Roll No. | | | | | | | | | | | | **Total No. of Pages : 03**

Total No. of Questions : 09

B.Sc. Honours (Microbiology) (Sem.–1)

CHEMISTRY-I

Subject Code : BSMB-103-19

M.Code : 78981

Date of Examination : 12-01-2023

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) State Heisenberg's uncertainty principle.

b) Write down Schrodinger wave equation.

c) Write down electronic configuration of Na atom.

d) Draw the chemical structure of 2-methyl-l-cyano butane.

e) Define heterolytic fission with suitable example.

f) Give two examples of carboanions.

g) Write down the example of conformational isomers of any organic compounds.

h) Define diastereomers with suitable example.

i) What is achirotopic centre? Give example.

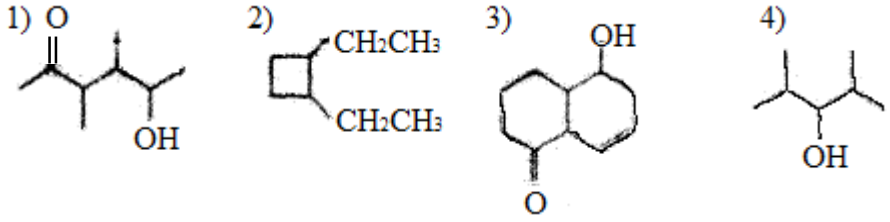
j) Define optical isomerism.

SECTION-B

2. Draw all constitutional isomers of C_4H_9Br and identify the isomer(s) that possess chirality centers.

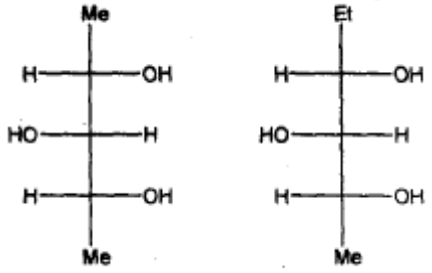
3. Write short notes on Pauli's exclusion principle and Hund's rule of maximum multiplicity.

4. Determine the number of stereoisomers for the following compounds and explain your answer:



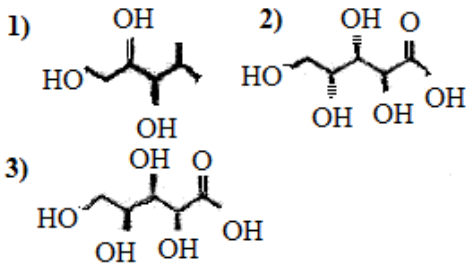
5. Draw both chair conformations for each of the following compounds. In each case, identify the more stable chair conformation: (i) Methylcyclohexane; (ii) trans-1,2-Di isopropylcyclohexane.

6. Draw bond line structures using wedges and dashes for the following compounds:



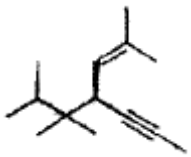
SECTION-C

7. Draw a Fischer projection for each of the following compounds, placing the CO_2H group at the top:



8. An aqueous solution containing 10 g of optically pure fructose was diluted to 500 mL with water and placed in a polarimeter tube 20 cm long. The measured rotation was found as –5.20°. Calculate the specific rotation of fructose. If the solutions were mixed with 500 mL of a solution containing 5 g of racemic fructose; what would be the specific rotation of the resulting fructose mixture? What would be its optical purity?

9. Assign the configuration of the chirality center in the following compound:



Draw the two stereoisomers of 3-isopropylcyclohexanol. Which is more stable conformation of each stereoisomer?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.