Bachelor of Science (B.Sc.) Semester—VI (C.B.S.) Examination
CH–602 : ORGANIC CHEMISTRY
Paper—2
(Chemistry)

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) All FIVE questions are compulsory and carry equal marks.
(2) Write chemical equations and diagrams wherever necessary.

1. (A) With reference to NMR spectroscopy explain :
   (i) Equivalent and non-equivalent protons
   (ii) Chemical shift. 5

   (B) What is the significance of peak area in NMR spectroscopy ? A compound having molecular
   formula C\textsubscript{2}H\textsubscript{4}Br\textsubscript{2} gave following signals :
   (i) Doublet, δ2.5 (3H)
   (ii) Quartet, δ5.85 (1H)

   Assign the structure of compound giving reasons. 5

   OR

   (C) Explain shielding and deshielding of protons in NMR Spectroscopy. 2½
   (D) Explain the role of TMS in NMR spectroscopy. 2½
   (E) How many NMR signals do you expect in the following compounds :
      (a) Acetophenone
      (b) Ethyl acetate ? 2½
   (F) Define the term “Coupling constant”. Write its unit and factors affecting coupling constant. 2½

2. (A) What are reactive methylene compounds ? Starting from malonic ester how will you synthesize
   the following :
   (i) Acetic acid,
   (ii) Cinnamic acid
   (iii) Barbituric acid ? 5

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

   OR

   (C) What is the action of excess of phenyl hydrazine on glucose ? 2½
   (D) Starting from acetoacetic ester, how will you prepare :
      (i) 4-methyl uracil
      (ii) Acetone ? 2½
   (E) Write a note on Keto Enol tautomerism in acetoacetic ester. 2½
   (F) What is Killiani’s synthesis ? Explain. 2½
3. (A) What are amino acids? Explain following of amino acid
   (i) Acid Base behaviour
   (ii) Electrophoresis.  
   (B) What are detergents? In what way are they superior to soaps? Discuss the method of preparation of sulphonate.  

   OR

   (C) Write a note on denaturation of proteins.  
   (D) Distinguish between fats and oils.  
   (E) Discuss the process of hydrogenation of oil.  
   (F) How the proteins are classified on the basis of structure?  

4. (A) What is addition polymerisation? Explain free radical mechanism of vinyl polymerisation.  
   (B) What are qualities of Ideal drug? Explain preparation, properties and uses of Chloramin T.  

   OR

   (C) Define with example Chromophore and Auxochromes.  
   (D) Give synthesis and uses of Phenolphthalein.  
   (E) Give synthesis of Nylon-66.  
   (F) Give preparation and uses of Dettol.  

5. Attempt any TEN of the following:
   (i) How many NMR signals would you expect from acetaldehyde?  
   (ii) What are the units of expressing chemical shifts?  
   (iii) How many NMR signals will appear for Acetone?  
   (iv) What is acidity of $\alpha$-hydrogen?  
   (v) Write the reaction of Claisen condensation.  
   (vi) What are carbohydrates?  
   (vii) What is isoelectric point?  
   (viii) What are conjugated proteins?  
   (ix) Give the reaction for the preparation of soap.  
   (x) Give the uses of Alizarin dye.  
   (xi) Draw the structure of Paracetamol.  
   (xii) Give any two uses of Terylene.