
 - Al
 - Si
 - Sn
45. What is the correct Lewis symbol for Li?
- Li•**
 - Li:**
 - Li•**
 - :Li:**
46. The formula of a salt is XCl_2 . The X-ion in this salt has 28 electrons. The metal X is _____.
- Ni
 - Zn
 - Fe
 - V
47. The number of electrons present in H^+ is
- Zero
 - One
 - Two
 - Three
48. Which atom has the smallest number of neutrons?
- carbon-14
 - nitrogen-14
 - oxygen-16
 - fluorine-19
49. Which atom has the largest number of neutrons?
- chlorine-37
 - potassium-39
 - argon-40
 - calcium-40

50. In the symbol ${}^{13}_6\text{X}$; X=_____.
- C
 - Al
 - K
 - Not enough information to determine
51. How many protons, neutrons and electrons are in the ion ${}^{39}_{19}\text{K}^+$
- 20 protons, 19 neutrons, 19 electrons
 - 19 protons, 20 neutrons, 18 electrons
 - 39 protons, 19 neutrons, 38 electrons
 - 19 protons, 20 neutrons, 19 electrons
52. Which main energy shell can accommodate a maximum number of 8 electrons?
- 1
 - 2
 - 3
 - 4
53. An element has the electronic configuration of $1s^2 2s^2 2p^6 3s^2 3p^2$. The number of valence electrons is _____.
- 2
 - 4
 - 6
 - 12
54. The element that corresponds to the electron configuration $1s^2 2s^2 2p^2$ is _____.
- Lithium
 - Boron
 - Nitrogen
 - Carbon
55. The complete electron configuration of Sulphur, element 16, is _____.
- $1s^2 2s^2 2p^6 3s^2 3p^4$
 - $1s^4 2s^4 2p^6 3s^2$
 - $1s^4 2s^4 2p^8$
 - $1s^6 2s^6 2p^2 3s^2$
56. The element that has a valence configuration of $5s^2 5p^6$ is _____.
- Xe
 - Rn
 - Ne
 - Kr
57. Which of the following represents the numbers of protons and electrons in a bromide ion, Br^- ?
- 35 p^+ and 34 e^-
 - 35 p^+ and 35 e^-
 - 35 p^+ and 36 e^-
 - 36 p^+ and 36 e^-
58. The symbol for the ion formed by sulphur is _____.
- S^{2-}
 - S^{2+}
 - S^{4+}
 - S^{4-}
59. How many protons and electrons are there in the magnesium (Mg^{2+}) ion?
- 12 protons and 14 electrons
 - 10 protons and 12 electrons
 - 12 protons and 12 electrons
 - 12 protons and 10 electrons

60. How many valence electrons does each atom in an NH_3 molecule contribute to the total valence electrons?
- N contributes 3, and each H contributes 1.
 - N contributes 5, and each H contributes 1.
 - N contributes 5, and each H contributes 3.
 - N contributes 7, and each H contributes 1.
61. Magnesium forms an ion with a charge of
- 1+ by losing one electron
 - 1- by losing one electron
 - 2+ by losing two electrons
 - 2+ by gaining two electrons
62. In a reaction where a calcium atom changes into calcium ion, the calcium atom
- Has lost an electron
 - Has become an anion
 - Has been oxidized
 - Has achieved noble gas electron configuration
- (i) and (ii)
 - (ii) and (iii)
 - (iii) and (iv)
 - (ii), (iii) and (iv)
63. Under the symbol of 2SO_3 you may understand:
- 2 moles of SO_3
 - 2 molecules of SO_3
 - 6 moles of O_2
 - $2 \times 6 \times 10^{23}$ atoms of O
- (i) and (ii)
 - (ii) and (iii)
 - (iii) and (iv)
 - (ii) and (iv)
 - (i), (ii) and (iii)
64. The formula for zinc phosphate is $\text{Zn}_3(\text{PO}_4)_2$. What is the formula for cadmium arsenate?
- $\text{Cd}_4(\text{AsO}_2)_3$
 - $\text{Cd}_3(\text{AsO}_4)_2$
 - $\text{Cd}_3(\text{AsO}_3)_4$
 - $\text{Cd}_2(\text{AsO}_4)_3$
65. Which formula/name pair is incorrect?
- $\text{Mn}(\text{NO}_2)_2$ manganese (II) nitrite
 - $\text{Mg}(\text{NO}_3)_2$ magnesium nitrate
 - $\text{Mn}(\text{NO}_3)_2$ manganese (II) nitrate
 - Mg_3N_2 magnesium nitrite
66. Which formula/name pair is incorrect?
- $\text{Fe}_2(\text{SO}_3)_3$ iron (III) sulphite
 - FeS iron (II) sulphide
 - FeSO_3 iron (II) sulphite
 - $\text{Fe}_2(\text{SO}_4)_3$ iron (III) sulphide
67. The correct name for $\text{Ni}(\text{CN})_2$ is _____.
- nickel (I) cyanide
 - nickel cyanate
 - nickel carbonate
 - nickel (II) cyanide

