THE OPEN UNIVERSITY OF SRI LANKA
B.Sc/ B.Ed DEGREE PROGRAMME- 2006/2007
Level 4- CHU 2123/ CHE 4123
INORGANIC CHEMISTRY

ASSIGNMENT II TEST

Date: 11th December 2006 Time: 3.30- 5.00 p.m.

Part A- Multiple Choice Questions (45 marks)

Answer all the questions

Select the most correct answer to each question given below and mark a cross ***X*** over the answer on the given answer sheet. Any answer with more than one ***X*** will not be counted. 3 marks will be awarded for each correct answer. 1/6 th of a mark will be deducted for each incorrect answer.

1.Which of the following is *not* a bidentate ligand?
(1) NH_2-NH_2 (2) $H_2NCH_2COO^-$ (3) $Ph_2PCH_2CH_2PPh_2$
(4) $NH_2(CH_2)_2NH(CH_2)_2NH_2$ (5) $C_2O_4^{2-}$

2.What is the coordination number of $[Ce(NO_3)_6]^{3-}$?
(1) 8 (2) 6 (3) 12 (4) 4 (5) 5

3. What is the geometry of $PtCl_2(PR_3)_2]^{3-}$?
(1) Square planar (2) Tetrahedral (3) Octahedral (4) Square pyramidal
(5) Trigonal bipyramidal

4. Which of the following represents the increasing order of the carboxylic acids in their ability to form stable complexes with Zn^{2+}?
(a) C_6H_5COOH (b) p-$NO_2C_6H_4COOH$ (c) m-ClC_6H_4COOH

(1) a < c < b (2) a < b < c (3) b < c < a (4) c < b < a (5) c < a < b

5. How many geometric isomers are possible for complexes with the general formula $MA_2B_2C_2$?
(1) 2 (2) 3 (3) 4 (4) 5 (5) 6

6. The reaction, $Na_2SO_3 + HClO \rightarrow Na_2SO_4 + HCl$, shows a
(1) Ligand transfer reaction (2) Electron transfer reaction (3) Atom transfer reaction
(4) Substitution reaction (5) Addition –Dissociation reaction

7. What is the decreasing order of the rate of exchange for the following alkali metal cations?
(1) $Rb^+>K^+>Cs^+$ (2) $Li^+>Na^+>K^+$ (3) $Rb^+>K^+>Na^+$
(4) $Na^+>Li^+>K^+$ (5) $K^+>Cs^+>Li^+$

8. The IUPAC name of the complex $[CrCl_2(CN)_2(O_2)(NH_3)]$ is
(1) Dichloroamminedicyanoperoxochromium (VI)
(2) Amminedichlorodicyanoperoxochromium (V)
(3) Dicyanodichloroammineperoxochromium (VI)
(4) Amminedichlorodicyanoperoxochromium (VI)
(5) Amminedichlorodicyanoperoxochromium (IV)

9. What is the type of isomerism found in the pair of compounds, $CoCl_2(NH_3)_4NO_2$ and $[CoCl_2(NO_2)(NH_3)_4]Cl$?
(1) Coordination position isomerism (2) Linkage isomerism (3) Geometric isomerism
(4) Polymerization isomerism (5) Ionization isomerism

10. Which of the following statement is *not* true about coordination compounds?
(1) Crystal Field Theory (CFT) provides an explanation for the observed colours of transition metal complexes.
(2) Coordination Isomerism can be considered as an extreme case of Ionization isomerism.
(3) Back donation increases the accumulation of charge on the metal in a given complex.
(4) Halides form more stable complexes when charge to size ratio is larger.
(5) Almost all tetrahedral complexes are weak field and high spin.

11. Which of the following statements is true about an α particle?
(1) It is identical to a helium atom
(2) It carries a charge of +2
(3) It is not deflected by electric and magnetic field
(4) It has a higher penetrating power than a β article
(5) It consists of 2 neutrons, 2 protons and 2 electrons.

12. Decay of potassium-40 produces calcium-40. The mode of decay of potassium-40 is by
(1) α emission (2) β emission (3) positron emission
(4) electron capture (5) γ emission

13. In the ^{238}U (4n+2) decay series, ^{234}Th, ^{234}Pa and ^{234}U are formed among other products.
The modes of decay, respectively, leading to these products will be
(1) β, α, α, ending with lead-208 (2) α, β, α, ending with lead-206
(3) α, β, β, ending with lead- 206 (4) α, α, β, ending with lead-208
(5) β, β, α, ending with lead-206

14. Which of the following represents a chain reaction?
(1) ${}_1^2H + {}_1^3H \rightarrow {}_2^4He + {}_0^1n$ (2) ${}_7^{14}N + {}_0^1n \rightarrow {}_6^{14}C + {}_1^1H$
(3) ${}_{15}^{31}P + {}_0^1n \rightarrow {}_{15}^{32}P + \gamma$ (4) ${}_{92}^{235}U + {}_0^1n \rightarrow {}_{54}^{139}Xe + {}_{38}^{95}Sr + 2({}_0^1n)$
(5) ${}_{92}^{235}U \rightarrow {}_{90}^{231}Th + {}_2^4He$

15. ^{237}Np undergoes decay, giving a series of products , finally ending with ^{209}Bi . To which decay series do these elements belong?
(1) (4n) (2) (4n+1) (3) (4n+2) (4) (4n+3)
(5) None of the above.