2022

CHEMISTRY

[Honours]

B.Sc. Sixth Semester End Examination - 2022

PAPER - C-14T

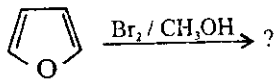
Full Marks : 40 ***Time : 2 hours***

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

Answer any five questions : - **2×5=10**

1. Predict the product of the following reaction with plasible mechanism. 2

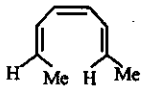


2. What is nucleotide? Write down the structure of a ribonucleotide. 1+1

3. Cis-Cyclonexane-1,3 dicarboxylic acid readily forms anhydride. – explain. 2

4. How do you explain the non-reducing property of sucrose? 2

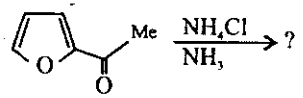
5. Predict the product of the following reaction and explain on the basis of FMO theory. 2



6. Convert : D-arabinose to D-mannose. 2

7. Define denaturation of protein. 2

8. Complete the following reaction with appropriate mechanism.



2

Group - B

Answer any four from the followings. **4×5=20**

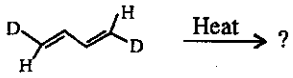
9. (a) Define 'Isoelectric point' of an amino acid with a suitable example. 2

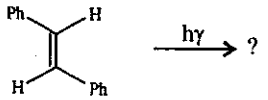
(b) Outline the mechanism of Knorr pyrrole synthesis. 3

10. (a) Show the reaction steps in Skraup quinoline synthesis with mechanism. 3

(b) Name and state the functions of different types of RNA present in cell. 2

11. Identify the products of the following reaction showing frontier orbital interaction.

a) 

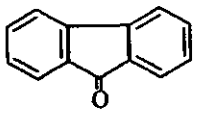
b) 

11. (a) Define Mutarotation. Explain the phenomen by taking the example of glucose. 1+2

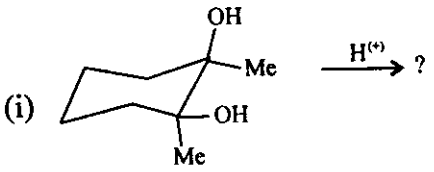
(b) In-terms of relative stability of the inter-mediates explain the orientation of electrophilic substution reaction of pyrrole. 2

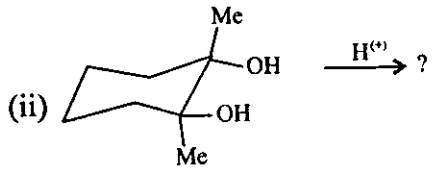
12. (a) What is Sanger's reagent? Discuss the application of this reagent. 1+2

(b) Carry out the following transformation

Phenanthraquinone ⟶  2

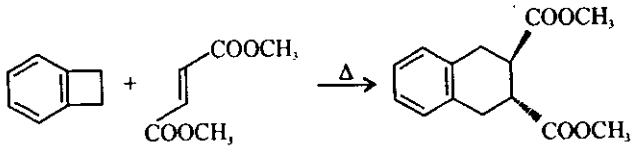
13. (a) Predict the product of the following reactions and give appropriate mechanism.

(i) 

(ii) 

$(1\frac{1}{2}+1\frac{1}{2})$

(b) Account for the following observation.



2

14. (a) Show the H-bonds present among the base pairs of DNA. $1\frac{1}{2}+1\frac{1}{2}$

(b) Write down the structures of A,B,C,D and complete the reaction sequence. 2

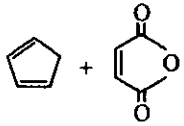
D-Glucose $\xrightarrow[\text{Base}]{NH_4OH}$ A $\xrightarrow[NaOAe]{AC_2O}$ B $\xrightarrow{-ACOH}$ C $\xrightarrow[MeOH]{NaOMe}$ D

Group - C

C. Answer any one of the following question. 1×10=10

15. (a) Discuss Howorth. Synthesis of phenanthrene. 3

(b) Predict the products of the following reaction and explain with the help of secondary orbital interaction.

 $\xrightarrow{\Delta}$ A (Major) + B (Minor) 2

(c) What is anomeric effect? Explain with suitable example. 3

(d) Furan can be regarded as masked 1,4 dicarbonyl compound– explain. 2

16. (a) Describe the process of Merrified solid phase synthesis of polypeptide. 3

(b) Explain the mechanism of Osazone formation. Why osazone formation does not proceed beyond first two carbons? 2+1

(c) Write down the major product obtained when pyridine is heated with $NaNH_2$ in dry toluene. 2

(d) Oxidation of D-fructose with Tollen's reagent yields a mixture of D-mannonic acid & D-Gluconic acid– Explain. 2