SAMPLE QUESTION PAPER

FIRST YEAR HIGHER SECONDARY EXAMINATION, MARCH 2023

CHEMISTRY

Part – III Time : 2 Hrs.

Cool-off time : 15 Minutes.

General Instructions to Students

- There is a 'cool-off time' of 15 minutes in addition to maximum writing time.
- Use cool-off time to get familiar with questions and to plan your answers.
- Read the instructions carefully.
- Read questions carefully before answering.
- Calculations, figures, graphs should be shown in the answer sheet itself.
- Give equations wherever necessary.
- Electronic devices except non-programmable calculators are not

allowed in the Examination Hall.

Write any 4 questions from 1-5. Each carries 1 score. (4×1=4)

1. No of electrons present in O_2^2 is…… (1)

   a) 18 c) 16

   b) 10 d) 20

2. Hydrogen bond is present in..... (1)

   a) HCl c) H_2O

   b) H_2S d) HBr

3. Write the IUPAC name of element with atomic number 114… (1)

4. Select the Lewis base from the following (1)

   a) $AlCl_3$ c) NH_3

   b) BF_3 d) $BeCl_2$

5. Complete the reaction (1)

$$3\ CH \equiv CH \xrightarrow[873K]{red\ hot\ iron}$$

Answer any 8 questions from 6-15. Each carries 2 scores. (8×2=16)

6. The electron gain enthalpy of F is less than that of Cl. Explain (2)

7. The first ionisation enthalpy of N is greater than that of oxygen. Why?(2)

8. " Shape of a molecule is determined by the no of electron pair present around the central atom"

   i. Using VSEPR theory Explain the structure of H_2O (2)

9. a)State first law of thermodynamics. (1)

b)Give the mathematical equation of First law of thermodynamics. (1)

10. . Define disproportionation reaction. Give an example. (2)

11. Give the structures

a) 3-Ethyl-4,4-dimethyl octane (1)

b) 6-Methyloctan-2-ol (1)

12. How will you identify the presence of halogen by using sodium fusion extract. (2)

13. State Huckel's rule of aromaticity (2)

14. Carbon and Oxygen Combine to Form CO_2 and CO.

a) Identify the above law (1)

b) State the law (1)

15. What are buffer solutions? Give an example for acidic buffer. (2)

Answer Any 8 questions from 16-26. Each carries 3 scores. (8×3=24)

16. Enthalpy and Entropy changes of a reaction are 40.63 KJ/mol and 108.8 JK^{-1} mol^{-1}. Predict the feasibility of the reacion at 300K (3)

17. Balance the following redox reaction by Oxidation number method (3)

$Fe^{2+} + Cr_2O_7^{2} \longrightarrow Fe^{3+} + Cr^{3+}$

18. Which possess more dipole moment NH_3 or NF_3. Give Reason. (3)

19. a) State modern periodic law (1)

b)What are isoelectronic species (1)

c) Select isoelectronic species from the following (1)

$Li, Na^{+}, O^{2}, F, Mg^{2+}$

20. Give three types of structural isomers with examples (3)

21. Explain

a) Inductive effect (1)

b) Homolytic fission (1)

c) Nucleophile (1)

22. a) State Le-Chatelier Principle (1)

b) Applying the principle explain the effect of temperature and pressure for the following reaction (2)

$N_2 + 3H_2 \Leftrightarrow 2NH_3 \quad \triangle H$

23. a) What is de -Broglie's wavelength of 75g of ball moving with a speed of 42 m/s (2)

b) Give the mathematical expression for Heisenberg uncertainty principal. (2)

24. Complete the reaction

a) $2CH_3Cl + 2Na \xrightarrow{dry\ ether}$ (1)

b) $CH_3\text{-}CH_2\text{-}Br \xrightarrow{alc\ KOH}$ (1)

c) $CH_3\text{-}CH{=}CH_2 + HBr \xrightarrow{peroxide}$ (1)

25. a) Draw Newman's projection of eclipsed and staggered conformation of ethane. (2)

b) Which one is more stable staggered or eclipsed. (1)

26.a) write any two merits of Bohr atom model. (1 1/2)

b) write any two demerits of Rutherford's atomic model. (1 1/2)

Answer any 4 question from 27-31. Each carries 4 scores. (4×4=16)

26. a) Define pH. The pH of a soft drink is 2.42 Give the nature of the solution (2)

b) An aqueous solution of $CuSO_4$ is acidic while that of $Na_2SO_4$is basic. Explain (2)

27. a) Classify the following into intensive and extensive (2)

Internal energy , Entropy ,Temperature ,Density

b)State Hesse's law of constant heat summation. Illustrate the law. (2)

28. a) Find the empirical formula and molecular formula of an organic compound from the data given below. (3)

C=75.92% H=6.32% N= 17.76%

The vapour density of compound is 39.5.

(C=12, H=1, N=14)

b) define Limiting reagent. (1)

29. a) Complete the table (1)

Molecule	**Hybridizations**
CH_4	
BF_3	

b) Give the molecular orbital configuration of N_2 (2)

c) Define bond order (1/2)

d) Explain Magnetic behaviour of N_2 using MO configuration. (1/2)

30. a) Name the four quantum numbers (2)

b) Find the quantum numbers of last electron of Na atom (1)

c) n=2, l=2 why this quantum no is not possible (1)

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