

## B.Sc. 5th Semester (Honours) Examination, 2024 (CBCS)

Subject : Chemistry

Course : CC-XII

(Organic Chemistry)

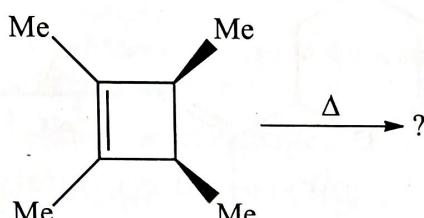
Time: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer *any five* questions:

2×5=10

- (a) Give the product when furan reacts with diazomethane.  
 (b) Identify the expected product of the following reaction:



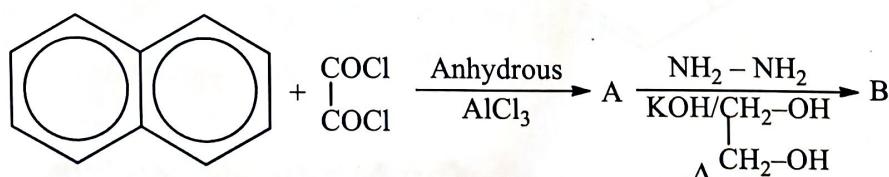
- (c) Draw the most stable chair conformer of  $\alpha$ -D-fructopyranose.  
 (d) What is a co-enzyme? Give an example.  
 (e) What happens when anthracene is heated with N-Methyl-N-Phenyl formamide in presence of  $\text{POCl}_3$ ?  
 (f) State the product of hydramine fission on (-) ephedrine.  
 (g) Why is sucrose unable to show reducing property?  
 (h) Write down the most stable conformation of trans-1, 3-dimethyl cyclohexane. Is it optically active?

2. Answer *any two* questions from the following:

5×2=10

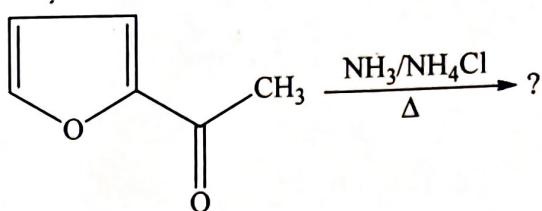
- (a) (i) Identify A & B in the following reaction sequence:

1+1



- (ii) In the acetolysis of cis- and trans- isomers of 2-acetoxy cyclohexyl tosylate, the trans-isomer reacts about 700 times faster than the cis-isomer. —Explain. 3

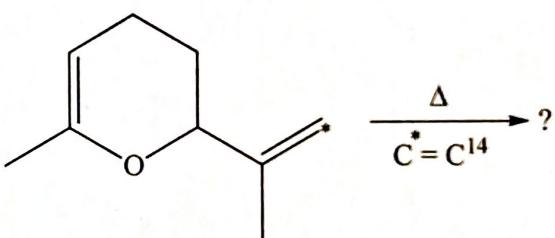
(b) (i) Write down the product of the following reaction with mechanism: 1+2

(ii) How ( $\pm$ )- $\alpha$ -Terpineol be prepared from methyl vinyl ketone (MVK) using Diels-Alder reaction? 2

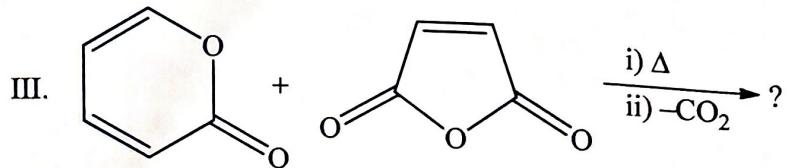
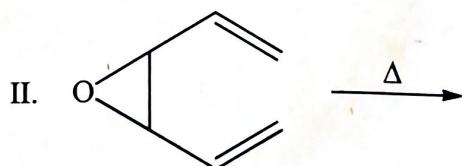
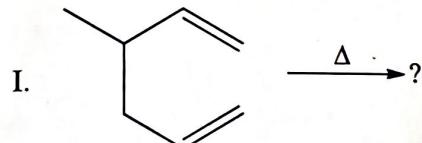
(c) (i) Write the structure of "Sanger's reagent". Write a reaction showing how it could be used to identify the N-terminal amino acid of Val-Ala-Gly. 1+2

(ii) Give the structure and colour of the compound formed in the reaction of isoleucine and ninhydrin. 2

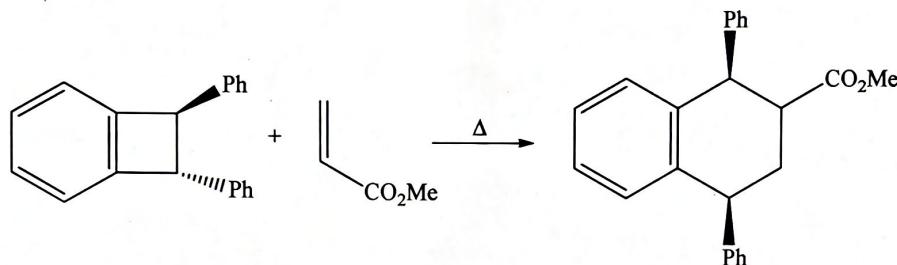
(d) (i) Predict the product with explanation: 3



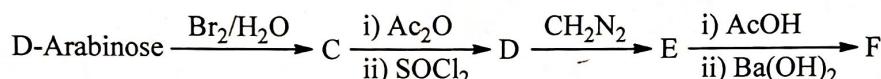
(ii) How would you obtain D-arabinose from D-glucose? 2

3. Answer *any two* questions from the following: 10 $\times$ 2=20(a) (i) Write down the products of the following reactions and predict the stereochemistry of the product wherever possible: 2 $\times$ 3

(ii) Rationalise the following thermal reaction by FMO: 4



(b) (i) Identify C to F in the following reaction sequence: 4



(ii) Mutarotation of D-glucose is facile in presence of 2-hydroxypyridine instead of mixture of pyridine and phenol. Explain. 3

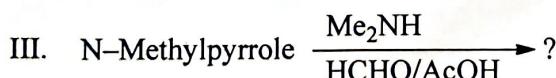
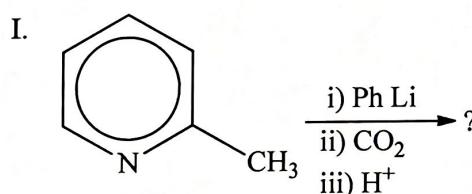
(iii) Convert  $\alpha$ -terpineol into terebic acid. 3

(c) (i) What is Merrifield resin? Show the steps in the synthesis of the dipeptide Gly-Ala in the solid phase with the help of the resin. 1+3

(ii) Outline a chemical method for determination of C-terminal amino acid of a protein. 3

(iii) Synthesize  $\text{RCH}_2\text{CH}(\text{NH}_2)\text{COOH}$  from  $\text{RCHO}$ . 2(iv) Name the amino acid which gives lactic acid when treated with  $\text{HNO}_2$ . 1

(d) (i) Write down the structure of products formed in the following reactions: 2x3=6



(ii) Convert : Quinoline to 8-hydroxyquinoline. 2

(iii) What happens when piperidine is subjected to Hoffmann exhaustive methylation? Show the steps. 2