22ZOU628

# PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

## BSc DEGREE EXAMINATION MAY 2025
(Sixth Semester)

Branch – **ZOOLOGY**

## BIOCHEMISTRY

Time: Three Hours Maximum: 50 Marks

### SECTION-A (5 Marks)
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (5 x 1 = 5)

1 What is the process called when a monosaccharide undergoes a change in its optical rotation in solution?
(i) Hydrolysis (ii) Mutarotation
(iii) Oxidation (iv) Reduction

2 Which of the following best explains the significance of hydrogen bonds in water?
(i) They increase the boiling point of water
(ii) They make water a good solvent for nonpolar molecules
(iii) They decrease the surface tension of water
(iv) They reduce the specific heat capacity of water

3 _____ bonds is responsible for the secondary structure of proteins?
(i) Peptide bonds (ii) Hydrogen bonds
(iii) Disulfide bonds (iv) Ionic bonds

4 Which of the following is NOT a component of a nucleotide?
(i) Phosphate group (ii) Sugar
(iii) Amino acid (iv) Nitrogenous base

5 What is the primary role of the TCA cycle in cellular metabolism?
(i) To produce ATP directly
(ii) To generate reducing agents (NADH and $FADH_2$) for the electron transport chain
(iii)To break down fatty acids
(iv) To synthesize glucose

### SECTION - B (15 Marks)
Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Explain the phenomenon of mutarotation in monosaccharaides. Provide an example of a monosaccharide that undergoes mutarotation.

OR

b Describe the formation of sugar alcohols from monosaccharaides. Give an example of a sugar alcohol and its biological significance.

7 a Define lipids and classify them into major groups. Provide one example for each group.

OR

b Discuss the role of cholesterol in maintaining cell membrane integrity.

8 a State the biological significance of amino acids.

OR

b Discuss on the factors affecting enzyme activity.

**Cont...**

9 a Define nucleoside and nucleotide and explain the difference between them.

OR

b Explain the basic principle of electrophoresis and its application in nucleic acid analysis.

10 a Give the significance of glycolysis in cellular energy production.

OR

b Outline the process of transamination and its role in amino acid metabolism.

## SECTION -C (30 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Compare the reactions of monosaccharides leading to the formation of sugar acids and osazones. What are the biological implications of these reactions?

OR

b Compare and contrast the structure and biological significance of starch and glycogen.

12 a Enumerate the emulsifying property of lecithin. Include the Properties and function.

OR

b Discuss on the structure and biological significance of water. How do hydrogen bonds contribute to its unique properties?

13 a Explain the denaturation of proteins and its impact on protein function.

OR

b Pointout the role of diagnostic enzymology in identifying myocardial infarction.

14 a Differentiate between the A, B, and Z forms of DNA.

OR

b Evaluate the role of chromatography in the analysis of nucleic acids.

15 a Narrate the steps of glycolysis and the energy derived from this pathway.

OR

b Evaluate the role of the urea cycle in nitrogen excretion.

Z-Z-Z END