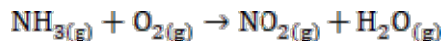
68. The formula magnesium oxide is ____.
- MgO
 - MgO₂
 - Mg₂O
 - Mg₂O₂
69. What is the charge on the Fe ion in the ionic compound with the formula, Fe₂O₃?
- 3-
 - 2-
 - 2+
 - 3+
70. The formula for a compound containing ammonium ion(s) and phosphate ion(s) is ____.
- NH₃PO₄
 - NH₄PO₄
 - (NH₄)₂PO₄
 - (NH₄)₃PO₄
71. The name of the compound SO₃ is ____.
- sulphur oxide
 - sulphur trioxide
 - sulphur (III) oxide
 - sulphite ion
72. Which compound has the atom with the highest oxidation number?
- Na₃N
 - MgSO₃
 - Al(NO₂)₃
 - NH₄Cl
73. In which species does chlorine have an oxidation number of zero?
- Cl₂
 - HClO₄
 - NaClO₃
 - HCl
74. In which species does nitrogen have the highest oxidation number?
- NaNO₃
 - HNO₂
 - NO₂⁻
 - NH₃
75. The oxidation number of Mn in MnO₄⁻ is
- +8
 - 8
 - +7
 - 7
76. What is the oxidation number of Cr in K₂Cr₂O₇
- 6
 - +6
 - 12
 - +12

77. When the following equation is balanced, the coefficients are _____.



- a) 1, 4, 8, 9
- b) 2, 12, 8, 9
- c) 4, 4, 32, 36
- d) 2, 25, 16, 18

78. When the following equation is balanced, the coefficients are _____.



- a) 4, 7, 4, 6
- b) 2, 3, 2, 3
- c) 1, 3, 1, 2
- d) 4, 3, 4, 3

79. When the following equation is balanced, the coefficients are _____.



- a) 2, 3, 1, 6
- b) 2, 1, 3, 2
- c) 4, 6, 3, 2
- d) 2, 3, 2, 3

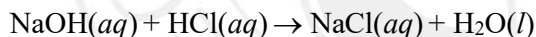
80. Chose the redox reaction

- a) $\text{HNO}_3 + \text{KOH} \rightarrow \text{KNO}_3 + \text{H}_2\text{O}$
- b) $2\text{HNO}_3 + \text{Na}_2\text{CO}_3 \rightarrow 2\text{NaNO}_3 + \text{H}_2\text{O} + \text{CO}_2$
- c) $\text{Ba}(\text{NO}_3)_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{NaNO}_3$
- d) $2\text{HNO}_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{Ca}(\text{NO}_3)_2 + 2\text{H}_2\text{O}$
- e) $2\text{HNO}_3 + 3\text{H}_2\text{S} \rightarrow 2\text{NO} + 3\text{S} + 4\text{H}_2\text{O}$

