

**B.Sc. Semester-II Examination, 2023****CHEMISTRY [Honours]**

Course ID : 21412      Course Code : SH/CHEM/202/C4

Course Title : Organic Chemistry II

**[OLD SYLLABUS]**

Time : 1 Hour 15 Minutes

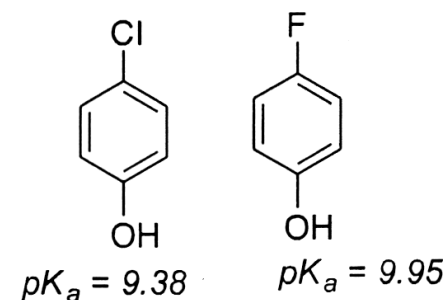
Full Marks : 25

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

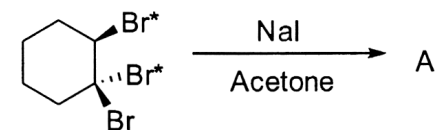
1. Answer any **five** questions: 1×5=5
- Which of the following is an ambient nucleophile?  
 $\text{HCO}_2^-$ ,  $\text{EtO}^-$ ,  $\text{PhO}^-$
  - What is 'prostereogenic centre'?
  - Which conformation of 1-Bromopropane is more stable?
  - Define the term 'dihedral angle'.
  - Chloral (Trichloroacetaldehyde) remains in hydrate form– Explain.
  - What is 'Buttressing Effect'?

*[Turn Over]*

- g) Account for the acidity difference of the following compounds:

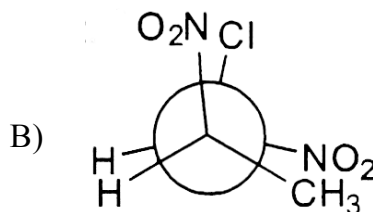
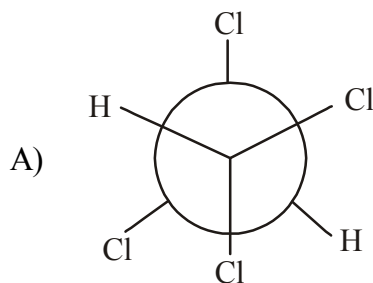


- h) Predict the structure of A:



2. Answer any **two** questions: 5×2=10
- Allene containing even numbers of carbon with different substituents at both the terminal carbon atom are optically active – comment.
    - What is called Butane-gauche interaction? Draw the potential energy diagram of ethylene glycol for the rotation about C–C bond and label the maxima and minima with appropriate conformation. 2+3=5

- b) i) Designate the following conformations according to Klyne-Prelog method:

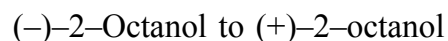


- ii) Define Torsion angle. How it is different from Dihedral angle?

- iii) What is crossover experiment?

$$2+2+1=5$$

- c) i) Carry out the following Conversion:



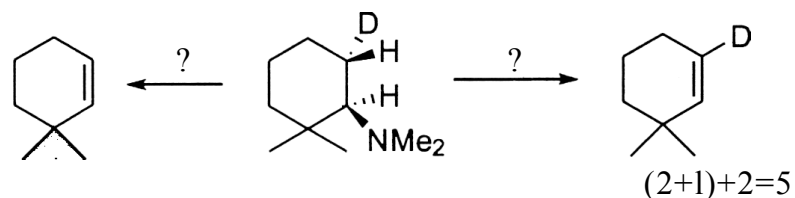
- ii) Predict the product(s) with proper mechanism:

$$2+3=5$$



- d) i) What are the differences between a Transition state and an Intermediate? Give one example of Secondary Kinetic Isotope Effect.

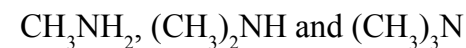
- ii) Carry out the following transformations:



3. Answer any **one** question:

$$10 \times 1 = 10$$

- a) i) A) Arrange the following compounds in order of their decreasing basicity in aqueous medium:



- B)  $\text{CH}_2(\text{SCH}_3)$  is more acidic than  $\text{CH}_2(\text{OCH}_3)_2$ — Explain.

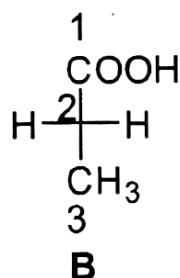
- ii) A) Account for the change in enol-content of acetyl acetone with changing solvent:

CH <sub>3</sub> COCH <sub>2</sub> COCH <sub>3</sub>	% of enol	Solvent
	92	Hexane
	15	Water

B) Give one example for ring-chain tautomerization.

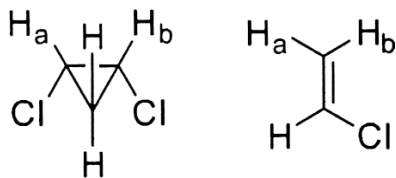
iii) What are Crown Ethers? How their presence effects the rate of  $S_{N1}$  and  $S_{N2}$  reactions?  $(2+2)+(2+1)+(1+2)=10$

b) i) C-2 in the carboxylic acid **B** is both prostereogenic and prochiral.– Explain.

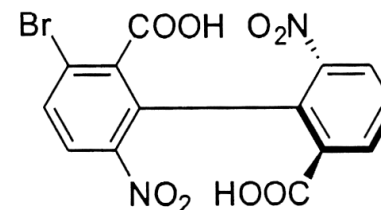


ii) An alcohol is stronger base than thiol in aqueous solution but the reverse is true in gas phase.– Explain.

iii) Find the spatial relationship (Homotopic/ Enantiotopic/Diastereotopic) between  $H_a$  and  $H_b$  in the following compounds with explanation:



iv) Predict the absolute configuration ( $R_a/S_a$ ) of the following compound:



v) Discuss ElcB mechanism with one example.  $2+2+2+2+2=10$

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