

- (c) Why sucrose is known as an invert sugar? How do you account for the fact that sucrose does not reduce Fehling solution? Write Haworth projection formula for sucrose. (4,4,4.5)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6136

E

Unique Paper Code : 32175912

Name of the Paper : GE Molecules of Life

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

Semester : II / IV

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 **six** questions in all.
 3. **All** questions carry equal marks.
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1. (a) Differentiate between fats and oil. Give the skeletal structure of a lipid which on hydrolysis yields glycerol, stearic acid and comment on its physical properties.

(b) Write down the structure of glyceryl trioleate.

Calculate its iodine number (Molecular weight of glyceryl trioleate: 884, atomic weight of iodine: 127). Write its significance.

(c) What are glycolipids. Discuss their biological significance and write down the structure of glycolipid derived from one molecule each of sphingosine, palmitic acid and β -D-glucose.

(4,4,4.5)

2. (a) Write the Merrifield synthesis of the dipeptide Phe-Val. Discuss the advantages of solid phase synthesis.

(b) What is denaturation of proteins? Explain with suitable examples.

7. Write short notes on **any three** of the following :-

(a) DNA Replication

(b) lock and key mechanism

(c) Glycolysis

(d) Amylose and Amylopectin (4,4,4.5)

8. (a) What do you understand by essential fatty acids?

Give name and structure of any two essential fatty acids.

(b) Define isoelectric point. Calculate isoelectric point of arginine

Given $pK_a(\text{COOH}) = 2.17$, $pK_a(\text{NH}_3^+) = 9.04$,

$pK_a(\text{side chain}) = 12.48$

- (iv) Circle each anomeric carbon of the hydrolyzed products of above sugar.
- (b) Draw Fischer and Haworth Projection of β -D-fructofuranose and β -D-glucopyranose.
- (c) Write the reaction for the formation of glucosazone. Explain glucose and fructose gives same osazone derivative. (4,4,4.5)
6. (a) (i) Write the structure and biological importance of cholesterol.
- (ii) Define calorific value of food. What is the standard calorific content of Proteins and Fats?
- (b) Outline the steps involve in Citric acid cycle.
- (c) What is fermentation? Discuss lactic acid and ethanol fermentation. (4,4,4.5)

- (c) When a nonapeptide undergoes partial hydrolysis, it forms dipeptides, a tripeptide and two tetrapeptides whose amino acid compositions are shown. Reaction of the intact nonapeptide with Edman's reagent releases PTH-Leu. What is the sequence of the nonapeptide?
- (i) Pro, Ser
- (ii) Gly, Glu
- (iii) Met, Ala, Leu
- (iv) Gly, Ala
- (v) Glu, Ser, Val, Pro
- (vi) Glu, Pro, Gly, Pro
- (vii) Met, Leu
- (viii) His, Val (4,4,4.5)

3. (a) Draw the structure of a fragment of DNA showing A-T and G-C pairing.

(b) What is the difference between nucleosides and nucleotides? Give the structure of Guanosine-5'-monophosphate.

(c) How do you differentiate between Transcription and Translation? (4,4,4.5)

4. (a) Differentiate between reversible and irreversible inhibition of enzyme activity.

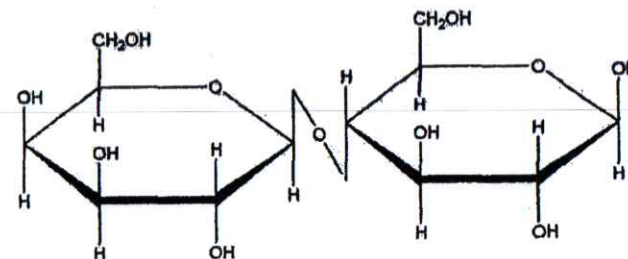
(b) Explain the binding role of the following in determining the structure activity relationship of a drug :

(i) -OH group

(ii) -NH₂ group

(c) Explain the effect of temperature and pH on the activity of enzymes. (4,4,4.5)

5. (a) Study the following structure and answer the questions below :



(i) Write the name of above sugar. Is it reducing or non-reducing sugar?

(ii) What is the name of the enzyme that would be required for someone to be able to digest above sugar?

(iii) If the glycosidic bond is hydrolyzed, what are the names of the monosaccharides (include the alpha or beta name) produced.