81. Which of the following reactions can be classified as decomposition?

- a) $\text{CuCO}_3(s) \rightarrow \text{CuO}(s) + \text{CO}_2(g)$
- b) $4\text{Fe}(s) + 3\text{O}_2(g) \rightarrow 2\text{Fe}_2\text{O}_3(s)$
- c) $\text{Mg}(s) + 2\text{AgNO}_3(aq) \rightarrow \text{Mg}(\text{NO}_3)_2(aq) + 2\text{Ag}(s)$
- d) $\text{NaOH}(aq) + \text{HCl}(aq) \rightarrow \text{NaCl}(aq) + \text{H}_2\text{O}(l)$

82. The chemical reaction below is best classified as a _____ reaction.



- a) combination
- b) combustion
- c) single replacement
- d) double replacement

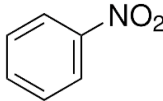
83. Any reaction that absorbs 150 kcal of energy can be classified as

- a) Activated
- b) Exothermic
- c) Oxidation
- d) Endothermic

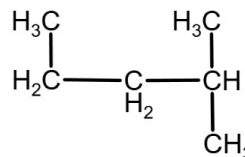
84. Generally, acids taste _____ and produce _____ ions in solution.

- a) sour/ H^+
- b) bitter/ H^+
- c) sour/ OH^-
- d) bitter/ OH^-

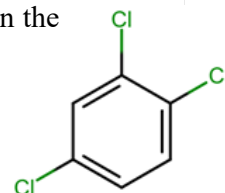
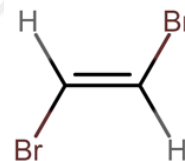
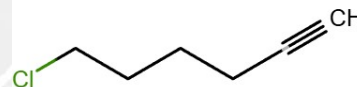
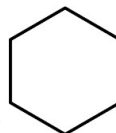
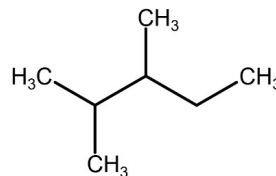
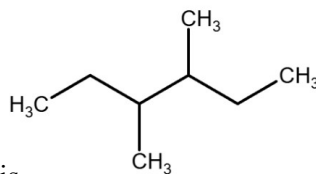
85. Generally, bases taste _____ and produce _____ ions in solution.
- sour/ H^+
 - bitter/ H^+
 - sour/ OH^-
 - bitter/ OH^-
86. Classify each of the following compounds as acids (A), bases (B) or salts (S)
- HCl _____
 - NH_4OH _____
 - CH_3COONa _____
 - $HClO_4$ _____
87. Classify each of the following compounds as acids (A), bases (B) or salts (S)
- K_2CrO_4 _____
 - H_2SO_4 _____
 - $Ba(OH)_2$ _____
 - HI _____
88. The pH of an acid solution is 3. It may be all of the following except:
- 10^{-3} M HCl
 - 10^{-3} M CH_3COOH solution
 - 10^{-3} M HNO_3 solution
 - 5×10^{-4} M H_2SO_4 solution
89. A 0.01 M HCl solution is diluted with water 100 times
- The pH of the solution increases by 2
 - The pOH of the solution increases by 2
 - The hydronium ion concentration of the solution decreases from 10^{-2} to 10^{-4} M
 - The hydroxide ion concentration of the solution does not change
- (i) and (ii)
 - (ii) and (iii)
 - (i) and (iii)
 - (i), (iii) and (iv)
 - (ii), (iii) and (iv)
90. Which statement about acids is correct?
- They produce OH^- ions in water
 - They turn blue litmus red
 - They taste bitter
 - Their pH is always greater than 7
91. Which of the following phases is not capable of acting as the solvent in a solution?
- Solid
 - Liquid
 - Gas
 - All are able to act as a solvent.
92. The air in the classroom is a solution of several gases. Which of the following is most likely to be considered the solvent?
- Oxygen
 - Nitrogen
 - Carbon dioxide
 - Water vapor
93. All of the following solutes are strong electrolytes in aqueous solution except:
- KCl
 - $CaCl_2$
 - CH_3OH_3
 - NaCl

