

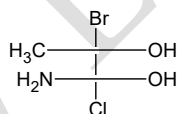
M.Sc. - Chemistry
I Semester End Examination - May 2022
Organic Chemistry-I

Course Code: MCH102T
Time: 3 hours

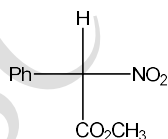
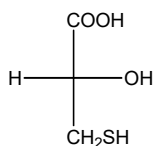
QP Code: 11008
Total Marks: 70

Instruction: Answer Question No.1 and any FIVE of the remaining.

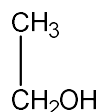
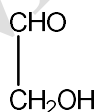
1. Answer any **TEN** questions (10 X 2 = 20)
- a) Explain tautomerism with suitable example.
- b) What is homoaromatic compound? Give an example.
- c) Write a short note on micelles.
- d) State the Curtin-Hammett principle.
- e) Arrange the following acids in the increasing order of acidity:
Formic acid, acetic acid, $\text{Cl}_3\text{CSO}_3\text{H}$, $\text{CF}_3\text{SO}_3\text{H}$
- f) Give an example for an ambident nucleophile.
- g) Convert the following compound into Newman and sawhorse projection formulae:



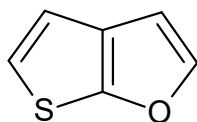
- h) Assign D/L and R/S nomenclature of the following compounds:



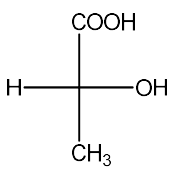
- i) Identify (if any) the prochiral groups and faces in the following molecules:

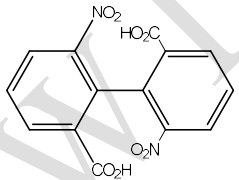


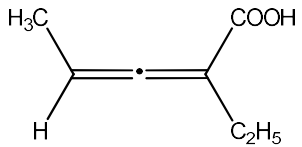
- j) Propose any two methods of synthesis of thiazole.
- k) Give the IUPAC name for the following heterocycles:



- l) Why is β -D-glucose more stable than α -D-glucose?

- 2.a) Comment on the aromaticity of annulenes and heteroannulenes.
b) What is hyperconjugation? How does it useful in explaining the stability of olefins and carbocations.
c) Outline briefly the bonding pattern in C-60 fullerenes. **(4+3+3 = 10)**
- 3.a) What are synthetic molecular receptors? Highlight their significance.
b) Write a brief account on cyclodextrins.
c) Write any two methods for generation of carbenes. Write any two addition reactions. **(4+3+3 = 10)**
- 4.a) Furnish in detail, the concept of thermodynamic and kinetic control of a reaction taking the example of the reaction of an unsymmetrical ketone with a base.
b) Explain how the nature of substrate, nucleophile and leaving group affect the rate of SN^1 and SN^2 reactions. **(5+5 = 10)**
- 5.a) Give a brief account on isotope labeling studies in the determination of reaction mechanism.
b) Give a short note on Cram's rule of asymmetric induction.
c) State and explain the Cahn-Ingold-Prelog (CIP) rules. **(4+3+3 = 10)**
- 6.a) Write the cause of optical isomerism in the following compounds:
- 




- b) Explain the terms enantiotopic and diastereotopic groups and faces with suitable examples.
c) Discuss the optical activity of allenes citing proper examples. **(4+3+3 = 10)**
7. a) Illustrate the use of HIO_4 in the determination of ring size of D- glucose.
b) Sketch the synthesis of Uronic acid.
c) Propose any two reactions of coumarins. **(4+3+3 = 10)**
8. a) Write the structure elucidation of maltose.
b) Write any two methods of synthesis of isoxazole. **(7+3 = 10)**
