

Exam. Code : 103201

Subject Code : 1297

B.A./B.Sc. Ist Semester

CHEMISTRY

(Organic Chemistry—I)

Time Allowed—3 Hours]

[Maximum Marks—35

PART—A (Compulsory)

**Note** :— Attempt ALL the questions, each question carries 1 mark.

1. Why ethylamine is more basic than aniline ? Explain.
2. Differentiate between homolytic and heterolytic bond cleavages.
3. What is Lindlar's catalyst ? Give one example of its importance.
4. Why acetic acid is a weaker acid than formic acid ? Explain.
5. Write mechanism of epoxidation of alkenes.
6. What are annulenes ? Give one example.
7. Out of vinyl halide and alkyl halide which is more reactive and why ?
8. Which isomer of  $C_3H_{12}$  has least boiling point and why ?

1×8=8

## PART—B

## SECTION—I

**Note** :— Attempt any **two** questions, each question carries 4½ marks.

9. (a) What is difference between inductive and electromeric effect ? 1½
- (b) Define hydrogen bond. What are conditions for its formation ? Explain types of hydrogen bonds and their consequences. 3
10. (a) Define carbenes. Write note on their types, structure and generation. 3½
- (b) Calculate formal charge on nitronium ion and methylene carbene. 1
11. (a) Discuss Wurtz reaction with mechanism. What are its limitations ? 2½
- (b) Discuss evidences in favour of free radical mechanism of halogenations of alkanes. 2

## SECTION—II

**Note** :— Attempt any **two** questions, each question carries 4½ marks.

12. (a) Dehydration of both 1-butanol and 2-butanol give same product mixture. Explain the formation of products giving mechanism of the reaction. 2½
- (b) Discuss the mechanism of addition of hypohalous acid to alkenes. 2

13. (a) How do you account for acidic character of ethyne ? 2½
- (b) Discuss mechanism of addition of water to alkyne. 2
14. Compare and contrast  $S_N1$  and  $S_N2$  reaction mechanisms. Discuss various factors which affect these reaction mechanisms. 4½

### SECTION—III

**Note** :— Attempt any **two** questions, each question carries 4½ marks.

15. (a) Discuss Baeyer's strain theory. What are its limitations ? 3
- (b) Write a note on banana bonds in cyclopropane. 1½
16. (a) What are aromatic, antiaromatic and non-aromatic compounds ? Give one example of each. 3
- (b) How will you convert benzene into :
- (i) acetophenone
- (ii) chlorobenzene ? 1½
17. (a) Discuss the mechanism of nitration of benzene clearly indicating  $\sigma$  and  $\pi$ -complexes. Draw energy profile diagram for the same. 2½
- (b) Chlorine is deactivating but *o,p*-directing. Explain. 2