

NRT/KS/19/2049

Bachelor of Science (B.Sc.) Semester—II Examination

CHEMISTRY (Organic Chemistry) (CH201)

Compulsory Paper—1

Time : Three Hours]

[Maximum Marks : 50

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

(2) Write chemical equation and draw diagram wherever necessary.

1. (A) What is hybridisation ? Explain the structure of Ethylene molecule on the basis of hybridisation. 5
- (B) Discuss Homolytic and Heterolytic fission of covalent bond with suitable exmple. 5

OR

- (C) Write a note on Inductive effect. 2½
- (D) Discuss hydrogen bonding with reference to alcohol. 2½
- (E) Define the terms with suitable example :
- (i) Substitution reaction and
- (ii) Elimination reaction. 2½
- (F) Classify the following as electrophiles and nucleophiles :
- (i) FeCl_3 (ii) H_2O (iii) CH_3NH_2 (iv) BF_3 and (v) AlCl_3 . 2½
2. (A) What is Optical activity ? Discuss optical isomerism in Tartaric acid and Lactic acid. 5
- (B) Define conformation. Discuss conformational isomerism of n-butane. 5

OR

- (C) Explain geometrical isomerism in Maleic and Fumaric acid. 2½
- (D) Write a note on Newman's projection and Sawhorse formulae of Ethane. 2½
- (E) Discuss D and L nomenclature with suitable example. 2½
- (F) What is Resolution ? Explain biological method of resolution 2½
3. (A) What is Peroxide effect ? Explain free radical mechanism of addition of HBr to propene. 5
- (B) Discuss Baeyer's strain theory. Give its limitations. 5

OR

- (C) Discuss the mechanism of chlorination of methane molecule. 2½
- (D) Write a note on L.P.G. 2½
- (E) How will you prepare ethylene from :
- (i) Ethyl alcohol and
- (ii) Ethyl bromide ? 2½
- (F) Discuss Ionic mechanism of addition Br_2 to ethylene. 2½

4. (A) What are dienes ? How they are classified ?
What is the action of :
- (i) Bromine and
 - (ii) HBr on 1, 3-butadiene ? 5
- (B) What is aromatic electrophilic substitution reaction ? Discuss mechanism of nitration of benzene with energy profile diagram. 5

OR

- (C) Explain acidic nature of ethyne. 2½
 - (D) Discuss the Diels—Alder reaction. 2½
 - (E) Discuss molecular orbital structure of Benzene. 2½
 - (F) What is Huckel rule ? Explain aromaticity of cyclopentadienyl anion. 2½
5. Solve any **TEN** of the following :—
- (i) Define Carbonium ion.
 - (ii) Draw M.O. Structure of Ethane molecule.
 - (iii) Give one example of addition reaction.
 - (iv) What is Asymmetric synthesis ?
 - (v) What is meant by stereogenic centre ?
 - (vi) What is racemisation ?
 - (vii) Draw structure and give IUPAC name of neopentane.
 - (viii) What is the action of O₃ on Ethylene ?
 - (ix) Define Octane number.
 - (x) What is oxyacetylene flame ?
 - (xi) Give the polymerisation reaction of acetylene.
 - (xii) State Huckel's rule of aromaticity. 1×10=10