Uva Wellassa University, Sri Lanka
End Semester Examination – August 2011
SCT 131 -1 Inorganic Chemistry (Repeat)

Time: One (01) hour

Total **two (02)** questions
Answer **all** questions

Universal gas constant, $R = 8.314\ J\ K^{-1}\ mol^{-1}$
Plank's constant, $h = 6.626 \times 10^{-34}\ m^2\ kg\ s^{-1}$
Rydberg constant, $R_H = 1.096 \times 10^7\ m^{-1}$

01. i. Compare physical properties of Be, Mg, Ca and Sr.

(10 marks)

ii. Briefly explain **two** of following properties of s – block elements.

a. Alkali earth metals have higher melting points than the alkali metals.
b. Generally the group 1 elements form colourless compounds.
c. Chemical reactivity of the metals increase from Li to Cs

(10 marks)

iii. a. Give the name and the structure of the compound known as "Inorganic benzene"?
c. Explain, giving reasons, why the compound name above is called as "Inorganic benzene".

(10 marks)

iv. a. Draw the structures of graphite and diamond. Which form is more stable under ambient atmospheric conditions?
b. Briefly explain why graphite is soft but diamond is hard

(10 marks)

v.

Gas	F_2	Cl_2	Br_2
Bond energy/ kJ Mol^{-1}	159	243	193

a. Briefly explain why bond energy of F_2 is less than the bond energy of Cl_2.
b. Why bond energy of Br_2 is less than the bond energy of Cl_2?
c. Which one of the above gasses is difficult to prepare under normal conditions?

(10 marks)

02. i. State the Bohr model for a hydrogen atom.

(10 marks)

ii. State <u>two</u> drawbacks of the model.

(10 marks)

iii. Why do corresponding lines in the atomic spectra of hydrogen and deuterium appear at slightly different wavelengths?

(10 marks)

iv. What transition corresponds to the spectral line at 486 nm in the Balmer series?

(20 marks)