# RAMAKRISHNA MISSION VIDYAMANDIRA

**(Residential Autonomous College under University of Calcutta)**

**B.A./B.SC. THIRD SEMESTER EXAMINATION, DECEMBER 2012**

**SECOND YEAR**

Date : 20/12/2012 **CHEMISTRY (General)**

Time : 11 am – 12 noon Paper : III Full Marks : 25

Answer **any one** question from each Unit

## UNIT-I

1. a) Derive an expression for the spectral transition energy of an electron from one Bohr orbit to another of the hydrogen atom in terms of wave number. 3
   b) Explain – "$PbCl_4$ is unstable but $PbCl_2$ is stable". 2
   c) Name one important ore of Berillium. How is it extracted from this ore? Give equations. 1+3
   d) Write a note on heavy water. 2
   e) "$Li^+$ has lower mobility than $Cs^+$ despite its smaller size". – Explain. 2

2. a) How can ortho-hydrogen and para-hydrogen by interconverted? What are the differences in the two forms? 2+2
   b) How is basic barillium acetate prepared? Show its structure. 2+1
   c) How is lithium carbonate prepared? What are its uses? 2+1
   d) Give a brief account of the complexes of alkali metals with Crown ethers. 3

## UNIT-II

3. a) Compare the Chemistry of hydrides of Group 16 elements. 3
   b) How Xenon tetrafluoride and Xenon trioxide can be prepared? Show their structures. 4
   c) Explain – "Dithionic acid is not considered as a polythionic acid". 2
   d) What happens when NaOH solution is added to $XeF_6$ in presence of $O_3$. Give equations. 3

4. a) Write a short note on $S_4N_4$. 3
   b) Show the preparation and structures of (i) Caros acid (ii) Marshall's acid. 2+2
   c) Give a brief account on interhalogen compounds. 3
   d) Explain – "The solubility of $I_2$ in water increases in presence of KI". 2