ST. GREGORIOS SCHOOL, DWARKA
UNIT TEST- 1(2025-26)

Chemistry (043)

DATE: 28.07.2025
CLASS: XI – B

MM: 30
TIME: 1 hr

GENERAL INSTRUCTIONS

1. All questions are compulsory.
2. Question paper is divided into four sections - A, B, C and D
3. Read the questions carefully and answer as its required.

SECTION A - 1mark questions

(1x6 = 6 marks)

A. FILL IN THE BLANKS

1. General electronic configuration for f-block elements is----------
2. The ionic radius of Anion is generally --------- than parent atom.
3. ---------- is temperature independent unit for measuring concentration of solution.
4. The electronic configuration of a dipositive ion M^{+3} is 2, 8, 13 and its atomic mass is 56. What is the number of neutrons in its nucleus----------

B. WRITE THE SUITABLE ANSWER

5. Assertion(A) : Electron affinity of fluorine is greater than chlorine.
   Reason(R) : Ionisation potential of fluorine is less than chlorine.

6. The total number of electrons in 8.4 g of N^{3-} ion in terms of N_A (N_A is the Avogadro's number)

SECTION B - 2 marks questions

(2x3 = 6 marks)

7. An organic compound containing carbon 40.68% and Hydrogen 5.06%. The vapour density of the compound is 59. Calculate the molecular formula of the compound.

8. Arrange and justify your reason
   (a) Elements Na, Al, Mg, K in the increasing order of metallic character.
   (b) Elements N, P, O and S in the increasing order of acidic nature.

9. Calculate the frequency, wave number and energy associated with photon of radiations having wavelength 4200A°

SECTION C - 3 marks questions

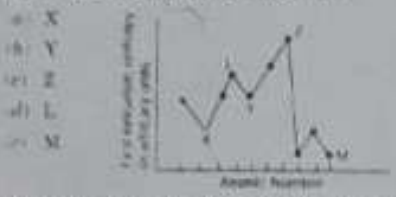
(3x2 = 6 marks)

C. CASE STUDY BASED QUESTIONS

10. The periodic properties also influence the chemical reactivity of the elements in the periodic table. The metallic character of the elements decreases from left to right while the non-metallic character increases. Similarly, the oxidizing property of the elements increases along a period while reducing property decreases. The periodic properties also influence the reactivity down a group. For example, the metallic character of the elements increases down the group. In case of metals, the reactivity generally increases down the group while in nonmetals, it tends to decrease.

(a)Write the general electronic configuration for f-block elements.

(b)In the graph below, the one which represents an alkali metal with the higher atomic number is. Justify your answer.



(c) Predict the position of the element in the periodic table satisfying the electronic configuration $(n-1)\,d^5\,ns^2$ for n = 5.

11. Atoms and Molecules are so small in size that it is neither possible to count them individually nor possible to determine their mass. These are counted collectively in terms of Avogadro's number. The mass of Avogadro's number of atoms and molecules is known as gram atomic mass and gram molecular mass respectively. The volume occupied by Avogadro's number of molecules of a gas or vapours is known as molar volume.

(i) The number of water molecules in a drop of water, if 1 ml of water has 20 drops and A is the Avogadro's number is

(a)0.5 A / 18 (b)0.05A (c)0.5 A (d)0.05A/18

(a) The total number of electrons in 3.2g of methane is----------

(b) If 3.01×10^{23} molecules are removed from 196mg of H_2SO_4, then the number of moles of H_2SO_4 left will be----------

SECTION D - 4 marks questions

(4x3 = 12marks)

12. (a) Out of O and S which one will have more negative electron gain enthalpy and why?

(b)The first and second ionization enthalpies (KJ/mol) of three elements I, II, III are given below:

	I	II	III
$\Delta H_{ion\,1}$	349	494	1142
$\Delta H_{ion\,2}$	2640	1060	2080

Identify the elements likely to be from above table:

(i) An alkaline earth metal
(ii) A nonmetal
(iii) an alkali earth metal (1+3)

13. (a) The density of 3 molal aqueous solution of NaOH is 1.25g/L. Calculate the molarity of the solution.

(b On analysis, a substance was found to have the following percentage composition:

K = 31.84, Cl = 28.98, O = 39.18

Calculate its molecular formula if its molecular mass is 122.5.). (2+2)

12. (a)Calculate the wavelength, frequency and wave number of light wave whose time period is 2.0×10^{-10}s.

(b)The mole fraction of Benzene in a solution with toluene($C_6H_5CH_3$) is 0.50. Calculate the mass percentage of Benzene in the solution. (2+2)

.....