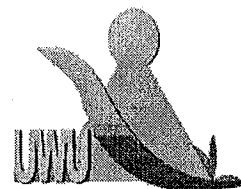


Uva Wellassa University, Sri Lanka
End Semester Examination – August 2011
SCT 131 -1 Inorganic Chemistry (Repeat)



Time: One (01) hour

Total two (02) questions
Answer all questions



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

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 F₂ is less than the bond energy of Cl₂.
b. Why bond energy of Br₂ is less than the bond energy of Cl₂?
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 two 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)