TKN/KS/16/5918

Bachelor of Science (B.Sc.) Semester–VI (C.B.S.) Examination

CH-602 : ORGANIC CHEMISTRY

Paper—2

Time—Three Hours] [Maximum Marks—50

N.B. :— (1) All **FIVE** questions are compulsory and carry equal marks.

(2) Write chemical equations and draw diagrams wherever necessary.

1. (A) What is the principle of Nuclear Magnetic Resonance Spectroscopy ? How many NMR signals would you expect for :
   (i) Ethyl acetate
   (ii) Ethanal and
   (iii) 1, 2-Dibromo-ethane ? 5

   (B) A compound with a molecular formula C_8H_8O has the following NMR data :
   (i) Singlet δ–2.25 (3H)
   (ii) Complex multiplet δ–7.45 (3H)
   (iii) Complex multiplet δ–7.90 (2H)
   Give reasons and assign the structure of the compound. 5

OR

5. Attempt any **TEN** of the following :
   (i) What is Coupling Constant ? 1
   (ii) How many NMR signals would you expect from acetyl acetone ? 1
   (iii) Define Peak Area. 1
   (iv) What are reactive methylene compounds ? 1
   (v) What are epimers ? 1
   (vi) Draw the structure of 2-Deoxyribose. 1
   (vii) What are peptides ? 1
   (viii) Why are amino acids called amphoteric Compounds ? 1
   (ix) Name the types of bases present in nucleotides. 1
   (x) Write the structure of chloramine-T. 1
   (xi) What are the two main types of polyamides ? 1
   (xii) Write the structure of Dettol. 1

(C) Explain spin-spin coupling with suitable example. 2½

(D) What is shielding and deshielding of protons in NMR spectroscopy ? 2½

(E) An organic compound with molecular formula C_7H_8 gave the following data :

(i) Singlet δ 2.32, 3H and

(ii) Singlet δ 7.17 5H

Explain and assign a structural formula to the compound. 2½

(F) What is Chemical Shift ? On what scales the chemical shift can be measured ? 2½

2. (A) What is Claisen Condensation ? Discuss its mechanism. 5

(B) Why is open chain structure of glucose discarded ? How is pyranose type six membered cyclic structure of glucose established ? 5

OR

(C) Starting from malonic ester, how will you prepare :—

(i) Succinic acid and

(ii) Barbituric acid ? 2½

(D) How is fructose converted to glucose ? 2½

(E) Write a note on keto-Enoltautomerism in Acetoacetic ester. 2½

(F) What happens when glucose is treated with excess of phenyl hydrazine ? 2½

3. (A) What are Amino Acids ? How are they classified ? Give one example of each class. 5

(B) Discuss the double helical structure of DNA. 5

OR

(C) Explain the terms :

(i) Saponification value, and

(ii) Iodine value of Fats and oils. 2½

(D) Write a note on electrophoresis. 2½

(E) What are detergents ? How do they differ from traditional soaps ? 2½

(F) Discuss—'Denaturation of Proteins'. 2½

4. (A) Explain electronic concept of Colour and Chemical Constitution of dyes. 5

(B) What are Polymers ? Give an example. Discuss free radical mechanism of chain growth polymerisation. 5

OR

(C) Give the preparation, properties and uses of Aspirin. 2½

(D) Explain Ziegler-Natta polymerisation. 2½

(E) Give synthesis and uses of Cango-red. 2½

(F) Define with example :

(i) Chromophore and

(ii) Auxochrome. 2½