

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov.- 2024 (Old Course)
PROCARYOTIC 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) Answer the following. (Any one out of two) (07)
1. Describe the key steps involved derivation of the Michaelis-Menten equation for Non-Regulatory Enzymes.
 2. Discuss the role of ATP in Energy Metabolism.
- Que.1(B) Attempt any one. (Out of two) (04)
1. Substrate Level Phosphorylation for ATP Generation
 2. What are Allosteric Enzymes? Mention their function.
- Que.1(C) Attempt any three. (Out of five) (03)
1. What Molecule is commonly referred to as the "energy currency" of the Cell?
 2. What is a Precursor Metabolite?
 3. Name one energy-rich compound involved in Metabolism.
 4. What does NADH stand for?
 5. What is Gibbs free energy (G)?
- Que.2(A) Answer the following. (Any one out of two) (07)
1. Explain the process of Glycolysis, including the key steps and enzymes involved.
 2. Describe the process of beta-oxidation of Fatty Acids.
- Que.2(B) Attempt any one. (Out of two) (04)
1. Discuss the Pentose Phosphate Pathway, outlining the main reactions involved.
 2. Describe the net ATP gain from the complete catabolism of One Glucose Molecule.
- Que.2(C) Attempt any three. (Out of five) (03)
1. Which cycle is also known as the Krebs Cycle?
 2. What is the end product of beta-oxidation of Fatty Acids?
 3. Define: Deamination
 4. _____ metabolic pathway generates NADPH and ribose-5-phosphate.
 5. What are the two phases of Glycolysis called?
- Que.3(A) Answer the following. (Any one out of two) (07)
1. Describe the components and the sequence of electron transport chain (ETC) in detail.
 2. Describe the different modes of ATP generation in cells.
- Que.3(B) Attempt any one. (Out of two) (04)
1. Describe the Pigments Involved and process of Bacterial Photosynthesis.
 2. What is an Anaerobic Respiration? Explain in brief.

- Que.3(C) Attempt any three. (Out of five) (03)
1. Name one isotopic element commonly used in Labelling Experiments.
 2. What is a Biochemical Mutant?
 3. _____ Process generates ATP in the absence of Oxygen.
 4. Which molecule donates electrons to the Electron Transport Chain?
 5. Cytoplasmic membrane is the location of electron transports systems in Prokaryotes? (True/False)
- Que.4(A) Answer the following. (Any one out of two) (07)
1. Discuss the role of Nitrifying Bacteria in the Nitrogen Cycle.
 2. Explain: Carbon Assimilation in Methanogens
- Que.4(B) Attempt any one. (Out of two) (04)
1. Ecological Roles of Iron Bacteria.
 2. How lactose is fermented in Gram Negative Enteric Bacteria?
- Que.4(C) Attempt any three. (Out of five) (03)
1. Name one example of a Sulfur-oxidizing Bacterium.
 2. Name one type of archaeobacteria involved in Methane Production.
 3. Archeal cell wall is made up of _____.
 4. Which group of bacteria includes Escherichia Coli and Salmonella?
 5. Define: Chemoautotrophs
- Que.5(A) Answer the following. (Any one out of two) (07)
1. Discuss: Mechanisms of passive transport in Cell Membranes, providing examples of each.
 2. Discuss the various applications of quorum sensing in Bacteria.
- Que.5(B) Attempt any one. (Out of two) (04)
1. Discuss the role of signal transduction in Cellular Communication.
 2. Outline the differences between active and passive transport mechanisms in Cellular Membranes.
- Que.5(C) Attempt any three. (Out of five) (03)
1. Define: Osmosis
 2. What role does the phosphotransferase system play in Bacterial Cells?
 3. What is the main role of Membrane Proteins?
 4. _____type of transport requires energy input from The Cell.
 5. What is Quorum Sensing?
