

CODE : A-C337113-A

I Semester Exam - 2022-23**3 x 840**

Std. : XI

Sub. : CHEMISTRY

Marks : 50

Date : 25/11/2022

Roll No. _____

Time : 2 hrs.

General Instructions :-

- 1) Question paper is divided into four sections.
 - i) Section A :- Q.No.1 contains 7 multiple choice type of questions carrying one mark each.
Q.No. 2 contains 7 very short answer type of questions carrying one mark each.
 - ii) Section B :- Q.No.3 to Q.No.13 are short answer -I type of questions carrying two marks each.
 - iii) Section C :- Q.No. 14 to Q.No.19 are short answer-II type of questions carrying three marks each.
 - iv) Section D :- Q.No.20 to Q.No.23 are long answer type of questions carrying four marks each.
- 2) State each section on new page.
- 3) For each MCQ, correct answer must be written along with its alphabet.
- 4) Evaluation of each MCQ would be done for the first attempt only.
- 5) Use of log table is allowed. Use of calculator is not allowed.
- 6) Atomic weights :- H = 1, C = 12, N = 14, O = 16.
- 7) Draw neat labelled diagrams, and write balanced chemical equations wherever necessary.

Section - A**Q.1 Select and write the correct answer.** **7**

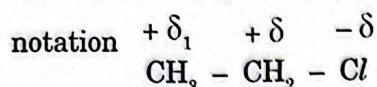
- 1) Butanone is a four carbon compound with the functional group _____.
 - a) Ketone
 - b) Carboxylic acid
 - c) aldehyde
 - d) alcohol
- 2) Which of the following compound has highest boiling point.
 - a) n-pentane
 - b) isobutane
 - c) Butane
 - d) neopentane
- 3) Which of the following is a non-benzenoid aromatic compound ?
 - a) Naphthalene
 - b) Anthracene
 - c) Biphenyl
 - d) Furan
- 4) 11.2 cm³ of hydrogen gas at STP contains _____.
 - a) 0.0005
 - b) 0.01
 - c) 0.029
 - d) 0.5
- 5) 7 gram of N₂ reacts with 3 gram of H₂ as per the reaction $N_2 + 3H_2 \longrightarrow 2NH_3$
The limiting reagent in this reaction is _____.
 - a) N₂
 - b) NH₃
 - c) H₂
 - d) Both N₂ & H₂
- 6) For an anion X⁻³, the mass number is 14. If anion has 10 electrons then the number of neutrons in X₂ nucleus is _____.
 - a) 10
 - b) 14
 - c) 7
 - d) 5
- 7) Which of the following compounds demonstrates the law of multiple proportion ?
 - a) Na₂S, NaF
 - b) CuSO₄, FeSO₄
 - c) NaCl, NaBr
 - d) CO, CO₂

P.T.O.

Q.2 Answer the following.

7

- 1) Which type of Hybridization is observed in carbon of benzene?
- 2) An electronic displacement in the covalent bond is represented by the following



Identify the effect

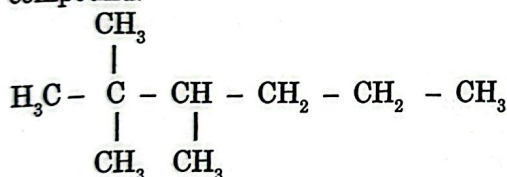
- 3) Write the name of the functional group of $\begin{array}{c} -\text{C}-\text{Cl} \\ || \\ \text{O} \end{array}$

- 4) State Heisenberg uncertainty principle.
- 5) Perform the following operations :-
 $1.05 \times 10^{-4} - 9.7 \times 10^{-5}$
- 6) State Avogadro's Law
- 7) Round of 0.06700 to three significant figures.

Section - B**Attempt any Eight of the following :-**

16

- Q.3** Identify primary, secondary, tertiary and quaternary carbon in the following compound.



- Q.4** Distinguish between Nucleophiles and Electrophiles.
- Q.5** Define :- a) Free radical
b) Electromeric effect
- Q.6** Draw structures representing staggered and eclipsed conformation of ethane using Newman projection.
- Q.7** Write a short note on Pyrolysis of alkanes.
- Q.8** Differentiate between aromatic and aliphatic compounds.
- Q.9** What are the limitations of Bohr's atomic model ?
- Q.10** Which of the following contains more number of atoms?
i) 14 u of Carbon ii) 2.4 gm of Carbon
- Q.11** In one experiment 100 gm of metal ore when roasted, found to liberate 22.8 litres of sulphur dioxide. If the actual volume of SO_2 that should be liberated is 23.09 litres, calculate the absolute error and relative error.
- Q.12** Write electronic configuration of the following elements in box diagram.
i) $_{15}\text{P}$ ii) $_{22}\text{Ti}$
- Q.13** Which of the following gas occupies higher volume at STP?
a) 6.022×10^{24} atoms of Helium.
b) 0.2 moles of Helium.

Section - C

Attempt any FOUR of the following :-

12

- Q.14** i) Write physical properties of alkenes.
ii) Define geometrical isomerism.
- Q.15** i) What is the action of the following on ethyl iodide.
a) Alcoholic KOH b) Zn, HCl
ii) Write any two uses of acetylene.
- Q.16** Find out the type of isomerism exhibited by the following pairs.
i) $\text{CH}_3 - \text{CH}_2 - \text{NH} - \text{CH}_2 - \text{CH}_3$
 $\text{CH}_3 - \text{NH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
ii) $\text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CH}_3$
 |
 OH
 $\text{CH}_3 - \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_3$
iii) $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_2 - \text{CH}_3$
 $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{C} \equiv \text{CH}$
- Q.17** i) Find the formula mass of $\text{Cu}(\text{NO}_3)_2$.
ii) Calculate the average atomic mass of argon from the following data :

Isotope	Isotopic mass (u)	Abundance
^{36}Ar	35.967	0.337 %
^{38}Ar	37.962	0.063 %
^{40}Ar	39.962	99.600%

- Q.18** An organic compound containing oxygen, carbon, hydrogen and nitrogen contains 20% carbon, 6.7 % hydrogen and 46.67 % nitrogen. Its molecular mass was found to be 60. Find the molecular formula of the compound.
[Atomic mass C = 12, H = 1, N = 14, O = 16]
- Q.19** i) If $n = 2$, what are the values of quantum number 'l' and 'm' ?
ii) Write orbital notations for electrons in orbitals with the following quantum numbers.
a) $n = 2, l = 1$
b) $n = 3, l = 2$

Section - D

Attempt any TWO of the following :-

8

- Q.20** i) State and explain Markovnikov's rule with suitable example
ii) Explain homolytic cleavage with suitable example.
- Q.21** i) Distinguish between Carbocation and Carbanion.
ii) Define Homologous series.
iii) Write the IUPAC name of the following bond line structure.



- Q.22** i) Give scientific reason, why 4s orbital is filled before 3d orbital.
ii) The electronic configuration of oxygen is written as $1s^2 2s^2 2p_x^2 2p_y^1 2p_z^1$ and not as $1s^2 2s^2 2p_x^2 2p_y^2 2p_z^0$. Explain.
- Q.23** i) How many litres of oxygen at STP are required to burn completely 2.2 gm of propane, C_3H_8 ? [At. wt. C = 12, H = 1]
ii) Calculate number of moles and volume at STP for 3.4 gm of ammonia (NH_3) gas.