2023

Chemistry

B.Sc. III Semester End Examination - 2023

PAPER - CC-7T

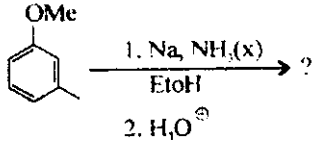
Full Marks : 40 *Time : 2 hours*

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

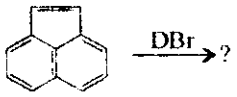
1. Answer any five questions : **5×2=10**

(a) Predict the product of the following reaction and give plausible mectianism.



(b) What do you mean by atrropisomerism? Give example.

(c) Write down the product with stereo chemistry.



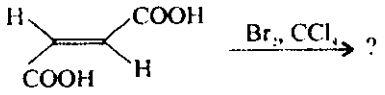
(d) Convert :

(Z)-2-Butene → (E)-2-Butene.

(e) Draw the energy profile diagram of an exothermic reaction shown below.

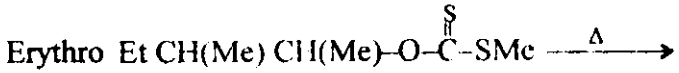
Reactant $\underset{K_{-1}}{\overset{K_1}{\rightleftharpoons}}$ Intermediate $\underset{K_{-2}}{\overset{K_2}{\rightleftharpoons}}$ Product.

(f) Write down the product with plausible mechanism.



(g) Draw the (–) sc and (+) ap conformation of active butane-2,3-di-ol.

(h) Write down the product with mechanism.

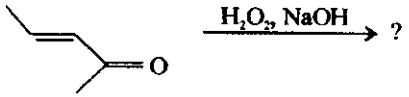


Group - B

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

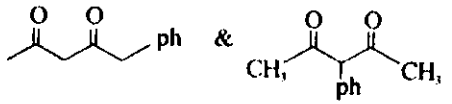
2. (a) Addition of HBr to 1,3-butadiene yield two product and the product composition demends on temp. Write the products and explain with the help of energy profile diagram. 3

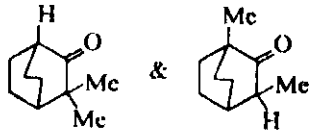
(b) Write down the product of the following reaction with mechanism. 2



3. (a) Explain the Hammond's postulate with a suitable example. 3

(b) Which of the following pairs has greater enot content in gas phase and why (any one) 2

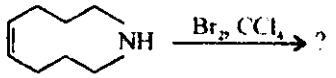
(i) 

(ii) 

4. Convert :

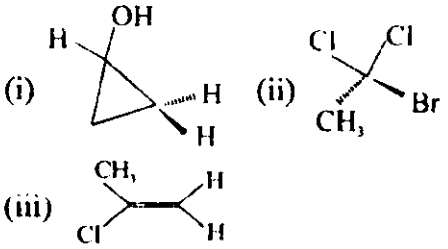
   (a) But-2-yne → (±)-2,3-Butane diol

   (b) Predict the product with mechanism. $2\frac{1}{2}+2\frac{1}{2}$

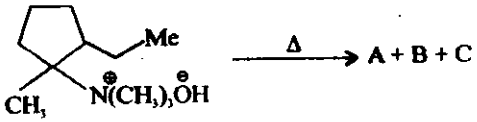


5. (a) Outline a general mechanism for radical addition of f HBr to $CH_3CH=CH_2$. Why peroxide effect is only observed in case of HBr and not in case of HCl or HI. 3

   (b) Assign pro-R/ pro-S or pro-E/pro-Z of the marked homomorphic ligand (any two) 2

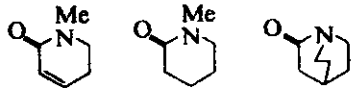


6. (a) Give the structures of all possible alkenes formed when compound 1 is heated Rank these products in the increacsing order of their relative amounts produded.



$2\frac{1}{2}$

   (b) Arrnage the following compounds in increasing order of basicity. Justify your answer.

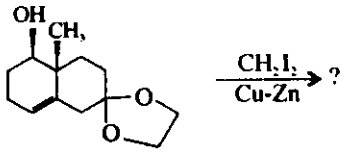


$2\frac{1}{2}$

7. (a) Predict the product (major) of the following reaction and Explain. $2\frac{1}{2}$

   2-tert-butyl-3, 3-dimethyl-1-butane

   (b) Predict the product with mechanism. $2\frac{1}{2}$



Group - C

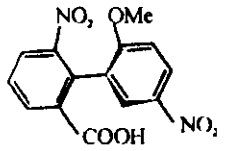
Answer any one from the following. **10×1=10**

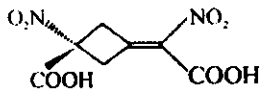
8. (a) Ozonolysis reaction passes through a zwitter ion and carbonyl intermediate. –Explain.

   Give evidence in faour of the mechanism. 2

(b) What are carbenes? What happens when diozomethane is protolyzed and the product is allowed to react with allene? 3

(c) Assign Ra/Sa naming of the following. $1\frac{1}{2}+1\frac{1}{2}$

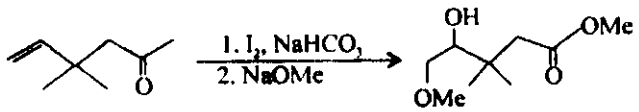
(i) 

(ii) 

(d) What is buttressing effect? Explain with proper example. 2

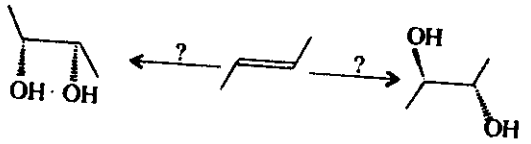
9. (a) Draw the torsion angle energy profile diagram of n-butyl chloride for c_1–c_2 and c_2-c_3 bond rotation. 3

(b) Explain this result with mechanism. 2

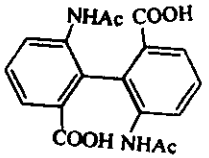
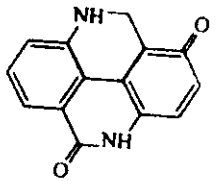


(c) Transform the following with suitable reagent and show

the mechanism. $1\frac{1}{2}+1\frac{1}{2}$



(d) Which of the following compounds is resolvable at room temp and why? 2

(i) 

(ii)