K15U 0118

Reg. No. : .....

Name : .....

III Semester B.Sc. Degree (CCSS – Supple./Imp.) Examination, November 2015
Complementary Course in Chemistry
3C03 CHE : CHEMISTRY FOR BIOLOGICAL SCIENCES
(2013 and Earlier Admissions)

Time : 3 Hours | Max. Weightage : 25

SECTION – A

Answer **all** questions. Choose the correct answer. **Each** question carries a Weightage of **1**.

1. i) Leaching of monazite is carried out by heating with
   a) NaOH b) KOH
   c) Con. H_2SO_4 d) Con. HCl

   ii) Very pure titanium is produced by
   a) Electrolytic method b) Van Arkel method
   c) Smelting d) Zone refining

   iii) The oxidation state and co-ordination number of Fe in $[Fe(CN)_6]^{3-}$ are
   a) +3 and 6 b) +2 and 6
   c) –3 and 6 d) –2 and 6

   iv) Which of the following is diamagnetic ?
   a) $[CO(NH_3)_6]^{3+}$ b) $[COF_6]^{3-}$
   c) $[Fe(CN)_6]^{3-}$ d) $[Fe(H_2O)_6]^{3+}$

2. i) An example of a chelating ligand is
   a) Ammonia b) Water
   c) Carbonyl d) EDTA

   ii) An example of a bidentate ligand is
   a) NH_3 b) H_2O
   c) ethylene diamine d) EDTA

iii) The IUPAC name of $CH_3CH_2COCH_3$ is

a) butan - 2- ol b) butan - 2 - al
c) butan - 3- one d) butan - 2 - one

iv) The general formula of alkynes is

a) C_nH_{2n+2} b) C_nH_{2n}
c) C_nH_n d) C_nH_{2n-2}

3. i) Among the following which is a nucleophile ?

a) H_2O b) $\overset{+}{C}H_3$
c) Cl^+ d) BF_3

ii) The number of σ and π bonds in the following molecule $CH_2 = CH - C \equiv N$ is

a) 6 and 3 b) 3 and 3
c) 3 and 6 d) 6 and 6

iii) Diethyl amine and methyl propyl amine are

a) metamers b) chain isomers
c) tautomers d) functional isomers

iv) Which among the following has a plane of symmetry ?

a) lactic acid b) methane
c) meso tartaric acid d) tartaric acid

4. i) Which among the conformations of butane is more stable ?

a) Anti b) Gauche
c) Totally eclipsed d) Skew eclipsed

ii) Among the following which is a chromophore ?

a) $-OH$ b) $-NR_2$
c) $-C \equiv N$ d) $-NH_2$

iii) In NMR spectroscopy, the radiation used is

a) Radiowave b) IR
c) uv – Vis d) Microwave

iv) The high energy electronic transition is

a) $\sigma \rightarrow \sigma^A$ b) $\pi \rightarrow \pi^A$
c) $n \rightarrow \pi^A$ d) $n \rightarrow \sigma^A$ **(4× 1=4)**

SECTION – B

Answer **any five** questions. **Each** carries a weightage of **1**.

5. What is calcination ? Give an example.
6. Give the IUPAC name of
   i) $[Ag(NH_3)_2]Cl$ ii) $[Pt\,Cl_4(NH_3)_2]$
7. Explain two applications of coordination compounds in qualitative analysis.
8. What are alicyclic compounds ? Give an example.
9. Explain the hybridisation of ethene.
10. What is the hybridisation state of carbon in carbocation, carbanion and methyl free radical.
11. Define the terms enantiomers and diastereomers.
12. What are geometrical iromers ? Give examples. **(5× 1=5)**

SECTION – C

Answer **any four** questions. **Each** carries a weightage of **2**.

13. Explain the Mond's process for the extraction of nickel.
14. With suitable examples explain Huckel's rule.
15. Explain Walden inversion taking 2 – bromobutane as an example.
16. Draw the conformational isomers of tartaric acid.
17. Comment on the stability of chain and boat forms of cyclohexane.
18. Distinguish hyper chromic and hypochromic effect with suitable examples. **(4× 2=8)**

SECTION – D

Answer **any two** questions. **Each** carries a weightage of **4**.

19. Discuss the postulates of Werner's co-ordination theory.
20. Describe the mechanism of aromatic electrophilic substitution of toluene and nitrobenzene.
21. Explain the principle and applications of NMR spectroscopy. **(2× 4=8)**

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