B. N. Bandodkar College of Science, Thane.
Junior College
F.Y.J.C. 1st Term Examination, October 2014
Subject – Chemistry I and II

Day: Friday **Time: 11.00 am to 01.00 pm**
Date: 10/10/2014 **Max. Marks: 50**

Note: 1) Answers to the two sections should be written in same answer papers.
2) Figure to the right indicates full marks.
3) Draw neat labelled diagrams and write chemically balance equations wherever necessary.
4) Use of log table is allowed.

Section I

Q.1 **Select and write the most appropriate answer from the given alternatives for each sub – question:** **05**

1. For the azimuthal quantum number l = 2, the maximum number of electrons will be __
   a) 10 b) 14 c) 6 d) 8
2. Reducing agent is a species that _____
   a) donate electrons b) losses electrons c) accept electrons d) transfer electrons
3. The equilibrium $H_2O_{(l)} \rightleftharpoons H^+_{(aq)} + OH^-_{(aq)}$ is _____
   a) Mechanical b) Physical c) Static d) Dynamic
4. The chemical reaction in which heat is absorbed is called an _____ reaction.
   a) Exothermic b) Homogenous c) Heterogenous d) Endothermic
5. The intermolecular forces of attraction in liquid state of helium is _____.
   a) dipole – dipole interaction b) dispersion forces
   c) dipole – Induced dipole interaction d) Ion – dipole interaction

Q.2 **Answer *any FOUR* of the following:** **08**

1. State and explain Gay – Lussac's law.
2. Define: a) Chemical equilibrium b) Isobars
3. Draw neat diagram of s and p orbitals.
4. Define : a) Vapour pressure b) Oxidant
5. Distinguish between Reversible and Irreversible reaction.
6. Derive Ideal gas equation.

Q.3 **Answer *any FOUR* of the following:** **12**

1. Write any four postulates of Bohr's theory of an atom. Explain Zeeman effect.
2. Find the,oxidation number of underlined species in the following compounds.
   a) $K_2\underline{Cr}_2O_7$ b) $\underline{V}_2O_7^{4-}$ c) $Na_2\underline{C}O_3$
3. State Aufbau principle. Arrange the following orbitals in the order of their increasing energies.
   6s 3p 4p 1s 2p 4f 3s 2s 3d 5s
4. State law of Mass action. Derive an expression for equilibrium constant, Kc.
5. 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
   i) the temperature is increased by 100°C ii) the temperature is decreased by 100°C
6. **a)** Identify oxidizing and reducing agent in the following recation.
   i) $Zn_{(s)} + 2HCl_{(aq)} \rightarrow ZnCl_{2(aq)} + H_{2(g)}$ ii) $Sn^{2+}_{(aq)} + IO^-_{4(aq)} \rightarrow Sn^{4+}_{(aq)} + I^-_{(aq)}$
   b) Write any two properties of the liquid state.

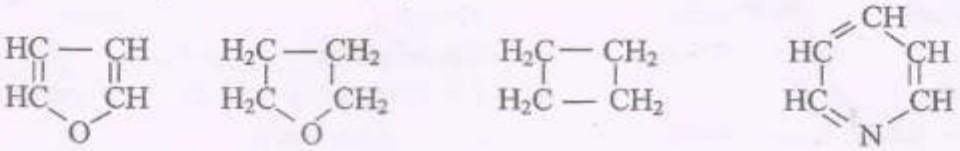
Section II

Q.4 **Select and write the most appropriate answer from the given alternatives for each sub – question:** **05**

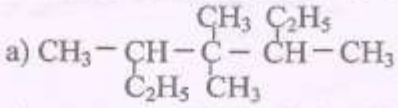
1. The species having the largest size is _____
   a) Rb b) Rb^+ c) Cs d) Cs^+
2. Any two adjacent members of a homologous series differ by a unit of _____
   a) 12 b) 14 c) 11 d) 10
3. The element which has the highest first ionization enthalpy is _____
   a) Be b) Mg c) Ca d) Ba
4. The number of primary, secondary and tertiary Carbon atoms respectively in iso – pentane are _____
   a) 1,1,3 b) 1,3,1 c) 2,1,0 d) 3,1,1
5. Organic compounds are non conductors of electricity because they
   a) are insoluble in water b) form free radicals
   c) do not form ions d) have low melting points

Q.5 **Answer *any FOUR* of the following:** **08**

1. Explain Amphoteric nature of water.
2. Classify and identify the following compounds as hetero – aromatic benzenoid, Homo – alicyclic, hetero – alicyclic, hetero aromatic non benzenoid.



3. State giving chemically balance equation, the action of dil. HCl and dil. H_2SO_4 on calcium carbonate.
4. Write any four points of similarity between Lithium and Magnesium.
5. Distinguish between Crystalline and Amorphous solids.
6. Write down the IUPAC names of the following compounds.



a) b) Neo - heptane

Q.6 **Answer *any FOUR* of the following:** **12**

1. Write the electronic configuration of, Strontium (38) and Caesium (55). Write any two uses of sodium.
2. Complete the following reactions with proper conditions if any
   i) $H_{2(g)} + N_{2(g)} \rightarrow$ ii) $ZnO + H_2 \rightarrow$
   Write any two physical properties of hydrogen.
3. **a)** What happens when sodium carbonate is heated above 373 K?
   b) Explain why aqueous solution of sodium carbonate is basic.
   c) Write any two uses of Na_2CO_3
4. An Organic compound on analysis contains carbon = 92.3% and Hydrogen 7.7%. Its vapour density is 39. Calculate molecular formula of a compound.
5. Write down the structural formula of
   a) an alkane with molecular formula C_5H_{12} having all hydrogen atoms identical.
   b) 4 – ethyl – 2, 2 – methyl hexane.
   c)
6. Write down the structure of the following functional groups :
   a) amino b) ether c) hydroxyl d) Ester e) Nitro f) bromo

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