INTERNATIONAL INDIAN SCHOOL, RIYADH
First Term Examination 2015-16
SET- B

Class- XI **Time- 3hrs.**
Sub. – Chemistry **Marks- 70**

General Instructions:

- Questions 1 to 5 are very short answer questions carrying 1 mark each.
- Questions 6 to 10 are short answer questions carrying 2 marks each.
- Questions 11 to 22 are short answer questions carrying 3 marks each.
- Question 23 is value based question carrying 4 marks.
- Questions 24 to 26 are long answer questions carrying 5 marks each.
- There is no overall choice for questions. However internal choices have been provided for one 2 mark questions, one 3 mark question and for all questions carrying 5 marks.
- Use of calculator is not allowed. However log tables can be used if necessary.

1. State the law of definite proportion.
2. Give the general electronic configuration of f-block elements.
3. What is intra-molecular hydrogen bonding?
4. Write the electronic configuration of Cr (Z=24).
5. Assign the position of the element having the outer electronic configuration $ns^2\ np^3$ (n=3).
6. Draw the shapes of p orbitals.
7. Consider the following species :
   N^{3-}, O^{2-}, F^-, Na^+, Mg^{2+} and Al^{3+}
   (a) What is common in them?
   (b) Arrange them in the order of increasing ionic radii.
8. Complete the following reactions .
   $Na_2O + H_2O \rightarrow$
   $Cl_2O_7 + H_2O \rightarrow$
9. a. The number of electrons, protons and neutrons in a species are equal to 18, 16 and 16 respectively. Assign the proper symbol to the species.
   b. What would be the IUPAC name and symbol for the element with atomic number 107?
10. Conc. HCl is 38% by mass. What is the molarity of this solution if density is 1.19 g cm^{-3}.

    Or

    Chlorine is prepared in the laboratory by treating manganese dioxide (MnO_2) with aqueous hydrochloric acid according to the reaction,
    $4\ HCl\ (aq) + MnO_2(s) \rightarrow 2H_2O\ (l) + MnCl_2(aq) + Cl_2\ (g)$
    How many grams of HCl react with 5.0 g of manganese dioxide?
11. A compound contains 4.07 % hydrogen, 24.27 % carbon and 71.65 %

chlorine. Its molar mass is 98.96 g. What are its empirical and molecular formulas ?

12. a.How many significant figures are present in the following?
(i) 0.0025 (ii) 2.0034
b.How are 0.50 m Na_2CO_3 and 0.50 M Na_2CO_3 different?

13. a.What is the lowest value of n that allows g orbitals to exist?
b.How many electrons in an atom may have the given quantum numbers? $n = 4$, $m_s = -1/2$
c.Which series of lines of the hydrogen spectrum lie in the visible region?

14. Dinitrogen and dihydrogen react with each other to produce ammonia according to the following chemical equation:
$N_2(g) + H_2(g) \rightarrow 2NH_3(g)$
(i) Calculate the mass of ammonia produced if 2×10^3 g dinitrogen reacts with 1×10^3 g of dihydrogen.
(ii) Will any of the two reactants remain unreacted?
(iii) If yes, which one and what would be its mass?

15. a.Draw the resonating structures and the resonance hybrid of CO_3^{2-}.
b. Describe the change in hybridisation (if any) of the Al atom in the following reaction.
$AlCl_3 + Cl^- \rightarrow [AlCl_4]^-$

16. A. Give reason
(i) Be has higher $\Delta_i H$ than B.
(ii) Electron gain enthalpy of F is less negative than that of Cl.
B. How would you justify the presence of 18 elements in the 5th period of the Periodic Table?

Or

a.Considering the atomic number and position in the periodic table, arrange the following elements in the increasing order of metallic character : Si, Be, Mg, Na, P.
b.Define i.Diagonal relationship
ii.Electronegativity

17. Draw the shapes and name the geometries of the given molecules
i) BF_3 ii)ClF_3

18. a. Which out of NH_3 and NF_3 has higher dipole moment and why ?
b.Although geometries of NH_3 and H_2O molecules are distorted tetrahedral, bond angle in water is less than that of ammonia. Discuss.

19. Write the IUPAC names of the following.
I. $CH_3CH_2COCH_2COOH$ II. $BrCH_2CH_2CH_2CH_2CH_2OH$