

Model Question Paper
Periodic Classification - II - Part I

12th Standard

Chemistry

Reg.No. :

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I. Answer all the questions.

II. Use Blue pen only.

Time : 00:45:00 Hrs

Total Marks : 60

5 x 1 = 5

Section-A

- 1) The value of C-C distance found experimentally in a saturated hydrocarbon is
(a) 1.34 \AA (b) 1.36 \AA (c) 1.54 \AA (d) 1.56 \AA
- 2) On moving down the group, the radius of an ion
(a) Decreases (b) Increases (c) No change (d) None of these
- 3) Effective nuclear charge (Z^*) can be calculated by using the formula
(a) $Z^* = Z - S$ (b) $Z^* = Z + S$ (c) $Z^* = S - Z$ (d) $Z = Z^* - S$
- 4) Pick the correct statement
(a) Carbon having more nuclear charge than boron (b) The size of carbon atoms is larger than boron (c) Carbon forms electron deficient compounds
(d) Carbon forms ionic compounds
- 5) Comparing the ionisation energy of fluorine with carbon, fluorine has
(a) higher ionisation energy (b) lower ionisation energy (c) same ionisation energy (d) none of these

Section-B

- 6) Arrange the following species in the increasing order of size a) $O^{2-}, F^-, Mg^{2+}, Na^+$ b) F, F^- c) N, O d) Fe^{2+}, Fe, Fe^{3+}
e) Na^+, Cl^-, Na, Cl f) I, I^+, I^-
- 7) Arrange the following elements in the increasing order of their first ionisation potentials, give proper explanation for your answer. a) Li, Be, B b) N, O, F c) C, N, O, F
- 8) Which element of the following has the highest ionisation potential? Na, Cl, Si and Ar.
- 9) Describe with reasons which atom in each of the following pairs has higher ionisation energy? a) Mg and Al b) B and Al c) Al and Si

4 x 3 = 12

Section-C

- 10) Calculate the electronegativity values of fluorine and chlorine on Mulliken's scale, made more nearly Pauling scale, given that the Ionisation potential of F = 17.4 eV/atom, Electron affinity of F = 3.62 eV/atom, $(IP)_{Cl} = 13.0$ eV/atom and $(EA)_{Cl} = 4.0$ eV/atom.
- 11) Calculate the effective nuclear charge experienced by the 4s electron in potassium atom.
- 12) Calculate the effective nuclear charge of the last electron in an atom whose configuration is $1s^2 2s^2 2p^6 3s^2 3p^5$
- 13) Calculate the ionic radii of K^+ and Cl^- ions in KCl crystal. The internuclear distance between K^+ and Cl^- ions are found to be 3.14 \AA .
- 14) Calculate the electronegativity of chlorine from the following data
 $E_{H-H} = 104 \text{ K cal mol}^{-1}$; $E_{Cl-Cl} = 36 \text{ K cal mol}^{-1}$; $E_{H-Cl} = 134 \text{ K cal mol}^{-1}$

4 x 5 = 20

Section - D

- 15) a) The C-Cl bond length is 1.76 \AA , the covalent radius of chlorine is 0.99 \AA . Calculate the radius of carbon.
b) Calculate the C-Cl bond length from the following data $d(C-Cl) = 1.98 \text{ \AA}$ $d(C-C) = 1.54 \text{ \AA}$.
- 16) a) Calculate the effective nuclear charge of the electron in hydrogen atom.
b) Calculate the effective nuclear charge of the last electron in helium atom.

2 x 10 = 20
