

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 K_m ?
 - (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 thiooxidans*.
 - (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**).

8

- (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) Give 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.
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