PG – 199

II Semester M.Sc. Examination, June 2016
(CBCS)
CHEMISTRY
C – 202 : Organic Chemistry – II

Time : 3 Hours Max. Marks : 70

Instruction : *Answer question no.* ***1*** *and* ***any five*** *of the remaining questions.*

1. Answer **any ten** of the following. **(10×2=20)**

a) Write the structures of the products and give the mechanism

$$Ar\overset{+}{N}\equiv N + [Cu\,(I)Br_2]^- \rightarrow A + B\cdot$$

b) Give a method, with equation, for the introduction of fluorine into an aromatic ring.

c) What is the product formed in Friedal-Crafts acylation of benzene employing RCN and HCl in presence of a Lewis acid ? Give equation.

d) Give any two methods for the formation of xanthates.

e) What are β-hydroxy esters ? Give the structure of a representative β-hydroxy ester and a method for its preparation.

f) How to convert aldehydes to nitriles ? Give the mechanism.

g) Give the mechanism of metal hydride reduction (NaH) of saturated carbonyl compounds.

h) What is Tiffeneav-Demjanov reaction ? Give the equation.

i) Give any four distinguishing features of elimination reactions.

j) Give the steps involved in the conversion of malonic ester to Alanine.

k) Write the structures of Fmol-Asp-(Bzl) – CO_2H and Z-Ser (t-Butyl) – CO_2H.

l) Explain briefly the utility of cNBr in fragmentation of polypeptides.

2. a) Illustrate the Arenium ion mechanism of electrophilic aromatic substitution reactions and write the energy profile diagrams.

   b) Complete the following equations. Give mechanism

   i) $ArH + Zn(CN)_2 \xrightarrow[(ii)\ H_2O]{(i)\ HCl} A$

   ii) $ArCHO \xrightarrow{H_2SO_4} B + C$ **(4+6=10)**

3. a) What are Mannich bases ? Give their synthesis and use in organic synthesis.

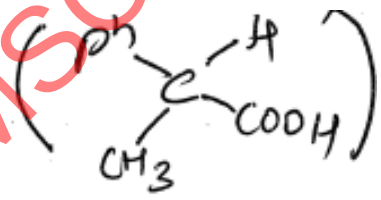
   b) Write a note on the following :

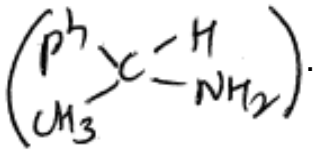
   i) Gatterman-Koch reactions

   ii) E_{1CB} mechanism. **(4+6=10)**

4. Give the equations for the following reactions. Propose a possible mechanism.

   i) Reaction of hydrazobenzene with acid.

   ii) Conversion of PhCHMe CO_2H  to PhCHMe NH_2

   iii) Reaction of ketoximetosylate with ethoxide ion. **(3+3+4=10)**

5. a) Give the steps involved in solid phase synthesis of oxytocin.

   b) Describe the use of DCC-HOBt in peptide synthesis. **(5+5=10)**

6. Write a note on the following :

   i) Vilsmeier-Haack reaction

   ii) Bucherer reaction

   iii) Sommelet-Hauser rearrangement. **(3+3+4=10)**

7. a) Illustrate the use of LAH and $NaBH_4$ in the reduction of unsaturated carbonyl compounds and ester.

   b) Write a note on the following :

      i) Favorskii rearrangement

      ii) Firtch-Buttenberg-Wiechell rearrangement. **(5+5=10)**

8. a) Illustrate the use of Edman method in sequencing of peptides.

   b) Write a note on :

      i) Pyrolytic elimination reactions

      ii) Chugaev reaction. **(4+6=10)**