



Murugan.

**Avinashilingam Institute for Home Science and Higher Education for Women**  
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)  
Re-accredited with 'A++' Grade by NAAC. Recognised by UGC Under Section 12B.  
Coimbatore - 641 043, Tamil Nadu, India

**Continuous Internal Assessment I – August 2024**

**Semester I**

**Class : I UG**  
**Major: Biochemistry & Biotechnology**

**Time: 2 hours**  
**Max. marks: 60**

**23BBCC01 Introduction to Biochemistry and Biomolecules**

- CO1: Understand the fundamental knowledge and basic concepts and principles of biochemistry.  
CO2: Assess about the structure and functions of biomolecules in living system  
CO3: Understand the physical and chemical properties of biomolecules.  
CO4: To impart knowledge on the structure and biologically important complex biomolecules.  
CO5: To study the nature, physical and electrochemical properties of amino acids in proteins.

**Part A**

**6 x 1 = 6**

**Choose the correct answer**

- All the following monosaccharides exhibit optical rotation EXCEPT **CO3K3**  
a) Glucose b) Arabinose d) glyceraldehyde d) dihydroxyacetone
- Lobry de Bruyn-Van Ekenstein rearrangement of related sugars occurs by the action of **CO3K3**  
a) Strong alkali b) Dilute alkali c) strong acid d) mild acid
- How many stereoisomers are possible for glucose? **CO3K3**  
a) 4 b) 8 c) 16 d) 32
- Isomers that differ in their configuration about hemiacetal or hemiketal atom are **CO3K1**  
a) Epimers b) Anomers c) Diastereoisomers d) Enantiomers
- Ionic product of water is **CO1K1**  
a) Constant above boiling point of water  
b) Constant at a particular temperature  
c) Constant below freezing point of water  
d) Constant at all temperature
- A lubricant present in joint is **CO4K2**  
a) Heparin b) hyaluronic acid c) Heparan sulfate d) chondroitin sulfate

**Part B**

**3 x 6 = 18**

**Answer the following**

**Answers should not exceed 400 words or two pages**

- (a). Discuss the ionization of water. **CO1K2**  
(or)
- (b) Discuss the structure and biological importance of glycosides and deoxy sugars. **CO3K2**
- (a) Write the Fischer and Haworth Projection of  $\alpha$ -D-glucose and  $\beta$ -D-glucose. What is the preferred conformation for  $\alpha$ -D-glucose? **CO2K3**  
(or)

8. (b) i) Why glucose, fructose, and mannose are forming the same type of osazone? Explain.

ii) Why sucrose is not able to form osazone? Explain. **CO3K4**

9. (a) i) What are reducing sugars? Explain the difference between reducing and non-reducing sugar with examples.

ii) Why polysaccharides are not able to reduce Barfoed's reagent? **CO2K3**

(or)

9. (b) i) Differentiate between beta and alpha glycosidic linkages with examples.

ii) Why beta glycosidic linkages are not able to broken down by human digestive system?

iii) How does the orientation of the  $\beta$ -D-glucose units affect the structure of cellulose?

**CO2K4**

**Part C**

**3 x 12 = 36**

**Answer ALL questions**

**Each answer should not exceed 800 words or four pages**

10. (a) Elaborate on water as a reactant and fitness of the aqueous environment. **CO1K2**

(or)

10. (b) Give a detailed account of structure and biological importance of sucrose, lactose and maltose. **CO2K1**

11. (a) Discuss the occurrence, structure and biological importance of heparin, hyaluronic acid and chondroitin sulphate. **CO3K3**

(or)

11. (b) Summarize the importance of structural polysaccharides with illustration. **CO2K2**

12. (a) Elaborate the structure and biological importance of storage polysaccharides

**CO2K2**

(or)

12. (b) Discuss the structural and functional role of bacterial cell wall polysaccharides.

**CO3K2**

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55 + 110

50 copies