Nepal College of Information Technology

**Unit Test**

Fall 2013

Program : BE CE/ELX Time : 2 hrs

Semester : (I) FM : 70

Subject : Chemistry PM : 35

* *Candidates are requested to give their answer as far as practicable in their own words.*
* *The figure in the margin indicates the full marks*
* ***Attempt ALL question***

1 a. How does buffer solution resist the change in pH even on addition of small of acid or base? What will be the change in pH when 0.005 moles of HCl is added to a litre of solution containing 0.5 moles of each ammonia and ammonium chloride? pkb fo r ammonia is 4.74. [4+4]

b. Explain the electrochemical theory for corrosion with a suitable example. Construct a cell with positive standard cell potential from the following electrodes. Give the cell notation, electrode reactions, net cell reaction and also calculate cell potential. [4+3]

E°Al+++/Al = -1.66 volt and E°Ni++/Ni = 0.25 volt.

[Al+++] = 0.2M and [Ni++] = 0.1M

2 a. Define electron affinity. Explain the factors that govern the value of electron affinity. Why s-block elements are considered as strong reducing agent? [1+4+2]

b. Define standard electrode potential. How can you determine the standard electrode potential of copper electrode? [1+4]

c. Differentiate between galvanic cell and electrolytic cell. [3]

3 a. Define substitution reaction. Give the mechanism, kinetics and stereochemistry involved in the hydrolysis of tertiary Butyl bromide by aqueous NaOH solution. [7]

b. Differentiate between [4\*2=8]

i. Enantiomers and Diastereomers.

ii. E1 and E2 reactions

4 a. What are the basic monomer unit of the following polymers? [3]

Bakellite, Teflon, Polyureathane, Polyvinyl chloride, Nylon 66, Polythene

b. Differentiate between thermoplastic and thermosetting polymers. [5]

c. What is addition polymerization? Explain with examples. [4]

d. Give the important uses of sililcone. [3]

5. Write short note on: [any two] [5\*2=10]

a) Carbocations

b) Electrochemical series