Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27
M.SC. MICROBIOLOGY - II SEMESTER
SEMESTER EXAMINATION: APRIL 2022
(Examination conducted in July 2022)
MB 8118 – MICROBIAL PHYSIOLOGY

Time- 2 ½ hrs Max Marks-70

This question paper contains **2** printed pages and **4** parts

I. Answer any Five of the following **5x3=15**

1. Classify microorganisms based on carbohydrate consumption with suitable examples.
2. Summarize the first and second laws of thermodynamics.
3. Draw the structure of any one nucleotide that is seen in RNA.
4. How polysaccharides like starch are assimilated by microorganisms?
5. Differentiate oxidative phosphorylation with that of substrate level phosphorylation.
6. What is nucleotide salvage pathway? Write two sentences about its significance. .
7. Define active site, allostery and isozyme.

II. Answer any Five of the following **5x5=25**

8. Describe group translocation in terms of its distinctive characteristics.
9. How are amino acids classified? Give suitable examples under each group.
10. What types of interactions hold the tertiary structures of proteins together? What physical or chemical factors affect the conformation of proteins?
11. Briefly discuss the ways in which microorganisms degrade and use common disaccharides, and polysaccharides.
12. What by-products of fatty acid catabolism enter glycolytic pathway, TCA cycle and Electron transport chain? Give an account.
13. Briefly describe mixed acid fermentation.
14. What are competitive and non-competitive inhibitors, and how do they inhibit enzymes?

III. Answer any Two of the following **2X10=20**

15. a. How do bacteria respond to nutrient stress? **5**
    b. What is amino acid catabolism? Write its significance. **5**

16. Identify those reactions of the Embden-Meyerhof and Pentose Phosphate Pathways that consume ATP and produce ATP and NAD(P)H.

17. a. What is the purpose of enzyme kinetics? What are the factors that affect enzyme activity? **5**
    b. What is photophosphorylation? What is the difference between cyclic and noncyclic photophosphorylation **5**

IV. Answer the following **1X10=10**

18. a. Following are the by-products produced by the bacteria during their growth when inoculated in media with precursors towards the synthesis of end products.
    a. Phosphoenolpyruvate, b. 2-keto-3-deoxy-6-phosphogluconate (KDPG), c. Fumarate, d. Acetoin, e. Acetaldehyde and f. Butyraldehyde.

    Write down the pathways in which each of the by-product is produced. 6

    b. Most enzymes do not operate at their biochemical optima inside cells. Suggest why this is the case? **4**