(180-PA-403331C) Roll No. .....

PAPER ID—10146

B. Sc. EXAMINATION, 2024

(Fourth Semester)

ORGANIC CHEMISTRY (THEORY)

Code : CH-403

Time : 3 Hours *Maximum Marks : 29*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : The question paper consists of nine questions. Attempt *Five* questions in all. Q. No. 1 is compulsory and contains five short answer type questions and carries 5 marks. All questions carry in Section A, B, C, and D equal marks. Attempt *one* question in each Section A, B, C, and D and all the parts of that question must be attempted.

1. (a) What is necessary condition for absorption of IR by a molecule ?

   (b) Name *two* reagents used to oxidise alcohol into aldehydes.

   (c) Why are amines basic in nature ?

   (d) What are Diazonium Salts ?

   (e) What is the range of infrared radiation covered in infrared spectroscopy ? 5×1=5

Section A

2. (a) Explain the principle of IR spectroscopy. 3

   (b) How can you differentiate between the following using IR spectroscopy ? 3

   (i) CH_3CHO and C_2H_5OH.

https://www.haryanastudy.com

(ii) C_2H_5OH and CH_3COOH.

(iii) HCHO and C_6H_5OH.

3. (a) Which of the following diatomic molecules do not absorb in IR region (give reasoning) ?

(i) HCl

(ii) O_2

(iii) N_2.

(b) Write short notes on the following :

(i) Fermi-resonance

(ii) Overtone

(c) How many fundamental absorption bands are expected to be found in IR spectrum of acetone and CO_2 ? 2+2+2= 6

Section B

4. (a) Arrange the following amines in increasing order of basic strength and explain the order CH_3NH_2, $(CH_3)_2NH$, and $(CH_3)_3N$ (in aqueous solution).

(b) Give the mechanism of Hoffmann bromoamide reaction. 3+3= 6

5. (a) What is Hinsberg's reagent ? How can it be used to distinguish between 1°, 2°, and 3° amines ? 3

(b) Write short notes on the following : 3

(i) Diazotisation.

(ii) Coupling reaction.

Section C

6. (a) Write the mechanism of coupling of diazonium salt with phenol. 3

(b) How can you prepare ? 3

(i) 1, 2, 3, 5- tetrabromobenzene from aniline

(ii) Benzene from benzendiazonium chloride.

7. (a) Why does nitrobenzene undergo electrophilic substitution reaction at m-position ? 3

(b) How will you convert the 7following ? 3

(i) Nitrobenzene into aniline.

(ii) Nitrobenzene into m-dinitrobenzene.

Section D

8. (a) Write the reaction and mechanism of benzoin condensation. 3

(b) Why aldehydes are more reactive than ketones ? 3

9. (a) Which of the following compounds will undergo haloform reaction or not ? Explain with reasoning : 3

(ii) Ethanal

(iii) Benzaldehyde.

(b) Explain benzoin condensation with mechanism. 3