

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2023****(Supplementary – 2018 Admission)****CHEMISTRY COMPLEMENTARY COURSE FOR PHYSICS, BOTANY AND ZOOLOGY****ACHE3C03T: ORGANIC CHEMISTRY****Time: 3 Hours****Maximum Marks: 64****PART A: Answer *all* the questions. Each carries *one* mark.**

1. What are carbocations? Give an example.
2. What are diastereomers?
3. State and explain Huckel's rule of aromaticity.
4. How is phenolphthalein prepared?
5. Which is more basic methylamine or ammonia? Why?
6. What is meant by nucleotide?
7. State and explain isoprene rule.
8. Give one method of preparation of phenol from chlorobenzene.
9. What is meant by diazotization?
10. Name any two disaccharides.

**(10 x 1 = 10 Marks)****PART B: Answer any *seven* questions. Each carries *two* marks.**

11. Arrange the acids, acetic acid, chloroacetic acid, dichloroacetic acid and trichloroacetic acid, in the increasing order of their acidities. Justify your answer.
12. What are *meso* compounds? Give an example.
13. What are deactivating groups? Give any two examples.
14. How is methyl orange prepared?
15. Illustrate Kolbe electrolysis.
16. What are the factors which cause denaturation of a protein?
17. What is meant by optical activity? Which types of compounds exhibit this property?
18. Draw the conformations of cyclohexane. Which is more stable? Why?
19. How does benzene undergo sulphonation and what is the product obtained?
20. State four important characteristics of enzyme action.

**(7 x 2 = 14 Marks)****(PTO)**

**PART C: Answer any *four* questions. Each carries *five* marks.**

21. Discuss the stability of the different kinds of carbocations.
22. Explain the optical isomerism of lactic acid.
23. What is meant by Friedel-Crafts alkylation? Give an example and give its mechanism.
24. Discuss Luca's test for distinguishing different types of alcohols.
25. Make a general comparison of the rates of nucleophilic addition for aldehydes and ketones and explain.
26. Explain the structure and the physiological effects of nicotine.

**(4 x 5 = 20 Marks)**

**PART D: Answer any *two* questions. Each carries *ten* marks.**

27. Discuss and illustrate the significance of the various electron displacement effects in organic molecules.
28. How is benzene diazonium chloride prepared? Explain any five synthetic applications of it.
29. (a) Explain the double helical structure of DNA.  
(b) What are the differences between DNA and RNA.
30. What is meant by  $S_N^2$  reaction? Citing an example, discuss its mechanism and stereochemistry.

**(2 x 10 = 20 Marks)**