(b) Define genetic code. Give at least three characteristics of genetic code. (4.5)

(c) Differentiate between competitive and non-competitive enzyme inhibition and give examples of each kind. (4)

7. (a) Discuss various steps involved in the glycolysis cycle, giving the names of enzymes and structures of intermediates. (6)

(b) List any two reactions that were not explained by the open chain structure of glucose. How does the cyclic hemiacetal structure of glucose explain them. (4)

(c) Define ω – fatty acids giving suitable example. (2.5)

8. (a) How will you convert :

(i) D-Glucose to D- Arabinose.

(ii) D-Glucose to D-Fructose. (4.5)

(b) List four important characteristic of Watson and Crick model of DNA. (4)

(c) Discuss the 2° structure of proteins. (4)

[This question paper contains 4 printed pages.]

27.12.2023(M)

Your Roll No.....

Sr. No. of Question Paper : 4324 **G**

Unique Paper Code : 32171501

Name of the Paper : Organic Chemistry IV : Biomolecules

Name of the Course : **B.Sc. (Hons.) Chemistry**

Semester : V

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **6** questions.
3. **All** Questions carry equal marks.

1. (a) (i) Give the sequence of reactions to establish the pyranose ring size in glucose? (3)

(ii) Draw Fisher projection and Haworth structure of β-D-Fructofuranose. (3)

(b) A pentapeptide, X with empirical composition, Phe-2, Lys, Trp, Tyr was recovered unchanged on treatment with Trypsin. DNFB treatment of X

followed by hydrolysis gave DNP-Tyr. Partial acid hydrolysis of X gave two tripeptides with the following amino acid composition :

1. Phe,Tyr,Trp

2. Phe, Trp,Lys

Elucidate the sequence of amino acids in X. Give the products of treatment of X with Chymotrypsin. (6.5)

2. (a) Draw the complimentary DNA sequence of the given fragment specifying the direction 5'—ATGC—3'. (4.5)

(b) Draw the structure of glyceryl trilinoleate and calculate its iodine value. (4)

(c) Fructose contains a ketonic group, yet it reduces Tollens' reagent and Fehling's solution. Why? Give the mechanism and name of reaction involved. (4)

3. (a) (i) How is pyruvate converted to ethanol under anaerobic conditions? Name the enzyme and give the reaction involved. (3.5)

(ii) ATP is called the universal currency of cellular energy. Explain giving its hydrolytic pathway. (3)

(b) Give the complete name and structure of

(i) dAMP

(ii) UDP (4)

(c) What are cofactors? Give an example. (2)

4. (a) Give the structure of the disaccharide sucrose. What is its IUPAC name? Account for the observation that it does not reduce Fehling's solution and it does not mutarotate. (3)

(b) Give the mechanism of osazone formation for D-glucose. D-Glucose and D-Fructose give the same osazone. Explain. (3.5)

(c) How would you synthesize the tripeptide, Ala-Gly-Ala using solid phase peptide synthesis. (6)

5. (a) Explain the mechanism of action of chymotrypsin. (6)

(b) What are drying and non-drying oils? Give one example of each type. (4)

(c) What is denaturation of protein? How it is caused? (2.5)

6. (a) An α- D – methylglycoside, X, with molecular formula $C_7H_{14}0_6$, consumes 2 moles of HIO_4 and gives one mole of HCHO. Arrive at possible structure/s of X. (4)

P.T.O.