Exam. Code : 103204
Subject Code : 1348

B.A./B.Sc. Semester—IV

CHEMISTRY

(Organic Chemistry—III)

Time Allowed—3 Hours] [Maximum Marks—35

Note :— This question paper has ***two*** parts. Part-A is compulsory. Part-B has ***three*** sections. ***Two*** questions are to be attempted from each of these sections (total ***six*** questions from Part-B).

PART—A

1. Give a general method of synthesis of esters.
2. Give mechanism of decarboxylation of carboxylic acids with a suitable example.
3. How do Grignard and organolithium reagents react with epoxides ? Give one example each.
4. What is Gabriel Phthalimide synthesis ? What are its limitations ?
5. Why are organometallic reagents prepared and used under inert atmospheric conditions ?
6. Write a general mechanism of electrophilic substitution of pyrrole.
7. What is the synthetic utility of Hoffmann bromamide reaction ?
8. How are sulphonamides prepared and hydrolysed ?

1×8=8

PART—B

SECTION—I

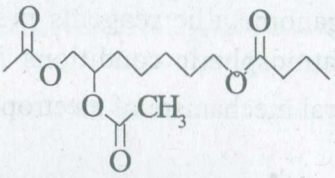
9. What type of tetrahedral intermediate is formed in the esterification reaction of ethanoic acid with ethanol ? 4½

10. Identify the more acidic compound in each of the following pairs :

    (a) Cyclohexanecarboxylic acid and benzoic acid

    (b) Furan-2-carboxylic acid and Furan-3-carboxylic acid. 4½

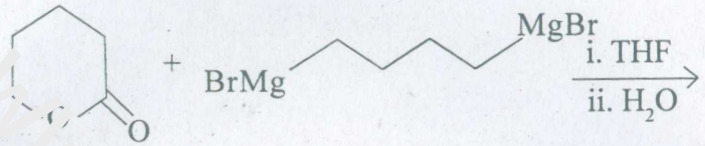
11. The compound having the structure shown below was heated with dilute sulphuric acid to give a product having the molecular formula $C_7H_{16}O_3$ in 70% yield. Propose a reasonable structure for the product. What other organic compounds are formed in this reaction ? 4½



SECTION—II

12. Give a rational mechanism of hydrolysis of acetanilide in acidic solutions. 4½

13. Outline reasonable mechanism for the following reaction : 4½



14. (a) Why quaternary ammonium salts are used as catalysts in phase transfer catalysis ?

(b) Explain the mechanism of synthesis of primary amine such that it has one carbon atom less than the parent compound. 4½

SECTION—III

15. How are organolithium reagents prepared ? Why organometallic reagents cannot be prepared or used in the presence of any material that bears OH, NH or SH ? 4½

16. Draw molecular orbital structure of pyridine. Why pyridine is a much stronger base than pyrrole ? 4½

17. Suggest two ways in which 2-pentanol might be prepared by using a Grignard reagent. Write chemical equations to support your answer. 4½