Register Number:
Date:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU -27
B.Sc. MICROBIOLOGY – III SEMESTER
SEMESTER EXAMINATION – OCTOBER 2019
MB 318: MICROBIAL PHYSIOLOGY, GROWTH AND CONTROL OF MICROORGANISMS

Time: 2 ½ hours **Max. Marks: 70**

This paper contains 2 printed pages and 4 parts

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

1. Classify microorganisms based on their carbon source. Give two examples of each.
2. Draw the microbial growth curve in a closed system.
3. Define substrate-level phosphorylation. Give an example.
4. How do the first steps of fatty-acid synthesis take place?
5. Draw the structure of NAD^+, $NADP^+$, and FAD. What structural feature do they have in common?
6. Does the net gain of ATP in glycolysis differ when glycogen, rather than glucose, is the starting material? If so, what is the change?
7. Write down the mode of action of the following antibiotics: i) Chloramphenicol, ii) Amphotericin B

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

8. Explain two methods used for determination of microbial cell mass.
9. a. Why exponential phase cultures are used in biochemical and physiological studies? 2
   b. Differentiate between synthetic and complex media. 3
10. What are the purposes of carrying out the streak plate and pour plate techniques in microbiology?
11. Explain how energy released by exergonic reactions is use to provide energy for endergonic reactions?
12. What are the oxidative reactions of the pentose phosphate pathway?
13. Where does carbon dioxide fixation take place? Explain the Calvin cycle
14. Where does the citric acid cycle take place in the cell? What are the similarities and

differences between the reactions catalyzed by pyruvate dehydrogenase and α-ketoglutarate dehydrogenase?

III. Answer any Two of the following 2x10=20

15. Explain the different mechanisms by which bacteria become resistance to antibiotics.

16. a. How does a continuous culture system differs from a batch culture? 4
    b. Describe how the two different kinds of continuous culture systems operate. 6

17. a. How is nitrogen from the atmosphere incorporated into biologically useful compounds? 6
    b. Summarize the steps in the electron transport chain from NADH to oxygen. 4

IV. Answer the following 1x10=10

18. a. You have preserved a pure culture of bacteria in glycerol. After several month, when you are trying to revive it from the glycerol stock, you are not able to get the same bacteria. Why? 5

    b. Your exam is scheduled next week and you cannot afford to get sick. So you went to the pharmacy and brought few antibiotics. Based on what you have learned from the text, are there any risks in taking the antibiotics. Discuss.
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