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 8121 – 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 organisms based on their nutritional requirement.
2. Define free energy. What are exergonic and endergonic reactions?
3. What is aspartame? Which amino acids are present in aspartame?
4. How polysaccharides like starch are assimilated by microorganisms?
5. What bonds are seen in double stranded DNA? What enzymes affect the same?
6. Define Km, Vmax and Kcat.
7. What is allostery? What is the significance of allostery in relationship with enzyme studies?

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

8. Describe facilitated diffusion and primary active transport in terms of their distinctive characteristics..
9. Describe the four levels of protein structure.
10. Briefly discuss how are amino acids catabolised?
11. Why are fatty acids a rich source of energy even though no ATP is generated when they are degraded by the β-oxidation pathway?
12. What chemical intermediate link pyruvate to the alcohol fermentation and TCA? Explain.
13. Outline a way in which purines are degraded.
14. Differentiate between C3 and C4 pathways.

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

15. a. How do the organisms deals with the thermal stress? **5**
    b. Define substrate level phosphorylation. Describe it with any two examples. **5**

16. Describe in general terms what happens to a molecule of glucose during aerobic respiration.

17. a. How would you determine enzyme activity? **7**
    b. How does the Michaelis constant (Km) relate to enzyme function? **3**

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

18. a. A facultative aerobic bacteria when inoculated in the nutrient rich medium and incubated in anaerobic condition initially showed some oxidation of glucose to by-products of citric acid cycle. After few hours when checked, there was reduction in TCA cycle by-products and increase in certain acidic and neutral end products. Comment on the statement as to why were these changes observed? **6**

b. What would happen if a microorganism that is depended on the carbohydrates, (Disaccharides or polysaccharides) no longer produce the enzymes required for their breakdown to monosaccharide? Could this defect be corrected by other nutrients other than carbohydrates in the media? If so, which nutrients? **4**