Eastern University, Sri Lanka

First Year First Semester Examination in Science

2008/2009 (April/May 2010)

CH 101 Periodicity and Bonding

(Proper & Repeat)

Answer **all** questions **Time: 01 hour**

Plank's constant (h)=6.63x10^{-34} Js, Velocity of light (C) = 3x10^{8} ms^{-1}, Mass of electron = 9.11 x 10^{-31} kg

1] The work function for lithium is 4.6 x 10^{-19} J.

(a) Calculate the lowest frequency of light that will cause photoelectric emission.

(40 marks)

(b) What is the maximum energy of the electrons emitted when light of 7.3 x 10^{14} Hz is used?

(30 marks)

(c) Why is the emission spectrum of hydrogen a line spectrum and not a Continuous spectrum? Explain

(30 marks)

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(a) Explain the following with suitable example in each case.

i) Resonance

ii) Photo electric effect

(40 marks)

(b) Write the four quantum numbers for each of eight electrons in oxygen atom in the ground state.

(10 marks)

(c) Draw the molecular orbital energy level diagram for H_2^+ and HCl molecules and determine the following properties of these two molecules.

i) Molecular orbital configurations

ii) Bond order

iii) Magnetic character

iv) Compare the bond length and bond strength (50 marks)