

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

CH-602 : ORGANIC CHEMISTRY

Compulsory Paper—2

(Chemistry)

Time : Three Hours]

[Maximum Marks : 50

N.B. :— (1) ALL five questions are compulsory.

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

1. (A) Discuss principle of NMR spectroscopy. How many signals are expected in Ethyl alcohol and Acetaldehyde ? 5
- (B) A compound with a molecular formula C_7H_8 has the following 1H NMR data :
- (i) Singlet, $\delta 2.4$, 3H,
- (ii) Singlet, $\delta 7.2$, 5H
- Give reasons and assign the structure of molecule. 5

OR

- (C) Explain equivalent and non-equivalent protons with suitable examples. 2½
- (D) Explain the role of TMS in NMR spectroscopy. 2½
- (E) How many NMR signals are observed in n-propyl alcohol and isopropyl alcohol ? 2½
- (F) What is shielding and deshielding of protons in NMR spectroscopy ? 2½
2. (A) Discuss reactive Methylene group in Malonic ester. Starting from malonic ester, how will you synthesize
- (i) Succinic acid
- (ii) Barbituric acid ? 5
- (B) Discuss open chain structure of glucose and give its limitations. 5

OR

- (C) Explain acidic nature of α -hydrogen atom in ethylacetoacetate. 2½
- (D) How will you convert acetoacetic ester into :
- (i) Acetic acid and
- (ii) Acetone. 2½
- (E) Explain the term “Epimerisation” with example. 2½
- (F) How is aldopentose converted into aldohexose ? 2½
3. (A) What are amino acids ? How are they classified ? Discuss acid-base behaviour of Amino acids. 5
- (B) What are oils and fats ? How are they differ from each other ? Discuss hydrogenation of oils. 5

OR

- (C) Explain :
- (i) Nucleosides and
 - (ii) Nucleotides. 2½
- (D) Write a note on “Synthetic detergents”. 2½
- (E) Explain the following terms :
- (i) Soaps and
 - (ii) Iodine value. 2½
- (F) Discuss the following terms :
- (i) Electrophoresis
 - (ii) Peptides. 2½
4. (A) Discuss modern theory of colour and constitution. 5
- (B) Give the preparation and uses of :
- (i) Terylene and
 - (ii) Nylon 66. 5

OR

- (C) Give synthesis and uses of crystal violet. 2½
- (D) Give one method of preparation of paracetamol and its uses. 2½
- (E) Explain synthesis and application of chloramine-T. 2½
- (F) Explain Ziegler-Natta polymerisation. 2½
5. Attempt any **ten** of the following :
- (i) Define coupling constant ‘J’.
 - (ii) How many NMR signals obtained in Ethyl bromide ?
 - (iii) What is chemical shift ?
 - (iv) Draw Keto and Enol form of Ethyl acetoacetate.
 - (v) What is Mutarotation ?
 - (vi) How does glucose react with $\text{Br}_2/\text{H}_2\text{O}$?
 - (vii) What are proteins ?
 - (viii) Define isoelectric point.
 - (ix) Define ‘Acid value’.
 - (x) What is meant by chromophores ?
 - (xi) Draw the structure of Dettol.
 - (xii) Give any two uses of Nylon 6. 10×1=10