NRT/KS/19/2172

Bachelor of Science B.Sc. Semester–VI Examination

CH-602 : ORGANIC CHEMISTRY

Compulsory Paper—2

(Chemistry)

Time : Three Hours]   [Maximum Marks : 50

Note :— (1) **All** five questions are compulsory and carry equal marks.

(2) Write chemical equations and diagrams wherever necessary.

1. (A) Discuss the principle of NMR spectroscopy. How many NMR signals would you expect for :

    (i) Ethyl alcohol

    (ii) 1, 2–Dibromo ethane and

    (iii) Ethyl acetate.   5

    (B) Explain the significance of peak area in NMR spectroscopy with example. 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.

    Give reasons and assign the structure of the compound.   5

OR

    (C) Explain the role of TMS in NMR spectroscopy.   2½

    (D) Explain the term 'coupling constant' with its unit.   2½

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

    (F) With reference to NMR spectroscopy explain equivalent and non-equivalent protons.   2½

2. (A) What is claisen condensation ? Discuss with its mechanism.   5

    (B) Discuss the open chain structure of glucose. Give its limitations.   5

OR

    (C) Explain Keto-Enol tautomerism in acetoacetic ester.   2½

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

    (i) Succinic acid and

    (ii) Barbituric acid.   2½

    (E) What happens when glucose is treated with excess of Phenyl hydrazine ? 2½

    (F) What is Killiani's synthesis ? Explain with example.   2½

3. (A) Draw and explain double helical structure of DNA. 5

   (B) Write note on "Hydrogenation of Unsaturated oils."

   Define :

   (i)   Saponification value

   (ii) Iodine Value and

   (iii) Acid Value. 5

OR

   (C) Explain acid-base behaviour of amino acids. 2½

   (D) How the proteins are classified on the basis of structure ? 2½

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

   (F) Distinguish between Fats and Oils. 2½

4. (A) Give an account of electronic theory of colour and chemical constitution of dyes. 5

   (B) What are polymers ? Discuss free radical mechanism of chain growth polymerisation with example.
   5

OR

   (C) What are the qualities of ideal drugs ? 2½

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

   (E) Give synthesis and uses of Alizarin dye. 2½

   (F) Explain Ziegler-Natta polymerisation. 2½

5. Attempt any **ten** of the following :

   (i)   How many NMR signals would you expect in Acetaldehyde. 1

   (ii)   Define term chemical shift. 1

   (iii) Give any two applications of NMR spectroscopy. 1

   (iv)   What is reactive methylene group ? 1

   (v)   What are epimers ? 1

   (vi)   Draw the structure of sucrose. 1

   (vii) What is electrophoresis ? 1

   (viii) Give the reaction for the preparation of soap. 1

   (ix)   What are conjugated proteins ? 1

   (x)   Give the uses of phenolphthalein dye. 1

   (xi)   Draw the structure of Dettol. 1

   (xii) What are polyamides ? Give example. 1