FIRST TERMINAL EXAMINATION, OCTOBER 2013

TIME : 8.30 a.m. to 10.30 a.m. | F.Y.J.C. | DAY : Saturday

MARKS: 50 | CHEMISTRY | DATE : 26.10.2013

N.B. :
1. Figures to the right hand side indicate marks.
2. Answers to both the sections should be written on the same answer sheet.
3. Use of log table is allowed.
4. Write chemically balanced equations and draw neat labelled diagrams wherever necessary.
5. All questions are compulsory.

SECTION - I

Q.I Select and write the most appropriate answer from the given alternatives for each sub - questions. (5)

1. Unit of viscosity coefficient is .....

   a. Nm^{-2} b. Nsm^{-2}

   c. Nm^{-1} d. Kgm^{-3}

2. The relation between Kc and Kp for the reaction $A_{(g)} + B_{(g)} \rightleftharpoons C_{(g)} + D_{(g)}$ is,

   a. $Kc = 1/Kp$ b. $Kp = Kc^2$

   c. $Kc = 1/\sqrt{Kp}$ d. $Kp/Kc = 1$

3. Oxidation number of Cl in $KClO_3$ is .....

   1. -1 b. -5

   c. +1 d. +5

4. An electron has principal quantum number 2. The number of sub - shells & orbitals would be respectively,

   a. 2 and 4 b. 2 and 7

   c. 2 and 3 d. 2 and 5

5. Oxidising agent is a species that .....

   a. accept electrons b. donate electrons

   c. transfer electrons d. losses electrons

Q.II Answer any FOUR of the following.

1. Derive Ideal gas equation. (2)
2. State & explain Hund's rule of maximum multiplicity. (2)
3. What is hydrogen bonding? Represent with the help of neat diagrams hydrogen bonding in any two molecules. (2)
4. Define the terms: a. Oxidation number b. Diffusion (2)

5. Distinguish between Reversible and Irreversible chemical reaction. (2)

6. Explain the effect of increase in temperature on the following reaction: (2)

i. $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)} - 181\ KJ$

ii. $2CO_{(g)} + O_{2(g)} \rightleftharpoons 2CO_{2(g)} + 564\ KJ$

Q.III Answer any FOUR of the following.

1. Find the oxidation numbers of underlined species in the following compounds / ions. (3)

i. $NaH\underline{C}O_3$ ii. $K_2\underline{Cr}_2O_7$ iii. $\underline{S}_4O_6^{2-}$

2. a. State any four postulates of Bohr's theory of an atom. (3)

b. Explain two drawbacks of Bohr's theory.

3. a. Identify oxidizing and reducing agent in the following redox reaction. (3)

$\overset{+1}{Cu}_{(aq)} + IO_{3(aq)} \rightarrow \overset{+2}{Cu}_{(aq)} + I_{2(aq)}$

b. State & explain Boyle's law.

4. The volume of a given mass of a gas at 0°C is $2dm^3$. Calculate the new volume of the gas at constant pressure where: (3)

i. the temperature is increased by 10°C.

ii. the temperature is decreased by 10°C.

5. i. Write electronic configuration of Nickel with atomic number 28. (3)

ii. Draw neat diagrams of s and p orbitals.

6. State Law of Mass Action. Derive Mathematical expression of law of mass action. (3)

SECTION - II

Q.IV Select and write the most appropriate answer from the given alternatives for each sub - questions. (5)

1. During electrolysis of sodium chloride in Castner -Kellenel cell, gas evolved at anode is .....

a. Chlorine b. Oxygen

c. Ozone d. Hydrogen

2. The number of primary, secondary and tertiary carbon atoms in 2, 4 - dimethy / pentane are respectively .....

a. 1, 2, 4 b. 2, 1, 4

c. 1, 4, 2 d. 4, 1, 2

3. Which of the following is a benzenoid aromatic compound?

a. Anthracene b. Pyridine

4. The process of Fractional crystallisation is based on the principle of -

a. Evaporation b. Condensation

c. Volatality d. Solubility difference

5. The number of electrons in the outermost orbital of alkaline earth metals is / are

a. 1 b. 2

c. 3 d. 4

Q.V Answer any FOUR of the following.

1. How is benzene prepared from (2)

a. Phenol b. Sodium benzoate

2. Distinguish between crystalline and Amorphous solids. (2)

3. Write down the structures of the following functional groups. (2)

a. Amino b. Carboxyl

c. Hydroxyl d. Ether

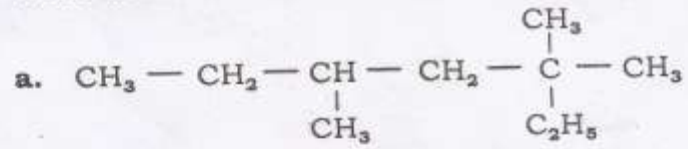
4. a. Why is aqueous solution of $NaHCO_3$ alkaline? (2)

b. Mention any two uses of sodium.

5. a. How is CaO prepared from lime-stone? (2)

b. What is the biological importance of calcium?

6. Write down the I.U.P.A.C. names of the following compounds- (2)

a. 

b. Iso - pentane

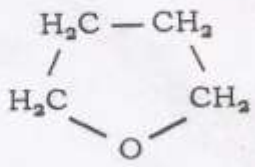
Q.VI Answer any FOUR of the following.

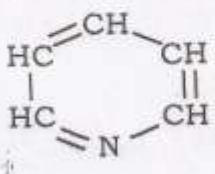
1. Define Resonance. Distinguish between Homolytic and Heterolytic fission. (3)

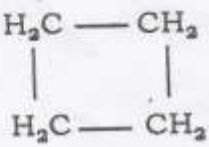
2. How will you convert benzene into . (3)

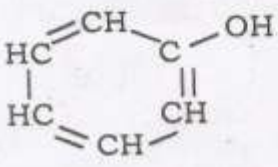
a. Ethyl benzene b. Nitrobenzene c. Cyclohexane

3. Classify and Identify the following compounds as Alicyclic, Hetero - aromatic, Aromatic and Hetero - alicyclic (3)

a. 

b. 

c. 

d. 

Write down the electron - dot formula of ethane.