5/10/2017

S.Y.B.Sc. CHEMISTRY P-II SEM-IV (A.T.K.T) EXAM OCT-2017 75MARKS 2.5Hrs

NOTE: i) All the questions are compulsory.

ii) Figures to right indicate full marks.

iii) Use of right programmable calculator/log table is allowed.

Q.1] Attempt any four: [20]

a) Define the terms: i) complex ion ii) Ligand iii) Co-ordination number iv) Co-ordination compound v) Co-ordination sphere

b) What are ligands? Explain the classification with suitable example.

c) Name the following complex compounds:

i) $[Co(NH_3)_6]Cl_3$ ii) $[Ag(NH_3)_2]Cl$ $[CoCl(NH_3)_5]^{2+}$

iv) $[Co(NO_2)_3(NH_3)_3]$ v) $K_4[Fe(CN)_6]$

d) What is heme complex? Draw the structure of heme.

e) How does haemoglobin transports CO_2 from tissues to lungs.

f) What are fundamental postulates of Werner's theory? On the basis of this theory explain the structure of $CoCl_3.6NH_3$ and $CoCl_3.5NH_3$.

g) Explain the following:

i) $[Ni(CN)_4]^{2-}$ is diamagnetic while $[NiCl_4]^2$ is paramagnetic

ii) $[Fe(CO)_5]$ has trigonal bipyramidal structure.

h) Explain the linkage isomerism and hydrate isomerism with suitable examples.

Q.2] Attempt any four questions: [20]

a) Write a note on different types of metals carbon bonding in carbonyl compounds.

b) Explain preparation of monocarboxylic acid by oxidation of side chain of alkyl benzene.

c) Write down general properties of carbonyl.

d) Explain friedel-Craft acylation of arenes

e) Write the application of organomettalic compounds.

f) Write a note on preparation of dicarboxylic acid by oxidation of side Chain of alkyl benzene.

g) Explain Gatterermann Koch formylation with suitable example.

h) Explain any two methods of preparation of aldehydes.

Q.3] Attempt any four: [20]

a) Draw the conformation of n-butane for rotation about C_1-C_2 bond and discuss their relative stabilities.

b) How will you prepare the following using diazotization.

i) Methyl orange ii) Orange- II

c) How will you prepare primary amines from:

i) Cyclohexanone to cyclohexylamine ii) Aryl nitriles

d) Explain the following:

i) Aniline is weaker base than aliphatic primary amines.

ii) P-nitroaniline is a weaker base than aniline.

e) What is conformational analysis? Give the conformation of ethane.

f) Write a note on:

i) Sandmeyer-Gattermann reaction ii) Azo coupling reaction

g) What is tautomerism? What are its characteristics?

h) Explain the following reactions with mechanism:

i) Claisen-Schmidt reaction ii) Cannizzaro reaction

Q.4] Attempt any three: [15]

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a) Write the formulae of the following:

i) Tetrammine dibromo platinum (IV) bromide.

ii) Bis (dimethylglyoximato) nickel (II).

iii) Tetracarbonyl Nickel (O).

iv) Sodium trioxalato ferrate (III).

v) Bis (ethylene diamine) dichloro cobalt (III) ion.

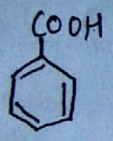
b) What is EAN rule? Find the EAN for the

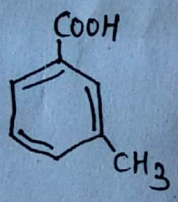
i) $K_4[Fe(CN)_6]$ ii) $[Ag(NH_3)_2]Cl$ iii) $[Co(NH_3)_6]^{3+}$

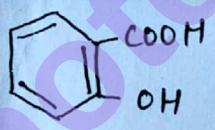
iv) $Pt(NH_3)_6^{4+}$

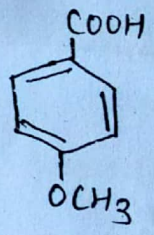
c) Explain any two general methods of preparation of carbonyl compounds with suitable example.

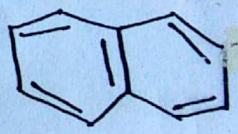
d) Give the IUPAC name of the following compounds:

i) 

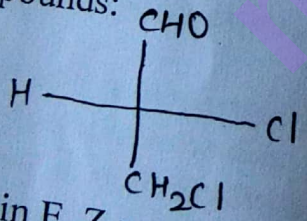
ii) 

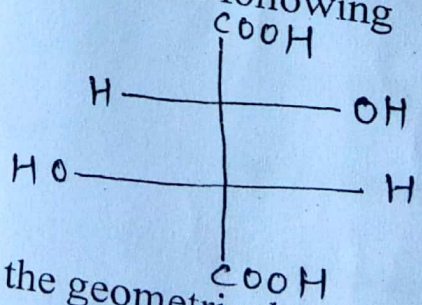
iii) 

iv) 

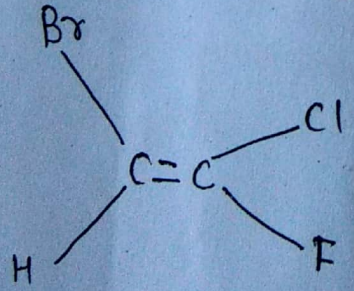
v) 

e) Assign R, S descriptors to the chiral centers in the following compounds:

i) 

ii) 

f) Explain E, Z nomenclature for naming the geometrical isomers.

i) 

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