647510 **BSc5MicC502x** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (CBCS) Examination
March/April-2026 (NEW COURSE)
Prokaryotic Metabolism(Core)

Time: 2:30 Hours **Marks:70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A) Give specific answers. (04)

1. What is meant by metabolism?
2. Expand the word ATP.
3. Enzymes act as the main catalysts in metabolic reactions. (True / False)
4. Identify the law of thermodynamics stating that energy can neither be created nor destroyed: _____ (First / Second / Third).

Que.1(B) Answer in Brief. (Any one out of two) (03)

1. Write a short note on the concept of free energy.
2. Explain the role of ATP in metabolism.

Que.1(C) Write a Note on. (Any one out of two) (07)

1. Derive the Michaelis–Menten equation.
2. Explain the various types of reversible enzyme inhibition, giving suitable examples for each type.

Que.2(A) Give specific answers. (04)

1. List any two alternative names for the TCA cycle.
2. Glycolysis occurs in the _____. (Mitochondria / Cytosol)
3. State the total number of ATP molecules synthesized from the complete breakdown of one molecule of glucose.
4. Conversion of glucose to glucose-6-phosphate is a common step in both glycolysis and the pentose phosphate pathway. (True / False)

Que.2(B) Answer in Brief. (Any one out of two) (03)

1. Explain in detail the Entner–Doudoroff pathway.
2. Describe the key reactions involved in the catabolism of amino acids.

Que.2(C) Write a Note on. (Any one out of two) (07)

1. Discuss in detail the process of β-oxidation of fatty acids.
2. Give a brief overview of the TCA cycle along with its regulatory mechanisms.

Que.3(A) Give specific answers. (04)

1. Mention any two examples of photosynthetic bacteria.
2. State the location where the electron transport chain (ETC) operates in an animal cell.
3. ATP is a _____. (Nucleotide / Nitrogen base)
4. List any two isotopes used for studying biosynthesis.

Que.3(B) Answer in Brief. (Any one out of two) (03)

1. Explain the different methods of ATP generation.
2. Describe the basic mechanisms involved in anaerobic respiration.

Que.3(C) Write a Note on. (Any one out of two) (07)

1. Give a brief overview of bacterial photosynthesis.
2. Explain in detail the electron transport chain (ETC).

Que.4(A) Give specific answers. (04)

1. Define the term chemotrophs.
2. Give any two examples of sulfur-oxidizing bacteria.
3. Define the term denitrification.
4. Explain the Halobacterium.

Que.4(B) Answer in Brief. (Any one out of two) (03)

1. Explain the role of iron bacteria in metabolism.
2. Write briefly about lactic acid bacteria.

Que.4(C) Write a Note on. (Any one out of two) (07)

1. Write a short note on nitrogen-fixing bacteria.
2. Explain the fermentative patterns of Gram-negative eubacteria.

Que.5(A) Give specific answers. (04)

1. State the main functions of membrane proteins.
2. List the primary components of membrane lipids.
3. Name the carbohydrate molecules present on cell membranes.
4. Describe the process of passive transport across cell membranes.

Que.5(B) Answer in Brief. (Any one out of two) (03)

1. Explain the mechanisms involved in active transport.
2. Discuss the structure and functions of membrane carbohydrates.

Que.5(C) Write a Note on. (Any one out of two) (07)

1. Briefly explain quorum sensing with an example.
2. Explain the mechanisms involved in signal transduction across cellular membranes.

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