

B.Sc. Biotechnology 1st Semester

ORGANIC CHEMISTRY—A

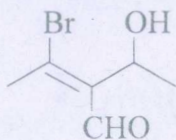
Paper—BT-4

Time Allowed—Three Hours] [Maximum Marks—40

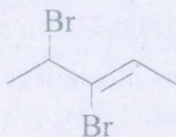
SECTION—A

Note :— Attempt **ALL** questions. Each question carries 1 mark.

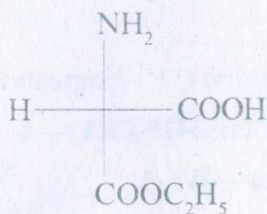
1. Write the most stable conformation of 1, 4-dihydroxy-cyclohexane.
2. Why halogenation of alkane in the presence of tetramethyllead takes place even in dark ?
3. Assign E/Z configuration to the following alkene :



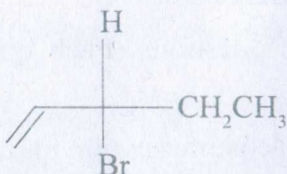
4. Assign E/Z configuration to the following alkene :



5. Assign R/S configuration to the following compound:



6. Assign R/s configuration to the following compound :



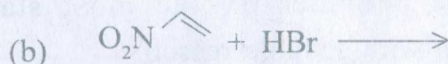
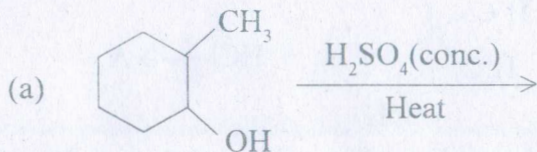
7. Vinyl chloride is less reactive than ethyl chloride towards $\text{S}_{\text{N}}2$ reaction, why ?
8. Out of 1-chloro-hexane and cyclohexyl-chloride, which one would be more reactive towards $\text{S}_{\text{N}}2$ reaction and why ? 8×1=8

SECTION—B

Note :— Attempt any **FIVE** questions. Each question carries equal marks.

9. Justify the statement, "Bromination of alkanes is more selective than chlorination although chlorination is faster than bromination".

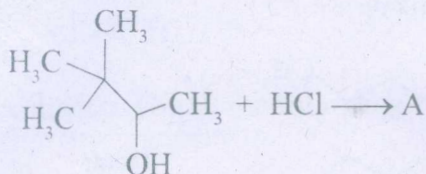
- 10) What are the various conformations of n-butane ?
Discuss their relative stability using energy profile diagram.
11. Complete the following reactions and provide suitable mechanisms :



12. Justify why trans-2-methyl-1-chlorocyclohexane reacts with alc. KOH at a much slower rate than its cis-isomer ?
13. Enlist the differences between enantiomers and diastereomers.
14. Justify the statement, "Walden inversion does not necessarily mean optical inversion".
15. How do the products differ when ethyl bromide reacts separately with aqueous KOH and alcoholic KOH ?
16. Write down the major differences between S_N1 and S_N2 reaction. 5×4=20

Note :— Attempt any **TWO** questions. Each question carries equal marks.

17. (a) Provide the structure and suitable mechanism for the following reaction : 4



- (b) Draw possible conformations of cis-1, 3-dimethylcyclohexane and identify the most stable conformation with suitable reason. 2
18. Taking the example of cis- and trans- but-2-ene, explain the fact that bromination of alkene is a stereospecific reaction. 6
19. Explain with examples the various methods for the resolution of a racemic mixture. 6
20. Write all the possible products along with mechanism, arising from substitution and elimination reaction of the following : 6

