

FEDERAL REPUBLIC OF SOMALIA

GRADE 12 EXAMS, 2022

CHEMISTRY



OFFICE OF EXAMINATIONS AND CERTIFICATION



Somali Federal Ministry of Education, Culture & Higher Education

Form Four National Standardized Examinations.

MAY / JUNE 2022

SUBJECT: CHEMISTRY

TIME: 2 HOURS

Instructions: Answer all questions in the ANSWER BOOKLET

PPART I: Circle the letter of the correct answer (60 MARKS)

1) The chemical elements that make up carbohydrates are

- | | |
|-------------------------------|------------------------------|
| a. CarBon, hydrogen, nitrogen | c. Sulphur, carbon, hydrogen |
| b. Hydrogen, oxygen, phosphor | d. Carbon, hydrogen, oxygen. |

2) Select the functional group of carboxylic acid from the following

- | | |
|-----------|-----------|
| a. R-O-R | b. R-COOR |
| b. R-COOH | d. R-COR |

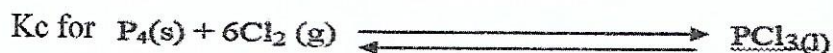
3) An example of an alcohol is

- | | |
|--|--|
| a. $\text{CH}_3\text{-CH}_2\text{-}\overset{\text{O}}{\underset{\text{ }}{\text{C}}}\text{-CH}_2\text{-CH}_3$ | b. $\text{CH}_3\text{-CH}_2\text{-}\overset{\text{OH}}{\underset{ }{\text{CH}}}\text{-CH}_3$ |
| c. $\text{CH}_3\text{-CH}_2\text{-O-CH}_2\text{-CH}_2\text{-CH}_3$ | d. $\text{CH}_3\text{-CHO}$ |

4) Identify in IUPAC the name of this alcohol $\rightarrow \text{HO-CH}_2\text{-}\underset{\text{OH}}{\underset{|}{\text{CH}}}\text{-CH}_2\text{-OH}$

- | | |
|---------------------------|----------------------|
| a. 1,2,3-propanetriol | b. 1,3-propanediol |
| b. 1,2,3,4-propanetetriol | d. 1,2,3-butanetriol |

5) Express the correct answer for the following equilibrium constant.



- | | | | |
|--------------------------------|--------------------------------|--------------------------------|----------------------------------|
| a. $\frac{1}{[\text{Cl}_2]^6}$ | b. $\frac{2}{[\text{Cl}_2]^6}$ | c. $\frac{1}{[\text{Cl}_2]^4}$ | d. $\frac{0.5}{[\text{Cl}_2]^6}$ |
|--------------------------------|--------------------------------|--------------------------------|----------------------------------|

6) Identify the correct name of this organic compound



- | | |
|------------|-------------|
| a. Octanal | c. Octanone |
| b. Octanol | d. Octane. |



7. The Sucrose sugar consists of

- a. Glucose and Galactose
- b. Glucose and Lactose
- c. Glucose and Glycogen
- d. Glucose and Fructose

8. The nitrogenous base Adenine is always pair with...

- a. Guanine
- b. Thymine
- c. Cytosine
- d. Uracil

9. Describe the correct name that implies to this structure →

$$\begin{array}{ccccccc} \text{CH}_2 & - & \text{CH} & - & \text{CH} & - & \text{CH}_2 - \text{CH}_2 - \text{CH} - \text{CH}_3 \\ | & & | & & | & & | \\ \text{OH} & & \text{Br} & & \text{Cl} & & \text{Cl} \end{array}$$

- a. 1-bromo - 3,6- dichloro heptanol.
- b. 3,6 - dichloro heptanol
- c. 2 - bromo - 3,6 - trichloro - 1- heptanal
- d. 2 - bromo - 3,6 - dichloro -1- heptanol

10. The RNA molecule is made up;

- a. single strand
- b. double helix
- c. Double strand
- d. circular strand

11. Which of the following is monosaccharide;

- a. Sucrose
- b. Fructose
- c. Lactose
- d. Glycogen.

12. Which of the following indicates the nuclear reaction;

- a. Translocation
- b. Transmutation
- c. Transmission
- d. Translation

13. On increasing concentration of one or more reactants, more products will be generated until;

- a. Equilibrium
- b. Expansion
- c. Completion of reaction
- d. Closed system

14. The type's reaction in which heat energy absorbed is;

- a. exothermic reaction
- b. equilibrium reaction
- c. endothermic reaction
- d. dynamic reaction

15. Select the organic compound from the following;

- a. Na_2SO_2
- b. K_2CO_3
- c. CaCl_2
- d. $\text{C}_3\text{H}_7\text{O}$

5. Structurally, branched chain alkanes consist of two parts, Parent chain and _____
6. Organic chemistry can be defined as the study of _____
7. the substance which allow electric current to follow through it is referred to _____
8. Electrolyte can further be divided into two types strong electrolyte and _____
9. _____ is a substance that dissolves in water to give hydroxide ion (OH⁻).
10. If the Hydroxyl group(-OH) on the chiral carbon in the fisher projection of monosaccharides is on the right, the sugar is referred to as _____

PART III: Answer All of The Following Questions (30 Marks)

1. Define these terms
 - a. Functional group
 - b. Lipids
2. Draw the structural formula of; 2- methyl-1-pentanol.
3. Give IUPAC name for this structure;



4. What are the structural difference between DNA and RNA?
5. If the $K_c = 1.0$, $[\text{CO}_2] = 2.0\text{M}$, $[\text{H}_2] = 2.0\text{M}$, $[\text{CO}] = 1.0\text{M}$ and $[\text{H}_2\text{O}] = 1.0\text{M}$, for the reaction: $\text{CO}_{(g)} + \text{H}_2\text{O}_{(g)} \rightleftharpoons \text{CO}_{2(g)} + \text{H}_{2(g)}$. What is the Q value for this reaction and which direction will the reaction shifts?
6. State types of radioactive particles.
7. Write the equilibrium constant expression (K_c) for the reaction: $\text{N}_2\text{O}_{4(g)} \rightleftharpoons 2\text{NO}_{2(g)}$.
8. Classify the following hydrocarbons into saturated or unsaturated;
 - a. $\text{CH}_2=\text{CH}-\text{CH}_3$
 - b. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
9. Name and draw the structural formula for the first two members of alkanes.
10. Calculate the PH of hydronium $[\text{H}_3\text{O}^+] = 2.3 \times 10^{-2}$