Seat No. : _____

# JH-113

**January-2021**

**B.Sc., Sem.-V**

**CC-302 : Microbiology**

**(Bacterial Metabolism)**

**(New Syllabus)**

**Time : 2 Hours]** **[Max. Marks : 50**

**Instructions :** (1) Students should write the answers from the question paper applicable to them; either **"NEW COURSE"** or **"OLD COURSE"** and it must be mentioned at the beginning of the answer paper.

(2) Answer any **three (3)** questions out of **eight (8)** questions. Question No. **9** is compulsory.

(3) Draw figures wherever necessary.

(4) Figures to the right indicate marks.

1. Describe the various methods used for studying biosynthesis. **14**

2. (A) Write a note on : Allosteric regulation. **7**
   (B) Derive Lineweaver-Burk equation and give its significance. **7**

3. Describe TCA cycle and give its anabolic role. **14**

4. (A) Give an overview of fermentations. **7**
   (B) Describe EMP pathway. **7**

5. Describe cyclic and non-cyclic photophosphorylation. **14**

6. (A) Write a note on anoxygenic phototrophs. **7**
   (B) Write a note on : Nitrifying bacteria. **7**

7. Describe the CB cycle. **14**

8. (A) Describe biosynthesis of fatty acids. **7**
   (B) Describe Glyoxylate cycle. **7**

9. Give short and specific answers in **1-2** lines only (any **eight**). **8**

(1) What is Km ?

(2) What is a non-competitive inhibitor ?

(3) What is covalent modification ?

(4) What is the role of NADPH ?

(5) Give an example of transketolase reaction.

(6) Name the organism carrying out butanediol fermentation.

(7) Name two organisms having ED as the glycolytic pathway.

(8) Name the unique precursors of PP pathway.

(9) Give example of iron oxidizing bacteria.

(10) Give two metabolic characteristics of *Thiobacillus thioxidans*.

(11) What are antenna pigments ?

(12) How do halobacteria carry out photophosphorylation ?

(13) What is the role of anaplerotic reactions ?

(14) Name the enzymes essential for gluconeogenesis.

(15) What is the role of bactoprenol ?

(16) Give the reaction(s) for the assimilation of ammonia into glutamate.

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1. Describe Feedback inhibition and types. **14**

2. (A) Write a note on : Fermentation **7**
   (B) Explain Allosteric regulation **7**

3. Enlist glycolytic pathways. Describe anyone and its significance. **14**

4. (A) Explain Stick land reaction. **7**
   (B) Describe Glyoxylate bypass and its significance. **7**

5. Describe physiological groups of phototrophs. **14**

6. (A) Write a note on : Photophosphorylation in halobacteria. **7**
   (B) Write a note on : Sulfur oxidizing bacteria. **7**

7. Describe assimilation of ammonia and molecular nitrogen. **14**

8. (A) Describe biosynthesis peptidoglycan. **7**
   (B) Describe use of biochemical mutants in studying biosynthesis. **7**

9. Give short and specific answers in **1-2** lines only (any **eight**).

(1) Give a reaction to explain substrate-level phosphorylation.

(2) Give an example of zymogen activation.

(3) Name the components of ETC.

(4) What is the redox potential ?

(5) Give an example of transaldolase reaction.

(6) Given an example of decarboxylation of amino acid.

(7) Give the products of KDPG aldolase.

(8) Name the end product(s) of beta-oxidation of fatty acids.

(9) Give an example of purple sulfur bacterium.

(10) What are carboxysomes ?

(11) Name the organism synthesizing purple membrane.

(12) Name the three phases of Calvin cycle.

(13) What is the role of ACP ?

(14) Give two examples of unsaturated fatty acids.

(15) What is nitrate assimilation ?

(16) Name the precursor metabolites used for biosynthesis of nucleotides.