



**DBK-003-2015010**

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

**Third Year B. Sc. (Microbiology ) (Sem. V)  
(CBCS) Examination**

**June - 2022**

**MB-502 : Bacterial Metabolism  
(New Course)**

**Faculty Code : 003**

**Subject Code : 2015010**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- 1 (a) Objective : 4
- (1) What is  $V_{max}$  ?
  - (2) Define: Bioenergetics.
  - (3) Give importance of M M equation.
  - (4) State first law of thermodynamics.
- (b) Answer in brief : 2  
What is entropy & enthalpy ?
- (c) Answer in detail : 3  
Explain the concept of free energy.
- (d) Write a note on : 5  
Derive Michaelis - Menton equation.
- 2 (a) Objective : 4
- (1) Define :  $\Delta G$
  - (2) Lower  $K_m$  value of an enzyme indicates \_\_\_\_\_.
  - (3) Full form: ATP, CTP
  - (4) State Second law of thermodynamics.
- (b) Answer in brief : 2  
What is allosteric enzyme ?
- (c) Answer in detail : 3  
What is the role of reducing power in metabolism ?
- (d) Write a note on : 5  
What is regulatory enzyme ? Explain conformational changes in regulatory enzyme.

- 3 (a) Objective : 4
- (1) Where  $\beta$ -oxidation takes place in the prokaryotic cell ?
  - (2) At which step substrate level phosphorylation occur in the TCA cycle ?
  - (3) Importance of Pentose phosphate pathway.
  - (4) The end product of glycolysis is pyruvate which enters the Citric acid cycle after being converted to \_\_\_\_\_.
- (b) Answer in brief : 2  
Explain : Deamination
- (c) Answer in detail : 3  
Regulation of Glycolysis.
- (d) Write a note on : 5  
Explain :  $\beta$ -Oxidation.
- 4 (a) Objective : 4
- (1) Pyruvate converted into lactate under \_\_\_\_\_ condition.
  - (2) How many number of ATP are generated by complete oxidation of palmitic acid ?
  - (3) Where TCA Cycle occur in the cell ?
  - (4) Importance of gluconeogenesis.
- (b) Answer in brief : 2  
Write down importance of Glyoxylate cycle.
- (c) Answer in detail : 3  
Stickland reaction.
- (d) Write a note on : 5  
Explain: TCA cycle & its significance.
- 5 (a) Objective : 4
- (1) In an electron transport chain in terminal oxidation the cytochrome which donates electrons to O<sub>2</sub> is \_\_\_\_\_.
  - (2) In bacteria photosynthesis, the hydrogen donor is \_\_\_\_\_
  - (3) Name the glycans, present in peptidoglycan structure.
  - (4) What is Proton motive force ?

- (b) Answer in brief : 2  
 Draw a labeled diagram of ATP synthase.
- (c) Answer in detail 3  
 Write down about Peptidoglycan biosynthesis.
- (d) Write a note on : 5  
 Explain: Photosynthesis in bacteria.
- 6** (a) Objective : 4  
 (1) What is PSI ?  
 (2) Full form: ETC  
 (3) Where oxidative phosphorylation, occur in the cell ?  
 (4) Give name of end product of non cyclic photophosphorylation ?
- (b) Answer in brief : 2  
 Define: Oxidative phosphorylation.
- (c) Answer in detail : 3  
 Explain: Components of ETC in bacteria.
- (d) Write a note on : 5  
 Write a note on: Anaerobic respiration.
- 7** (a) Objective : 4  
 (1) Give examples of Iron bacteria.  
 (2) Define: Chemoautotrophs.  
 (3) Give examples of hydrogen bacteria.  
 (4) Define: Halobacteria.
- (b) Answer in brief : 2  
 What are Nitrifying bacteria ? Give examples.
- (c) Answer in detail : 3  
 Explain Photophosphorylation in Halobacteria.
- (d) Write a note on : 5  
 Explain fermentative patterns of gram negative eubacteria.

- 8 (a) Objective : 4  
 (1) Give examples of sulphur oxidizing bacteria.  
 (2) Give example of methanogens.  
 (3) Define: Lithotrophs.  
 (4) Difference between gram positive & gram negative bacteria.
- (b) Answer in brief : 2  
 Give characteristics and examples of Hydrogen bacteria.
- (c) Answer in detail : 3  
 Write down about metabolism in methanogenes.
- (d) Write a note on : 5  
 Explain carbohydrate fermentation in lactic acid bacteria.
- 9 (a) Objective : 4  
 (1) Define: Facilitated Diffusion.  
 (2) Give example of secondary messenger for signal transduction.  
 (3) What is the role of Phosphotransferase?  
 (4) What is Symport type of transport ?
- (b) Answer in brief : 2  
 What is G-Protein?
- (c) Answer in detail : 3  
 Explain: Active transport.
- (d) Write a note on : 5  
 Discuss Signal transduction.
- 10 (a) Objective : 4  
 (1) Importance of G protein.  
 (2) Define: active transport.  
 (3) Give one example of passive transport.  
 (4) What is antiport transport ?
- (b) Answer in brief 2  
 Draw labeled diagram of Singer -Nicolson model of plasma membrane.
- (c) Answer in detail : 3  
 Discuss Quorum Sensing.
- (d) Write a note on : 5  
 Explain in detail Mechanosensitive channels.