

2022

Chemistry

B.Sc. Third Semester End Examination - 2022

PAPER - CC7T

Full Marks : 40

Time : 2 hours

*The figures in the right-hand margin indicate marks.  
Candidates are required to give their answers in their own  
words as far as practicable.  
Illustrate the answers wherever necessary.*

**Group-A**

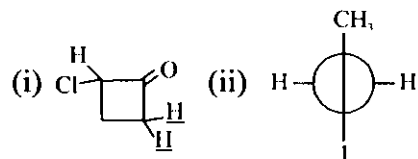
**Answer any five from the following : 5×2=10**

1. What do you mean by buttressing effect? Give example.
2. Define valence tautomerism with example.
3. What is the difference between “Kinetic isotope effect” and “non-Kinetic isotope effect”? Explain with example.

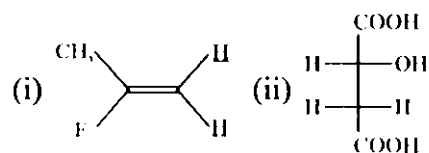
*(Turn Over)*

( 2 )

4. Compare the acidities of  $\text{CH}(\text{NO}_2)_3$  and  $\text{CH}(\text{CN})_3$ .
5. What happens when but-2-yne is treated with Li metal in a mixture of liquid  $\text{NH}_3$  and  $\text{EtO/t}$ ?
6. Although the addition of HCl to either 1-butene or 2-butene gives the same product, the reaction with 1-butene is faster – Explain.
7. Deduce the topic relationship of the marked homomorphous ligand with reason.



8. Assign pro-R/ Pro-S/ Pro-E/ Pro-Z of the marked homomorphous ligand.

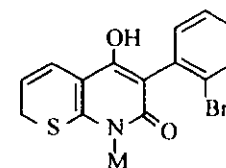


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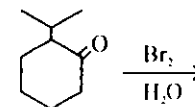
**Group -B**

Answer any four from the following : 4×5=20

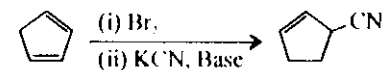
9. (a) Draw the structural formula of the Ra conformation of the compound represented by the formula below.



- (b) Write the product with mechanism of the following reaction.



- (c) Explain this result with mechanism. 1+2+2=5



( 4 )

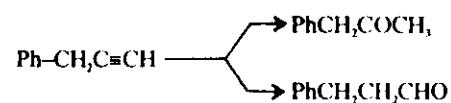
10. (a) Compare between conformational isomerism and tautomerism.
- (b) Draw the -Sc Conformation of 2,3,-disromo butane (thres) and comment on its polarity with reaction.

(2½+2½=5)

11. (a) Compare and explain with the help of conformational analyses the dipole moments of ethane-1, 2-di of and 1,2-dichloroethane.
- (b) Cumulene with odd number of double bond shows cis/hang isomeriom where as with even number of double bond shows optical isomerism (Pa....) Explain.

(3+2=5)

12. (a) How would you carry out the following transformation? Give mechanism.

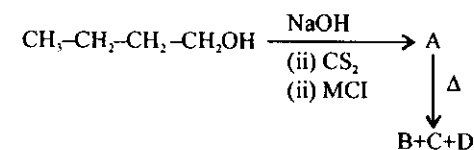


- (b) Pro-R hydrogen of propanoic acid is replaced by Br with retaution of configuration. Draw the structure and assign the confisuation.

3+2=5

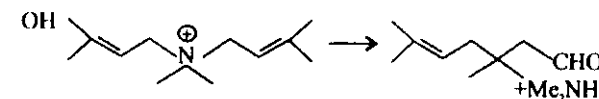
( 5 )

13. (a) Compare the basicities of aniline and p-nitroaniline.
- (b) Predict the product of the following reation



- (c) Give an example of asymmetric allene. 3+2=5

14. (a) Carry out the following transformation and show the mechanism.



- (b) Convert 1-butene to 2-butene. 3+2=5

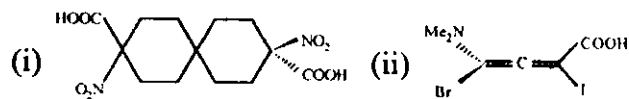
( 6 )

Group-C

Answer any one of the following

15. (a) Draw the energy profile diagram of three step endothermic reaction in which the second step is r.d.s and the first unstable intermediate is more stable than the second.

(b) Assign the R<sub>a</sub>/S<sub>a</sub> nomenclature to of the following.



(c) Draw the torsion angle energy profile diagram of n-butane along C<sub>2</sub>-C<sub>3</sub> bond and identify the conformations and conformer.

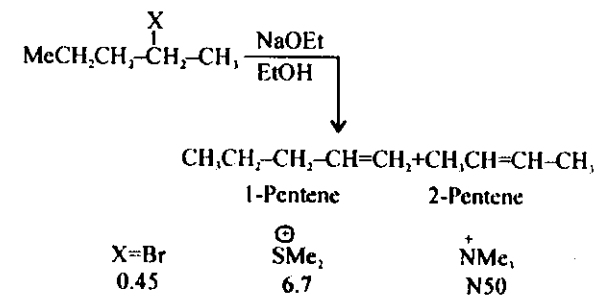
(d) Draw the most stable conformation of 2-amino alcohol and assign its P/a1 description.

$$2\frac{1}{2} + 2 + 4 + 1\frac{1}{2} = 10$$

( 7 )

16. (a) Chlorination of isobutene produces 1-chloro-2-methyl propane and 2-chloro-2-methyl propane in the ration 64:36 but bromination furnishes 1-bromo-2-methyl propane and 2-bromo-2-methyl propane in the ration 1:99. Explain.

(b) Account for the following change in the ratio of 1-pentene to 2-pentene as the leaving group changes.



( 8 )

(c) Write down the product(s) expected in each of the following reaction.

