

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2025 (NEW COURSE)
Prokaryotic Metabolism(Core)

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

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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- Que. 1 (A) Objective type questions. (04)
- 1) Why ATP is often called the "energy currency" of the cell?
 - 2) Entropy in biological systems is associated with which type of process?
 - 3) Define an allosteric enzyme with an example.
 - 4) Catabolic reactions are energy-consuming processes that build macromolecules. (State True/False)
- Que. 1 (B) Answer in Brief. (any one out of two) (03)
- 1) State and explain the significance of Gibbs free energy (ΔG).
 - 2) Distinguish between reversible and non-reversible enzymes inhibition.
- Que. 1 (C) Write a Note on. (any one out of two) (07)
- 1) Regulation of enzyme action
 - 2) Role of reducing power in metabolism
- Que. 2 (A) Objective type questions. (04)
- 1) Define: glycolysis
 - 2) What is the significance of The Pentose phosphate pathway?
 - 3) Full form of NADH is _____.
 - 4) What are Stickland reactions?
- Que. 2 (B) Answer in Brief. (any one out of two) (03)
- 1) State the general reactions of amino acids catabolism in short.
 - 2) Give outline the Entner-Doudoroff pathway in bacteria.
- Que. 2 (C) Write a Note on. (any one out of two) (07)
- 1) Glucose metabolism or Glycolysis.
 - 2) The TCA cycle
- Que. 3 (A) Objective type questions. (04)
- 1) Mention one use of isotopic labelling.
 - 2) What is the full form of ETC?
 - 3) Give one example of anaerobic respiration.
 - 4) _____ is the key enzyme is involved in ATP generation?
- Que. 3 (B) Answer in Brief. (any one out of two) (03)
- 1) Explain the function of biochemical mutants.
 - 2) Mention different modes of ATP generation in short.
- Que. 3 (C) Write a Note on. (any one out of two) (07)
- 1) Components of ETC in microbial metabolism
 - 2) Bacterial photosynthesis

- Que. 4 (A) Objective type questions. (04)
- 1) Give an example of methanogenic bacteria.
 - 2) Name a unique feature of the energy metabolism in sulphur oxidizers.
 - 3) Give an example of Chemo-autotrophs.
 - 4) What is the main function of hydrogen bacteria in the environment?
- Que. 4 (B) Answer in Brief. (any one out of two) (03)
- 1) Role of Nitrifying Bacteria in nature.
 - 2) Explain the process of sugar fermentation in gram-negative bacteria.
- Que. 4 (C) Write a Note on. (any one out of two) (07)
- 1) Carbohydrate fermentation in lactic acid bacteria
 - 2) Photophosphorylation in *Halobacterium*.
- Que. 5 (A) Objective type questions. (04)
- 1) Give on point of difference between Active transport and passive transport.
 - 2) Give one example of Mechanosensitive channels.
 - 3) What is signal transduction?
 - 4) Define: Symport transpot
- Que. 5 (B) Answer in Brief. (any one out of two) (03)
- 1) Write a brief note on the phosphotransferase system (PTS).
 - 2) Explain the significance of Quorum sensing.
- Que. 5 (C) Write a Note on. (any one out of two) (07)
- 1) Structure of plasma membrane in bacteria.
 - 2) The passive transport mechanism
