NKT/KS/17/5205

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

CHEMISTRY

(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) Draw diagrams and give chemical reactions wherever necessary.

1. (A) A compound with molecular formula C_7H_8 has the following NMR data. 5

(i) Singlet, δ = 2.34, 3H and (ii) Singlet, δ = 7.17, 5H

Give reasons and assign the structure of the compound.

(B) With reference to NMR spectroscopy, explain : 5

(i) Equivalent and non-equivalent protons (ii) Peak area.

OR

(C) Discuss the principle of Nuclear Magnetic Resonce spectroscopy. 2½

(D) Explain 'coupling constant' with suitable example. 2½

(E) Why is TMS used as a reference compound in NMR spectroscopy ? 2½

(F) Explain (n+1) rule in spin-spin coupling in NMR spectroscopy. 2½

2. (A) How is acetoacetic ester prepared by claisen condensation ? How will you convert ethyl acetoacetate into : 5

(i) Acetic acid (ii) Succinic acid

(iii) Crotonic acid and (iv) 4-methyl uracil.

(B) Discuss Haworth methylation method for determination of ring size of glucose. 5

OR

(C) Explain the acidity of α-hydrogen in reactive methylene compound. 2½

(D) Write a note on mutarotation. 2½

(E) Discuss keto-enol tautomerism with reference to acetoacetic ester. 2½

(F) How will you convert glucose to fructose ? 2½

3. (A) What are amino acids ? How are they classified ? Discuss stereochemistry of α-amino acids. 5

(B) What are fats and oils ? How do they differ from one another ? Give an account of edible and industrial oil of vegetable origin. 5

OR

(C) What are proteins ? How are they classified on the basis of their structure ? 2½

(D) Explain hydrogenation of oil. 2½

(E) Write note on denaturation of proteins. 2½

(F) What are detergents ? In what way they are superior to soaps ? 2½

4. (A) Discuss Otto Witt's theory of colour and constitution. 5

(B) What is chain growth polymerization ? Discuss mechanism of free radical vinyl polymerization. 5

OR

(C) Give synthesis and uses of congored. 2½

(D) Give preparation and used of Aspirin. 2½

(E) What are polyamides ? Give preparation and uses of Nylon-66. 2½

(F) Give preparation and uses of Dettol. 2½

5. Attempt any **TEN** questions of the following : 1×10=10

(i) What is chemical shift ?

(ii) Assign structural formula for C_2H_6O which gives only one NMR signal.

(iii) How many signals would you expect in NMR spectrum of 2-propanol.

(iv) What is reactive methylene group ?

(v) What is the action of hydroxylamine on glucose ?

(vi) Draw structure of maltose.

(vii) What are peptides ?

(viii) What are ribonucleosides ?

(ix) Define the term ‘iodine value’.

(x) What are dyes ?

(xi) Give structure and uses of chloramine-T.

(xii) Give the chemical reaction for the preparation of Nylon-6.