

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.SC. FIRST SEMESTER EXAMINATION, DECEMBER 2011

FIRST YEAR

CHEMISTRY (General)

Date : 21/12/2011

Time : 11am – 12 noon

Paper : I

Full Marks : 25

## Unit – I

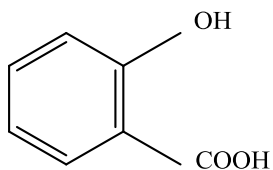
Answer **any three** questions from the following

1. a) Ionic bonds are non directional whereas covalent bonds are directional — explain. 2½  
b) Write down the informations obtained from radins ratio. 2½
2. Establish Born-Haber cycle for the formation of NaCl crystal from metallic Na and gaseous Cl<sub>2</sub>. Correlate the Lattice energy of NaCl with other necessary thermochemical data. 2+3
3. a) Draw the shapes of the following molecules using VSEPR theory:  
XeF<sub>4</sub>, H<sub>2</sub>O, NF<sub>3</sub> 3  
b) Why is the melting point of BeCl<sub>2</sub> less than MgCl<sub>2</sub>? 2
4. a) State and explain Fajan's rules to account for covalent and ionic character of molecules. 3  
b) Dipole moment of SO<sub>2</sub> is much greater than CO<sub>2</sub> — account for the phenomenon. 2
5. a) Define double and complex salts with one example of each. 1½x2  
b) Write the IUPAC name of the following: 2  
[Cr(H<sub>2</sub>O)<sub>5</sub>Cl]Cl<sub>2</sub> and Na<sub>2</sub>[Fe(CN)<sub>5</sub>NO]

## Unit–II

Answer **any two** questions from the following

6. a) How will you detect both nitro and amino groups in *p*-nitroaniline. Give chemical equations involved in the detection of the nitro group in the compound. 4  
b) What is Tollen's reagent? 1
7. a) Name the metal used in detection of nitrogen element in organic compound. What is the chemical compound formed by nitrogen element during reaction with this metal? 2  
b) Fill in the blank: 1  
Na<sub>2</sub>S + Na<sub>2</sub>[Fe(CN)<sub>5</sub>NO] → ?  
c) How will you distinguish C<sub>6</sub>H<sub>5</sub>COOH and phenol in the laboratory? 2
8. a) Diazotisation is always recommended to carry out at low temperature — why? 2  
b) Write the names of the characteristic functional groups in the following molecule. 3



Write down, with chemical equation, involved in the identification of any one functional group of the given compound.

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