94. Which of the following is an example of a saturated solution?
- A sugar cube completely dissolves when added to a cup of coffee.
 - A layer of sugar forms on the bottom of a glass of tea as ice is added.
 - A spoonful of sugar added to tea dissolves.
 - Two teaspoons of sugar dissolves in coffee
95. The formula weight of the compound, $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ is:
- 394.4
 - 666.4
 - 466.8
 - 561.2
96. The formula weight of ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$, rounded to the nearest integer, is _____ amu.
- 100
 - 118
 - 116
 - 132
97. The structural formula of nitrobenzene is presented below. The molecular weight of this compound is _____ amu.
- 
98. How many moles is in 0,4 g of hydrogen fluoride (HF)
- 1 mol
 - 2 mol
 - 0,02 mol
 - 0,01 mol
99. Calculate the molar mass of pentanol, $\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{OH}$.
- 63 g/mol
 - 88 g/mol
 - 115 g/mol
 - 150 g/mol
100. 100 g of ethanol, $\text{C}_2\text{H}_5\text{OH}$, is dissolved in in 100g of water. The final solution has the volume of 0,2 L. What is the density of the solution?
- 0,5 g/mL
 - 1 g/mL
 - 46 g/mL
 - 64 g/mL
101. What is the concentration (M) of CH_3OH in a solution prepared by dissolving 34.4 g of CH_3OH in sufficient water to give exactly 230 mL of solution?
- 11.9
 - 1.59
 - 4.67
 - 5.31

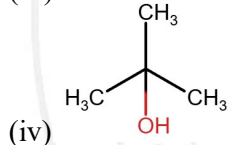
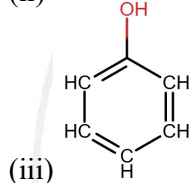
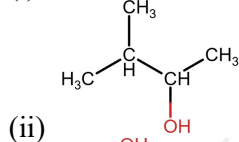
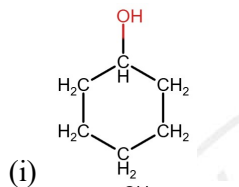
102. An aqueous solution is prepared by dissolving 1,6 g NaOH in 250 mL final volume. What is the molar concentration of the solution?
- 6,4 mol/L
 - 1,6 mol/L
 - 0,16 mol/L
 - 0,64 mol/L
103. 0,08 g NaOH is dissolved in enough water to make 10 mL of solution. Calculate the molar concentration.
- 0,2 M
 - 0,2 mM
 - 20 mM
 - 0,5 M
104. What volume (mL) of a concentrated solution of sodium hydroxide (6.00 M) must be diluted to 185.6 mL to make a 3.23 M solution of sodium hydroxide?
- 99.9
 - 287
 - 0.104
 - 0.0100
105. Which solution contains the largest amount of glucose?
- 0,5 L of 2M solution
 - 1000 mL of 1M solution
 - 0,25 L of 5M solution
 - 1L of 0,1M solution
106. How many grams of H_3PO_4 are in 145 mL of a 3.50 M solution of H_3PO_4 ?
- 0.508
 - 49.7
 - 20.0
 - 4.90
107. Chose the solution with the highest hydronium ion concentration
- pH=2 HCl solution
 - pH=2 acetic acid solution
 - 0,1M HCl solution
 - 0,1M acetic acid solution
108. What is the most basic solution
- pH=11
 - pOH=12
 - pOH=2
 - $[\text{OH}^-]=10^{-4}$ mol/L
109. An unknown solution has an $[\text{H}_3\text{O}^+]$ of 3.8×10^{-9} M. Calculate the $[\text{OH}^-]$ and determine whether the solution is acidic or basic.
- $[\text{OH}^-] = 2.6 \times 10^{-6}$ and is acidic
 - $[\text{OH}^-] = 2.6 \times 10^{-6}$ and is basic
 - $[\text{OH}^-] = 3.8 \times 10^{-5}$ and is acidic
 - $[\text{OH}^-] = 3.8 \times 10^{-5}$ and is basic
110. What is the IUPAC name for the following compound?
- 2,2,4-trimethyl propane
 - 2,2-dimethyl butane
 - 1-isopropyl propane
 - 2-methyl pentane



