

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2021 (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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- Q.1(A) **Answer the following questions.** (04)
1. Which functional group is usually attached covalently to modify an enzyme?
 2. Which high energy bonds are present in ATP?
 3. How a cell can maintain reducing atmosphere inside?
 4. What is the characteristic of competitive inhibition of an enzyme?
- Q.1(B) **Answer in Brief. (Any One Out of Two)** (03)
1. Discuss the role of ATP as an energy rich molecule.
 2. Write briefly on need of reducing power in metabolism.
- Q.1(C) **Write a note on. (Any One Out of Two)** (07)
1. Reversible mechanisms of enzyme inhibition.
 2. ΔG^0 and the spontaneity of a chemical reaction.
- Q.2(A) **Answer the following questions.** (04)
1. Which is the unique intermediate of ED pathway?
 2. How many molecules of NADH are produced in one turn of TCA cycle?
 3. Name any two Stickland donor amino acids.
 4. What is the role of ACP in fatty acid synthesis?
- Q.2(B) **Answer in Brief. (Any One Out of Two)** (03)
1. Calculate the net ATP production in EMP pathway.
 2. Write a note on: Anaplerotic reactions.
- Q.2(C) **Write a note on. (Any One Out of Two)** (07)
1. Glyoxylate pathway and its significance.
 2. Anabolic nature of TCA cycle.
- Q.3(A) **Answer the following questions.** (04)
1. Which enzyme catalyses phosphorylation where P_i is involved?
 2. What is isotopic labeling?
 3. Who has proposed the model of rotational catalysis of ATP synthesis?
 4. What is chemiosmotic theory?
- Q.3(B) **Answer in Brief. (Any One Out of Two)** (03)
1. Write a note on: Substrate level phosphorylation.
 2. Write briefly on: Cyclic photophosphorylation in purple sulfur bacteria.
- Q.3(C) **Write a note on. (Any One Out of Two)** (07)
1. Components of ETC.
 2. Methods of studying biosynthesis (any two).
- Q.4(A) **Answer the following questions.** (04)
1. Enlist examples of nitrifying bacteria.
 2. Which vitamin A derivative is involved in proton pump of halobacteria?
 3. Enlist few characteristics of iron oxidizing microbes.
 4. Mention the habitat of hydrogen oxidizing microbes.

- Q.4(B) **Answer in Brief. (Any One Out of Two)** (03)
1. Write a note on: Light driven proton pump of halobacteria.
 2. Write a brief note on: LAB.
- Q.4(C) **Write a note on. (Any One Out of Two)** (07)
1. Sulfur oxidizing chemoautotrophs.
 2. Carbon assimilation in methanogenic archaeobacteria.
- Q.5(A) **Answer the following questions.** (04)
1. Name an autoinducer used by *Vibrio* spp. for bioluminescence.
 2. Write any two examples of mechanosensitive ion channels in bacteria.
 3. Name both the components in 'two component regulation system'.
 4. Name two carbohydrate derivatives present in a bacterial membrane.
- Q.5(B) **Answer in Brief. (Any One Out of Two)** (03)
1. Structure and components of a biological membrane.
 2. Write a note on: Active transport.
- Q.5(C) **Write a note on. (Any One Out of Two)** (07)
1. Quorum sensing mechanism.
 2. Phosphotransferase system.
