647510 **BSCpmeCC5020** **Seat No :_____**

B.Sc. Semester - 5 (*CBCS*) Examination
Oct/Nov. - 2021(Old Course)
PROCARYOTIC METABOLISM (CORE)

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

Instructions:

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

Q.1(A) **Answer the following questions in details. (Any One Out of Two)** (07)

1. Derive Michaelis Menton equation.
2. Regulation of enzyme action.

Q.1(B) **Answer the following questions in Brief. (Any One Out of Two)** (04)

1. Define Enzyme Inhibition and enlist & define each mechanism of enzyme inhibition. Differentiate between them only on the basis V_m & K_m.
2. Discuss role of ATP in metabolism and enlist two examples precursor metabolites.

Q.1(C) **Answer the following question shortly. (Any Three Out of Five)** (03)

1. Lower Km value of an enzyme indicates _____.
2. Define free energy ΔG.
3. Define $K_{m.}$
4. Give full form of NAD & NADP
5. Define Enzyme.

Q.2(A) **Answer the following questions in details. (Any One Out of Two)** (07)

1. Beta oxidation of fatty acid and calculate number of ATP molecules upon complete breakdown of fatty acid with an example.
2. Explain Citric acid cycle and its regulation with the energetics with an example. Also discuss anaplerotic reactions reaction of citric acid cycle.

Q.2(B) **Answer the following questions in Brief. (Any One Out of Two)** (04)

1. Discuss Glycolysis and its regulation.
2. Discuss in detail catabolism of amino acids.

Q.2(C) **Answer the following question shortly. (Any Three Out of Five)** (03)

1. Define Substrate level Phosphorylation.
2. Key enzyme in the pentose-phosphate pathway is _____.
3. _____ is a key intermediate compound in Entner-Doudroff pathway.
4. Comment on Glyoxylate cycle.
5. Give an example of enzyme involved in aminoacid catabolism

Q.3(A) **Answer the following questions in details. (Any One Out of Two)** (07)

1. Bacterial photosynthesis.
2. Different modes of ATP generation.

Q.3(B) **Answer the following questions in Brief. (Any One Out of Two)** (04)

1. Discuss methods of studying biosynthesis.
2. Discuss Anaerobic Respiration.

Q.3(C) **Answer the following question shortly. (Any Three Out of Five)** (03)

1. Define Biochemical Mutant.
2. Define chlorosomes.
3. Give examples of two Electron donor modules in case of bacterial ETC.
4. Define Photoreaction center.
5. The electron transport chain of purple non-sulfur bacteria begins when the reaction center bacteriochlorophyll pair ___, becomes excited by the absorption of light.

Q.4(A) **Answer the following questions in details. (Any One Out of Two)** (07)

1. Energy metabolism and Carbon Assimilation in Methanogens
2. Enlist fermentative patterns of Gram-negative eubacteria and explain any two in detail.

Q.4(B) **Answer the following questions in Brief. (Any One Out of Two)** (04)

1. Discuss Hydrogen Bacteria.
2. Discuss patterns of carbohydrate fermentation in lactic acid bacteria.

Q.4(C) **Answer the following question shortly. (Any Three Out of Five)** (03)

1. Give an example of sulphur oxidizing bacteria.
2. Define nitrification & give an example of Nitrifying bacteria.
3. Name the group of proteins involved in Photophosphorylation in Halophiles.
4. Comment on Rusticyanin
5. Give the name of enzyme involved in nitrogen fixation.

Q.5(A) **Answer the following questions in details. (Any One Out of Two)** (07)

1. Quorum sensing.
2. Enlist the Specific Transport Systems and explain any three in detail.

Q.5(B) **Answer the following questions in Brief. (Any One Out of Two)** (04)

1. Write a note on transport system in which transport of molecules across the membrane does not require an input of energy.
2. Signal transduction.

Q.5(C) **Answer the following question shortly. (Any Three Out of Five)** (03)

1. Give an example of secondary messenger in signal transduction.
2. Give difference between uniport and antiport.
3. Give function of phosphoenolpyruvate: carbohydrate phospho-transferase system.
4. Give two functions of Membrane Proteins.
5. Define Symport.

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