QP Code: PV25DRSI002

Reg. No : ....
Name : ....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

I SEMESTER (CBCSS - VPG) DEGREE EXAMINATIONS, NOVEMBER 2025

(Regular/Improvement/Supplementary)

M. Voc. Applied Biotechnology

GEC1AB02 : Biochemistry

2024 Admission Onwards

Time: 3 Hours **Maximum Weightage: 30**

Part A

*Short answer type questions. Answer **any four**. Weightage **2** for each.*
(4x2 = 8 Weightage)

1. Mention the different components of nucleic acids.
   a) Write the structure of a purine base.
   b) Write Chargaff's rule of base equivalence.
2. Define polysaccharides and discuss the basic structure and properties of homopolysaccharides. Provide examples to illustrate your points.
3. Recall the two main phases of the pentose phosphate pathway.
4. List the main steps of glycolysis and name the key enzymes involved.
5. Distinguish between competitive, non-competitive, and uncompetitive enzyme inhibition, and analyze their effects on Km and Vmax.
6. Compare the structural formulas of maltose, lactose, and sucrose, highlighting the monosaccharide units and the type of bond connecting them.
7. Investigate the roles of maltose, lactose, and sucrose in food and nutrition, considering their structural properties. How do these properties affect their use in different dietary contexts?

Part B

*Short essay-type questions: Answer **any four**. Weightage **3** for each.*
(4x3 = 12 Weightage)

8. Explain the biochemical pathway of the urea cycle and its key intermediates.
9. Explain the roles of cytochromes and iron-sulfur centers in the electron transport chain.
10. Analyze the concept of activation energy and its role in enzyme catalysis.
11. Discuss how Michaelis-Menten and Lineweaver-Burk plots contribute to understanding of enzyme activity and their respective advantages and limitations.

Turn Over

12. Demonstrate how changes in Km can indicate differences in enzyme–substrate affinity.
13. Suggest a lipid rich diet for a person needing high energy intake.
14. Demonstrate the conversion of pyruvate to ethanol in alcoholic fermentation, indicating enzymes involved.

Part C

Essay-type questions: Answer ***any two****. Weightage* ***5*** *for each.*
(2x5 = 10 Weightage)

15. Explain how feedback regulation controls enzyme activity in a pathway.
16. Illustrate the metabolic pathways of alpha, beta, and omega oxidation, highlighting their specific roles and significance.
17. Explain the classification of vitamins.
18. Explain in detail about the classification, structure, and properties of monosaccharides, oligosaccharides, and polysaccharides.

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