



Seat No. \_\_\_\_\_

**HAK-003-2015010**  
**Third Year B. Sc. (Sem.-V) (CBCS)**  
**Examination**  
**May - 2023**  
**MB-502 : Microbiology**  
*(Bacterial Metabolism)*  
*(New Course)*

**Faculty Code : 003**  
**Subject Code : 2015010**

Time : 2½ Hours / Total Marks : 70

- 1 (a) Objective : 4
- (1) What is  $K_m$  ?
  - (2) Define : Primary metabolites.
  - (3) Give importance of M.M. equation.
  - (4) Define :  $\Delta G$ .
- (b) Answer in brief : (any **one**) 2
- (1) Define Bioenergetics and Entropy.
  - (2) Explain in brief about ATP.
- (c) Answer in detail : (any **one**) 3
- (1) Explain the role of precursor metabolites in metabolism.
  - (2) Secondary metabolites and their significance.
- (d) Write a note on : (any **one**) 5
- (1) Derive Michaelis - Menton equation.
  - (2) Allosteric enzyme.
- 2 (a) Objective : 4
- (1) Where Glyoxylate cycle takes place in the prokaryotic cell ?
  - (2) How many number of ATP are generated by complete oxidation of Palmitic acid ?
  - (3) Under anaerobic condition glucose converted into \_\_\_\_\_.
  - (4) The end product of glycolysis is pyruvate which enters the Citric acid cycle after being converted to \_\_\_\_\_.

- (b) Answer in brief : (any **one**) 2  
 (1) Explain : Deamination.  
 (2) Give importance of hexose monophosphate shunt.
- (c) Answer in detail : (any **one**) 3  
 (1) Explain : Regulation of Glycolysis.  
 (2) Explain : Stickland reaction.
- (d) Write a note on : (any **one**) 5  
 (1) Explain :  $\beta$ -Oxidation  
 (2) Importance and regulation of TCA cycle.
- 3** (a) Objective : 4  
 (1) Name the glycans, present in peptidoglycan structure.  
 (2) What is Proton motive force ?  
 (3) Enlist components of ETC.  
 (4) Give name of end products of non cyclic photophosphorylation.
- (b) Answer in brief : (any **one**) 2  
 (1) Draw a labelled diagram of ATP synthase.  
 (2) Give definition of oxidative phosphorylation. Where it occurs in the cell ?
- (c) Answer in detail : (any **one**) 3  
 (1) Write down about Peptidoglycan biosynthesis.  
 (2) Anaerobic respiration in prokaryotes.
- (d) Write a note on : (any **one**) 5  
 (1) Explain : Photosynthesis in bacteria.  
 (2) ETC : Write down its importance and process.
- 4** (a) Objective: 4  
 (1) Give examples of Iron bacteria.  
 (2) Define : Chemoautotrophs.  
 (3) Define : Halobacteria with examples.  
 (4) Give names of sulphur oxidizers.
- (b) Answer in brief : (any **one**) 2  
 (1) Give difference between Archae and Eubacteria.  
 (2) Explain Hydrogen bacteria in brief.
- (c) Answer in detail : (any **one**) 3  
 (1) Write down about metabolism in methanogens.  
 (2) Explain Nitrifying bacteria.

- (d) Write a note on : (any **one**) 5
- (1) Explain fermentative patterns of gram negative Eubacteria.
  - (2) How carbohydrate fermentation occur in lactic acid bacteria.
- 5 (a) Objective : 4
- (1) What is the role of Phosphotransferase?
  - (2) Give example of secondary messenger for signal transduction.
  - (3) What is G protein ?
  - (4) What is Symport type of transport ?
- (b) Answer in brief : (any **one**) 2
- (1) Explain Facilitated diffusion.
  - (2) Chemiosmotic driven transport.
- (c) Answer in detail : (any **one**) 3
- (1) Explain : Active transport.
  - (2) Discuss Quorum Sensing.
- (d) Write a note on : (any **one**) 5
- (1) Discuss signal transduction.
  - (2) Explain in detail fluid Mosaic model of cell membrane.
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