111. What is the IUPAC name for this alkane?
- 2-ethyl-3-methylpentane
 - 4-ethyl-3-methylpentane
 - 3, 4-dimethylhexane
 - 2, 3-diethylbutane
112. The IUPAC name for the following alkane is _____.
- 2,3-dimethylpentane
 - 3-ethyl-2-methylbutane
 - 3,4-dimethylpentane
 - 2-methyl-3-ethylbutane
113. What is the IUPAC name for a two-carbon alkyl group?
- Methyl
 - Ethyl
 - Propyl
 - Butyl
114. In the name cyclohexane, the prefix *cyclo* means that _____.
- the compound is explosive
 - the carbon atoms are joined in a ring
 - the compound is a derivative of benzene
 - the carbons have a valence of three
115. Compounds that have the same molecular formula but differ in the way the atoms are arranged are called.
- isotopes
 - isomers
 - homologs
 - allotropes
116. What's the IUPAC name of this compound?
- cyclopentane
 - cyclohexane
 - cyclopentene
 - cyclohexene
117. What is the IUPAC name for the following compound?
- 6-chloro-2-pentyne
 - 6-chloro-1-pentyne
 - 1-chloro-5-hexyne
 - 6-chloro-1-hexyne
118. Is the following molecule a cis or trans isomer?
- Cis, because the two Br atoms are on the same side
 - Trans, because the two Br atoms are on the same side
 - Cis, because the two Br atoms are on opposite sides
 - Trans, because the two Br atoms are on opposite sides
119. Which of the following is the correct numbering for the three chlorines on the following molecule?
- 1, 2, 4
 - 1, 2, 5
 - 1, 3, 6
 - 1, 4, 6
120. Thiols have structures similar to alcohols except that they contain
- three alcohol groups.
 - more than one carbon.
 - sulphur in place of oxygen in the functional group.
 - nitrogen in place of oxygen in the functional group.



121. In a tertiary alcohol, how many alkyl groups are attached to the carbon atom bonded to the -OH group?
- None
 - One
 - Two
 - Three
122. What kind of bonds do alcohols form between individual molecules?
- oxygen bonds
 - hydrogen bonds
 - single bonds
 - carbon bonds
123. Choose the compound(s) that are secondary alcohols



- (i), (ii), (iii) and (iv)
 - (i) and (iii)
 - (i) and (iv)
 - (i) and (ii)
 - (ii) and (iii)
124. The name of the functional group of aldehydes and ketones is a _____.
- double bond
 - hydroxyl group
 - carbonyl group
 - carboxyl group
125. Aldehydes differ from ketones in that the carbonyl functional group of _____ are in the primary position while the carbonyl functional group of _____ are in the secondary position.
- aldehydes/ketones
 - ketones/aldehydes
126. How many carbonyl-containing isomers does the formula C_3H_6O have?
- two
 - three
 - five
 - seven

127. How many hydrogen atoms are bonded to the carbon atom with the carbonyl group in a ketone?

- a) None
- b) One
- c) Two
- d) Three

128. What is the method of preparing carboxylic acids from primary alcohols or aldehydes?

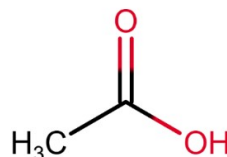
- a) Reduction
- b) Hydration
- c) Oxidation
- d) Saponification

