

U.G. 5th Semester Examination - 2021

CHEMISTRY

Course Code : BCEMCCHC502

Course Title : Organic Chemistry

Full Marks : 30

Time : 2 Hours

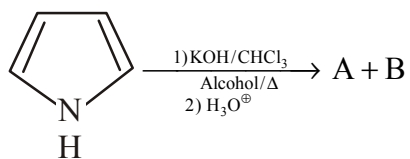
The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **ten** of the following questions:

1×10=10

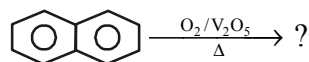
a) What is 'A' and 'B' in the following reaction?



b) Draw the Haworth projection for β -D-ribofuranose.

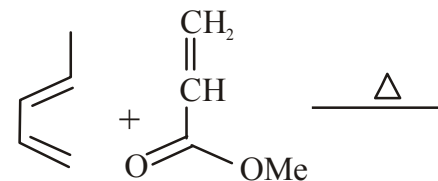
c) What product(s) are formed when alanine is treated with nitrous acid?

d) Write the product in the following reaction:

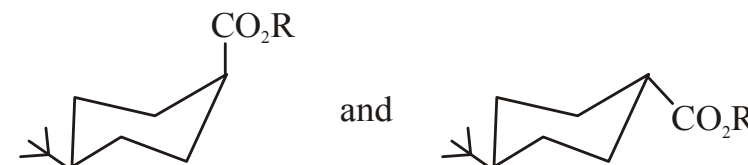


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e) Write the major product in the following reaction:

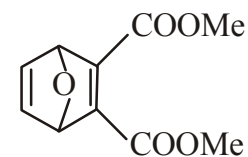


f) Which of the following compounds gives faster rate of saponification reaction?

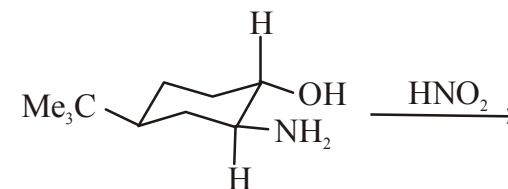


g) Write the hydrogen bonded structure of A-T base pairing in DNA.

h) Identify the diene and dienophile components for the synthesis of the following compound:



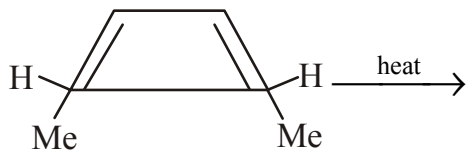
i) Complete the following reaction:



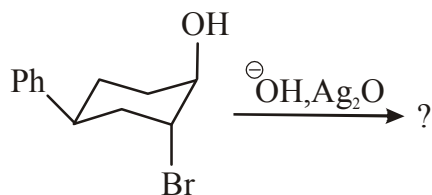
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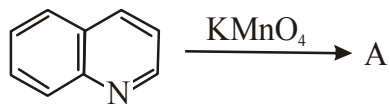
- j) Give the stereochemical product of the following reactions:



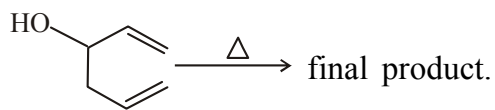
- k) What is the relationship between D-sorbose and D-fructose?
 l) Identify major product of the following reaction:



- m) Draw the structure of the phenyl-thiohydantoin derivative of L-valine.
 n) Identify A:



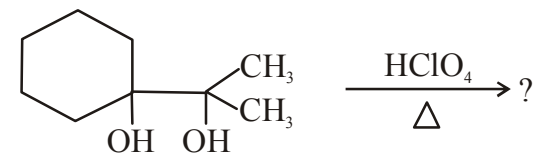
- o) What is the final product in the following reactions?



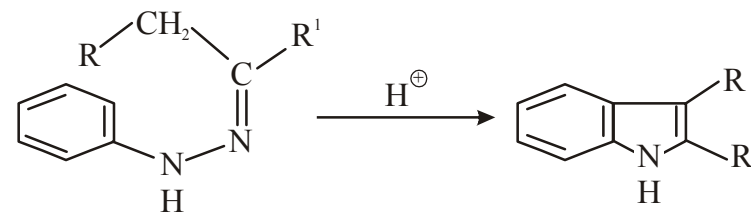
2. Answer any **five** of the following questions:

2×5=10

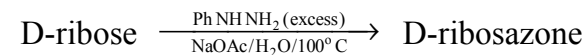
- a) Write the product with giving mechanism for the following reaction:



