QP Code: U25C066

Reg. No : ....
Name : ....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

III SEMESTER (FYUGP) DEGREE EXAMINATIONS, OCTOBER 2025
B. Sc. Microbiology
MBY3CJ 202 : MICROBIAL METABOLISM
2024 Admission Onwards
(Credits: 4)

Time: 2 Hours **Maximum Marks: 70**

Section A

*Answer **all**. Each question carries **3** Marks.* ***(Ceiling: 24 Marks)***

1. What is electroneutral transport?
2. List the key stages of aerobic respiration in the correct order. What is the net ATP yield from one molecule of glucose during this process?
3. What is the main difference in end products between homofermentative and heterofermentative lactic acid bacteria?
4. What is a linear fermentation pathway?
5. Compare and contrast porins and permeases with examples.
6. How do hydrogenase enzyme contribute to energy generation in chemolithotrophs?
7. How do green sulphur bacteria contribute to sulphur cycle?
8. Explain why fermentation yields a limited amount of energy compared to respiration.
9. Compare and contrast chemolithoautotrophs and chemolithoheterotrophs.
10. Justify why an antimicrobial drug that specifically targets bacterial Complex I would more effective than one that targets ATP synthase.

Section B

*Answer **all**. Each question carries **6** Marks.* ***(Ceiling: 36 Marks)***

11. Discuss the primary difference in the photosynthesis of purple bacteria and cyanobacteria.
12. Explain the key difference between the EMP pathway and the ED pathway.
13. How does homolactic fermentation differ from heterolactic fermentation?
14. Distinguish between the photosynthetic pigments according to their efficiency in absorbing different wavelengths of light.

Turn Over

15. Explain how various macronutrients impact microbial growth and metabolism, with examples.
16. Categorize the major nutritional groups of microorganisms based on their sources of nutrition.
17. Evaluate the Electron Transport Chain (ETC) in a bacterium.
18. Analyze the ATP yield under aerobic and anaerobic metabolism to explain the efficiency difference between the two processes.

Section C

*Answer **any one**. Each question carries **10** Marks.* ***(1x10=10marks)***

19. Detail the different groups of phototrophic microorganisms with examples.
20. Analyze the different uptake mechanisms for glycerol in microbial cells.

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