129. The —COOH group is called a(n) _____.

- a) carboxyl group
- b) carbonyl group
- c) aldehyde group
- d) hydroxyl group

130. The IUPAC name and the common name for the following carboxylic acid are _____, respectively.

- a) Methanoic acid and formic acid
- b) Methanoic acid and acetic acid
- c) Ethanoic acid and formic acid
- d) Ethanoic acid and acetic acid

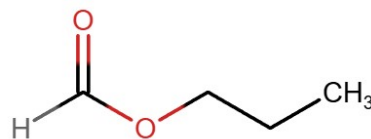


131. The reaction of an ester with NaOH is known as _____.

- a) Esterification
- b) Neutralization
- c) Saponification
- d) Reduction

132. What is the IUPAC name of this compound?

- a) propyl methyl ester
- b) diethyl ester
- c) propyl methanoate
- d) propyl formate



133. Chose the compound with an ester group

- a)
- b)
- c)
- d)

134. Classify the following amine:

- a) primary
- b) secondary
- c) tertiary
- d) quaternary



135. Water soluble amines are _____ and tend to _____ the pH of solutions.

- a) neutral/have no effect
- b) weak acids/lower
- c) weak bases/lower
- d) weak bases/raise

136. The monosaccharide that is also called blood sugar is _____.

- a) Ribulose
- b) Galactose
- c) Glucose
- d) Ribose

137. The polysaccharide that is not digestible by humans is _____.

- a) Glycogen
- b) Cellulose
- c) Amylose
- d) Amylopectin

138. Which of the following is not a major role of lipids?

- a) Membranes
- b) Hormones
- c) Energy storage
- d) Enzymes

139. Which of the following substances classify as lipids?

- (i) Triacyl glycerol
 - (ii) Nucleoside
 - (iii) Steroid
 - (iv) Waxes
- a) (i)
 - b) (i) and (iii)
 - c) (i), (iii) and (iv)
 - d) (ii) and (iii)
 - e) (i), (ii), (iii) and (iv)

140. The type of bond that links amino acids together is a _____.

- a) hydrogen bond
- b) peptide bond
- c) covalent bond
- d) disulfide bond

141. Which of the following functional groups are common in proteins?

- (i) Amide
 - (ii) Phosphodiester
 - (iii) Disulfide
 - (iv) Alkyne
- a) (i)
 - b) (ii) and (iii)
 - c) (i) and (iii)
 - d) (iii) and (iv)
 - e) (i)

142. When a protein is denatured, the structure reverts to _____.
- the individual amino acids that make up the protein
 - the primary structure of the protein
 - an α -helix
 - carbon dioxide and water
143. All of the following could cause a protein to denature except _____.
- adding acid
 - agitation
 - lowering the temperature
 - All of these can denature protein.
144. When a protein is hydrolyzed, the structure reverts to _____.
- the individual amino acids that make up the protein
 - the primary structure of the protein
 - an α -helix
 - carbon dioxide and water
145. A compound that catalyzes a chemical reaction in a living organism is called a(n) _____.
- carbohydrate
 - enzyme
 - lipid
 - vitamin
146. Enzymes belong to which class of organic compounds?
- carbohydrates
 - esters
 - lipids
 - proteins
147. The compound that has a reaction catalyzed by an enzyme is called a(n) _____.
- activator
 - coenzyme
 - cofactor
 - substrate
148. The optimum temperature for most enzymes operating in the human body is _____.
- 273 K
 - 37 °C
 - 98.6 °C
 - 120 °C
149. A polymer made of more than 50 amino acids is usually referred to as a(n):
- tripeptide
 - protein
 - hormone
 - lipid
 - vitamin

150. Classify each of the following according to its functional group

Compound	Classification	Compound	Classification
$\text{H}_2\text{C}=\text{CH}_2$		$\text{HO}-\text{CH}_3$	
$\text{H}_3\text{C}-\text{NH}_2$		$\text{H}_3\text{C}-\text{O}-\text{CH}_3$	
