BF—17—2016

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

OCTOBER/NOVEMBER, 2016

CHEMISTRY

Paper XIV

(Organic and Inorganic Chemistry)

(Friday, 7-10-2016) **Time : 10.00 a.m. to 12.00 noon**

Time—2 Hours *Maximum Marks—40*

N.B. :—(*i*) Attempt *All* questions.
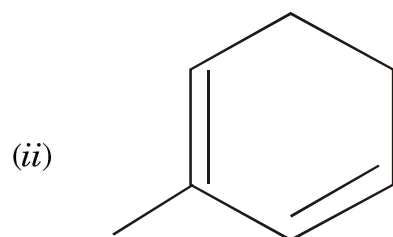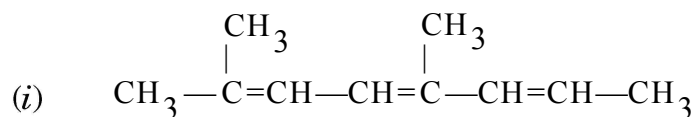
(*ii*) Figures to the right indicate full marks.

Section A

(Organic Chemistry)

1. Answer any *five* of the following : 5×2=10

(*a*) Explain $\pi \rightarrow \pi^*$ transition.

(*b*) Calculate the λ_{max}

(*i*) $CH_3-\overset{\overset{\displaystyle CH_3}{|}}{C}=CH-CH=\overset{\overset{\displaystyle CH_3}{|}}{C}-CH=CH-CH_3$

(*ii*)

(*c*) Explain Equivalent and Non-equivalent proton.

P.T.O.

(*d*)   Predict the number of PMR signals of :

   (*i*)   Ethanol

   (*ii*)   Ethyl-Benzene.

(*e*)   What are peptides ? How are they classified ?

(*f*)   Give the following colour tests of protein :

   (*i*)   Biuret test

   (*ii*)   Xanthoprotic test.

(*g*)   Give the preparation of Glycine by Streckers synthesis. What is the action of nitrous acid on glycine ?

2.   Answer any *two* of the following :   2×5=10

(*a*)   How will you distinguish Ethane, Ethene, Ethyne by using I.R. spectroscopy ?

(*b*)   Explain Fries rearrangement with mechanism.

(*c*)   How will you synthesize α-amino acid by Streckers synthesis ? What is the action of heat on glycine ?

3.   Answer any *one* of the following :   1×7=7

(*a*)   Explain condensation polymerization with suitable example. Give the synthesis of :

   (*i*)   Polymethyl methacrylate

   (*ii*)   Glyptol.

(*b*)   An organic compound with molecular formula $C_2H_6O_2$ gave the following spectral data :

   U.V. : Transparent above λ_{max} 210 nm.

   I.R. : 3400 cm^{-1} (Broad), 2970 cm^{-1}.

   PMR :

   (δ ppm) : δ 2.5 (S, exchangeable with D_2O, 2H)

             δ 3.68 (t, 4H)

   Deduce the structure of the compound.

Section B

(Inorganic Chemistry)

4. Solve any *three* of the following : 3×3=9

   (*a*) Give the limitation of valence bond theory of co-ordination compound.

   (*b*) Calculate CFSE value of d^4, d^6 and d^8 system in high spin octahedral complexes.

   (*c*) Explain the effect of nature of ligands on the magnitude of Δ_0.

   (*d*) Discuss in detail the electronic spectrum of $[Ti(H_2O)_6]^{+3}$ complex ion.

   (*e*) What is meant by electronic transitions ? Give its type.

5. solve any *two* of the following : 2×2=4

   (*a*) Draw energy level diagram showing splitting of five d-orbitals in tetrahedral and octahedral field.

   (*b*) Explain inner orbital complexes with suitable example.

   (*c*) Calculate the number of unpaired electrons in octahedral weak field for Co^{+3} and Fe^{+3}.

   (*d*) Draw Orgel diagram for d^1 and d^9 system.