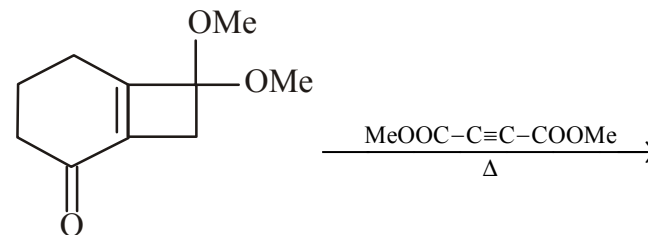
- b) Show the mechanism for the following reaction:



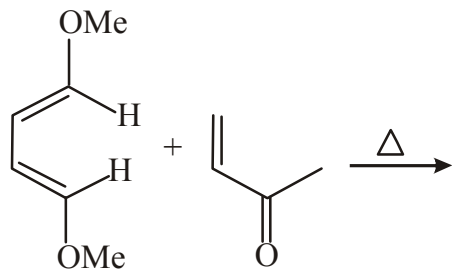
- c) Write the mechanism of the following:



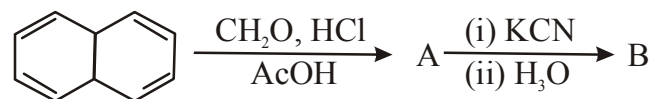
- d) Predict the product in the following reaction and name the each steps involved:



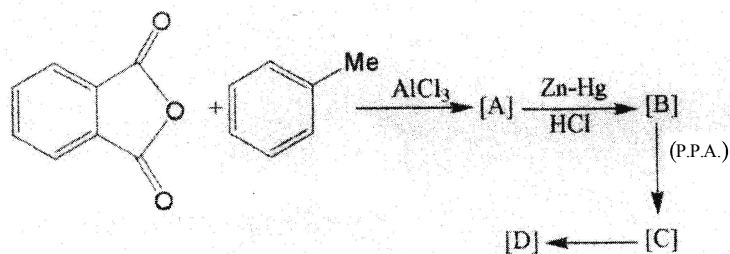
- e) Write a reaction showing how 2, 4-dinitrofluorobenzene could be used to identify the N-terminal amino acid of the peptide Ala Val Gly.
- f) Use endo rule to predict the product of the following cycloaddition:



- g) Identify A and B in the following reaction:

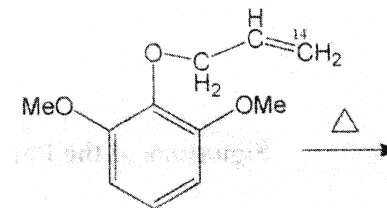


- h) Predict the structures of A, B, C and D:

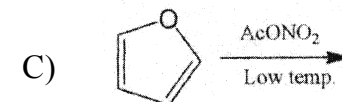
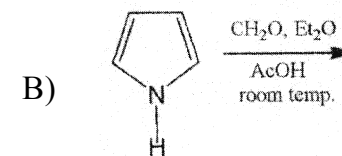
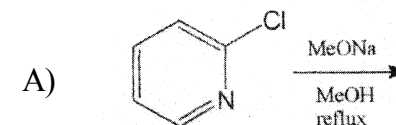


3. Answer any **two** from the following: $5 \times 2 = 10$

- a) i) Predict the product of the following reaction with suitable mechanism: 2



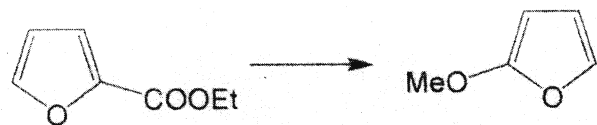
- ii) What are the products in the following reactions? 3



- b) i) Show why D-glucose and D-mannose are epimeric sugars. Which of the sugars react with HIO_4 faster and why? Why

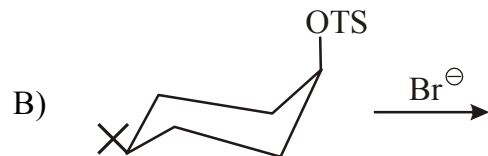
HIO_4 is preferred in comparison to $\text{Pb}(\text{OAc})_4$ in the oxidation reactions of sugars? 3

ii) How would you make the following conversion? 2



c) i) Write the structure of major product for the reaction between maleic anhydride and cyclopentadiene on heating. Explain its formation. 2

ii) Write the product of the following reactions and explain their formation:



3
