(6 pages) Reg. No. : .....

Code No. : 30481 E **Sub. Code : CMCH 62**

B.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2024.

Sixth Semester

Chemistry — Core

ORGANIC CHEMISTRY — III

(For those who joined in July 2021-2022 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Acidity of phenol is due to ————
   (a) Benzene ring
   (b) Phenolic group
   (c) Hydrogen bonding
   (d) Resonance stabilization of its anion

2. Nitro phenols are ———— than phenols.
   (a) More basic (b) More acidic
   (c) Less acidic (d) None

3. The reagent used for the conversion of acetamide to methyl amine is ————
   (a) PCl_5 (b) $NaOH/Br_2$
   (c) Na/C_2H_5OH (d) P_2O_5

4. Benzidine rearrangement involves the formation of ————
   (a) nitrene
   (b) carbonium ion
   (c) carbanion
   (d) di protonated intermediate

5. The shift to a longer wavelength is known as ————
   (a) Blue shift
   (b) Red shift
   (c) Hyperchromic effect
   (d) Hypsochromic effect

6. Which of the following is a chromophore group?
   (a) NH_2 (b) –OH
   (c) $–NO_2$ (d) NR_2

7. Camphor is ————

(a) mono cyclic (b) bicyclic

(c) tricyclic (d) tetracyclic

8. Citral on oxidation gives ————

(a) citric acid

(b) dipentene

(c) geranic acid geraniol

(d) geraniol

9. The number of signals obtained for ethyl methyl ketone is ————

(a) 1 (b) 2

(c) 3 (d) 4

10. Which of the following molecules exhibit IR spectra ————

(a) H_2 (b) N_2

(c) Cl_2 (d) CO

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) What is Houben reaction and Hoesch synthesis?

Or

(b) Discuss the mechanism of Gattermann reaction.

12. (a) Explain the mechanism of beckmann rearrangement.

Or

(b) Discuss the mechanism of benzidine rearrangement.

13. (a) Explain the terms :

(i) Chromophore

(ii) Auxochrome.

Or

(b) Explain the following suitable examples.

(i) Triphenyl methane dye

(ii) Indigo dyes.

14. (a) Explain Hoffmann exhaustive methylation with suitable example.

Or

(b) Explain the determination of structure of citral.

15. (a) Write notes on the following :

(i) Chemical shift

(ii) Spin-spin coupling.

Or

(b) Explain how IR spectra are useful in differentiating intermolecular and intramolecular hydrogen bonding.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) Discuss the mechanism of

(i) Benzoin condensation

(ii) Cannizaro reaction.

Or

(b) Discuss the mechanism of perkin and claisen condensation.

17. (a) Explain the mechanism of Wagner-Meerwin rearrangement with suitable example.

Or

(b) Discuss the mechanism of Pinacol – Pinacolone rearrangement.

18. (a) How will you prepare the following dyes?

(i) Malachite green

(ii) Phenolphthalein.

Or

(b) Discuss in detail the different types of classifications of dyes with suitable examples.

19. (a) Discuss the structural elucidation of camphor and its synthesis.

Or

(b) Discuss the structure of piperine.

20. (a) Explain with illustration how IR spectroscopy is used to identify the functional group.

Or

(b) How many types of NMR signals are to be expected on the spectrum of the following compounds.

(i) ISO butane

(ii) Propionic acid

(iii) 1-chloropropane

(iv) Benzyl alcohol.

———————