

Register Number:

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ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27

B.Sc. MICROBIOLOGY - III SEMESTER

SEMESTER EXAMINATION: OCTOBER 2021

(Examination conducted in March 2022)

**MB 318 – Microbial Physiology, Growth and Control of Microorganisms**

**Time: 2 1/2 hours Max Marks: 70**

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

1. **Answer any Five of the following 5X3=15**

1. List the different nutritional types of microorganisms.

2. Define the following:

i. Defined media ii. Complex media iii. Differential media

3. Explain substrate-level phosphorylation with an example.

4. Why is ATP called the energy currency of the cell?

5. Classify bacteria based on their oxygen requirement.

6. Name the enzyme that:

a. Catalyzes the phosphorylation of glucose to glucose-6-phosphate.

b. Catalyzes the conversion of 3-phosphoglycerate to 2-phosphoglycerate.

c. Oxidizes isocitrate to α-ketoglutarate and CO2.

7. List the different enzymes and coenzymes of the pyruvate dehydrogenase complex.

1. **Answer any Five of the following 5X5=25**

8. Differentiate between prokaryotic and eukaryotic electron transport chains.

9. Discuss one method for determining the effectiveness of chemotherapeutic agents.

10. Differentiate between batch and continuous culture.

11. Explain how NAD+ undergoes reversible reduction to NADH.

12. What are pure cultures? How are streak plates prepared?

13. Describe any two methods for measurement of cell mass?

14. Describe the β-oxidation pathway of palmitic acid.

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

15 a. Explain the pathway of glycogen breakdown. 6

b. Differentiate between cyclic and non-cyclic photosynthesis. 4

16. Discuss the different phases of the bacterial growth curve.

17 a. Mention the mode of action of the following antibiotics:

i. Cephalosporins ii. Tetracyclines iii. Polymyxin iv. Nystatin. 4

b. Which reactions of gluconeogenesis bypass the irreversible reactions of glycolysis. 6

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

18 a. You procured a pure bacterial culture from the American Type Culture Collection. List a few

ways of preserving this culture for future use. Explain one of the preservation techniques. 6

b. *Escherichia coli* grows at 37oC, while *Thermus aquaticus* grows at 110oC. However, *E. coli* doesn’t grow at 110 oC and *T. aquaticus* don’t grow at 37oC. What prevents the growth of each organism at the non-permissive temperature? 4