

B.Sc. Semester-V Examination, 2022-23**CHEMISTRY [Honours]**

Course ID : 51412 Course Code : UG/CHEM/502/C-12

Course Title : Organic Chemistry-V

Time : 1 Hour 15 Minutes

Full Marks : 25

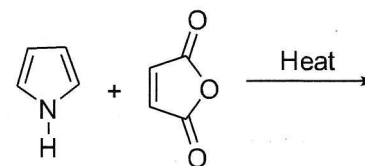
*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any **five** of the following questions:

1×5=5

- What is isoelectric point of an amino acid?
- What do you mean by denaturation of DNA?
- Draw π -molecular orbital (LUMO) of 1,3-butadiene in the ground state.
- Write down the Fischer projection structure of β -D-Glucopyranoside.
- Draw all possible chair conformation for *trans*-1, 2-dimethylcyclohexane.
- What happens when anthracene treated with dil HNO_3 ?

[Turn Over]

g) Give the product(s) of the following reaction:

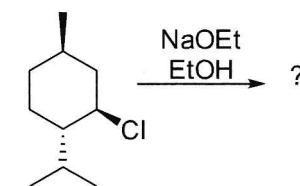
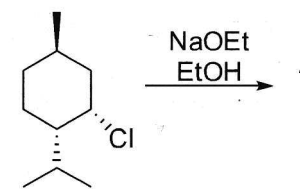


h) Write down the name of C-3 epimer of D-Ribose.

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

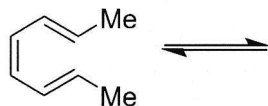
5×2=10

- Compare the rate of chromic acid oxidation of *cis* and, *trans* 4-*t*-butylcyclohexanol.
 - Predict the product of the following reactions:

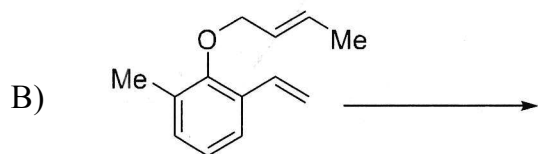
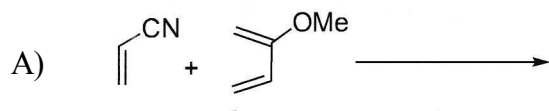


3+2=5

- b) i) Using Haworth's synthesis how will you prepare 2-methylnaphthalene?
 ii) Naphthalene has relatively less aromatic character as compared to benzene —comment. $4+1=5$
- c) i) Predict the product (with geometry) of the following reaction according to the Woodward Hoffmann rule and Draw the FMO of the transition state.

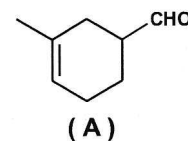


- ii) Predict the product(s) of the following reactions



$(2+1)+1+1=5$

- d) i) (2Z,4Z,6Z)-2,4,6-Octatriene is being cyclised by thermal process. Showing FMO interactions explain the formation of the product.
 ii) A student wrote the following Diels-Alder adduct (A) from isoprene and acrolein. Is it correct? Give appropriate reasoning.



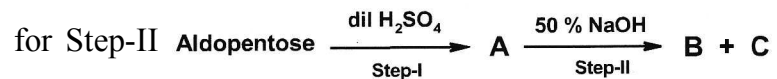
$3+2=5$

3. Answer any **one** of the following question:

$10 \times 1 = 10$

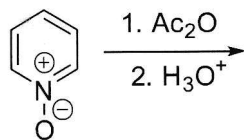
- a) i) Amino acids produce Purple-Blue color with ninhydrin.—Explain.
 ii) What is Sanger's reagent? How can you detect the N-terminal amino acid of a peptide with this reagent?
 iii) Show the H-bonds present among the base pairs of DNA.

- iv) Identify the products A-C in the following sequence of reaction and suggest a mechanism

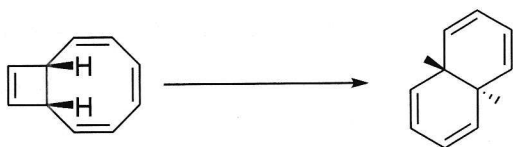


$$2+3+2+3=10$$

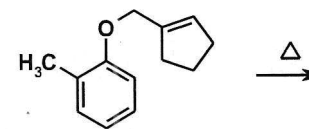
- b) i) Outline briefly the chemical strategy for the synthesis of tripeptide Lys-Phe-Ala following the Merrifield solid phase synthetic method.
- ii) Predict the product(s) and provide arrow pushing mechanism.



- iii) The reaction given below is believed to proceed by sequence of two electrocyclic reactions-Identify them.



- iv) Identify the product(s) of the following reaction with proper explanation:



$$3+2+2\frac{1}{2}+2\frac{1}{2}=10$$
