



**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 1/2 hrs

Max. Marks : 70

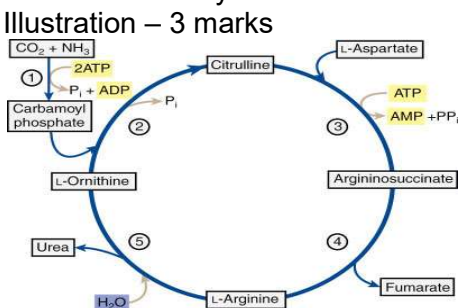
This paper contains 2 printed pages and 4 parts

**SCHEME OF EVALUATION**

**I. Answer any Five of the following**

**5x3=15**

1. Classify microorganisms based on their nutrition uptake.  
Nutritional classification – 3 marks
2. When bacterial cultures are shifted from 37°C to 4°C, growth ceases. Give reasons.  
Explanation – 3 marks
3. Define pure culture. Why are cultures maintained in their pure form in microbiology labs?  
Definition – 1 mark, Reasoning – 2 marks
4. Give historical perspective of antibiotic discovery.  
Description – 3 marks
5. Write a short note on homolactic acid fermentation.  
Homo lactic acid fermentation – 3 marks
6. What are energy rich compounds and why are they called so?  
List – 1 marks and reasoning – 2 marks
7. Illustrate Urea Cycle.  
Illustration – 3 marks

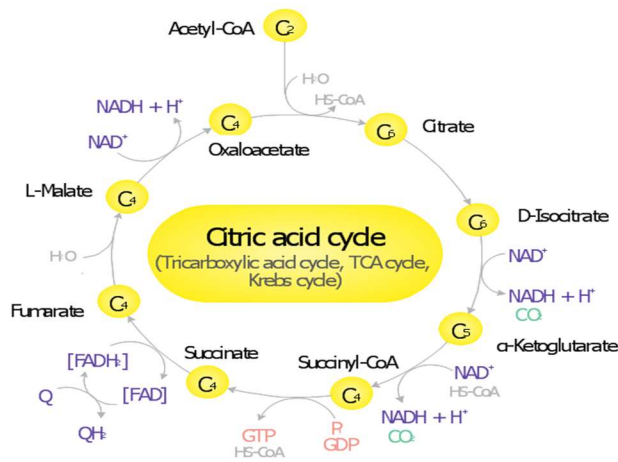


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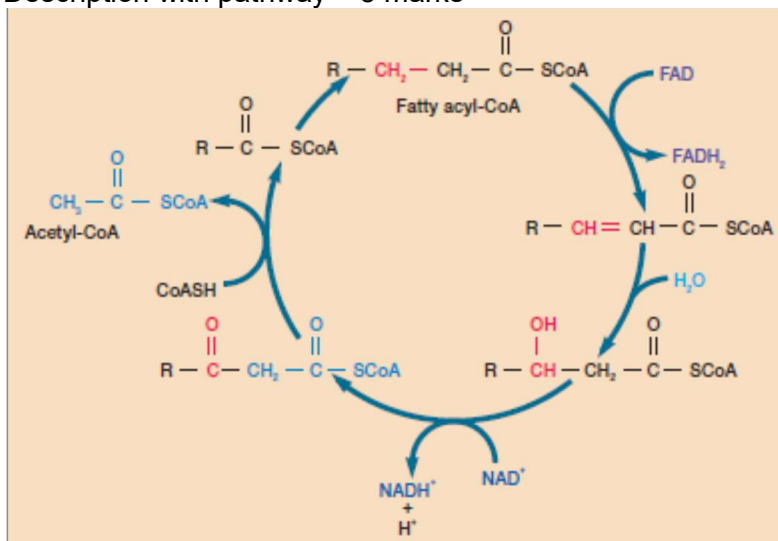
**II. Answer any Five of the following**

**5x5=25**

8. Give a comparative account on Chemostat and Turbidostat.  
Comparative account – 5 marks
9. How can synchrony of microbial cells be attained? Write a note on applications of synchronous culture.  
Description of any one technique – 3 marks and applications – 2 marks
10. Differentiate selective media with differential media with suitable examples.  
Differences – 2.5x2=5 marks
11. Describe enzymatic breakdown of starch and lactose.  
Starch and Lactose breakdown flow chart with enzymes -2.5x2=5 marks
12. Write the significance of TCA cycle. Illustrate the steps involved.  
Significance – 1 mark and illustration – 4 marks



13. Write notes on  $\beta$ -oxidation pathway.  
Description with pathway – 5 marks



14. Describe peptidoglycan biosynthesis.  
Process with suitable diagram – 5marks

**III. Answer any Two of the following**

**2X10=20**

15. What is the fate of pyruvate under anaerobic condition?  
Alcoholic and acid fermentation pathways.
16. a. What are the important target sites in a bacterial cell for antibiotics? 5 marks  
Target sites – 5 marks  
b. How do bacteria resist antibiotics? 5 marks  
Mode of resistance – 5 marks
17. a. Describe one direct and indirect method of enumerating bacterial number from samples. 5 marks  
2x2.5=5 marks  
b. Explain cyclic photosynthesis 5 marks

Description with diagram

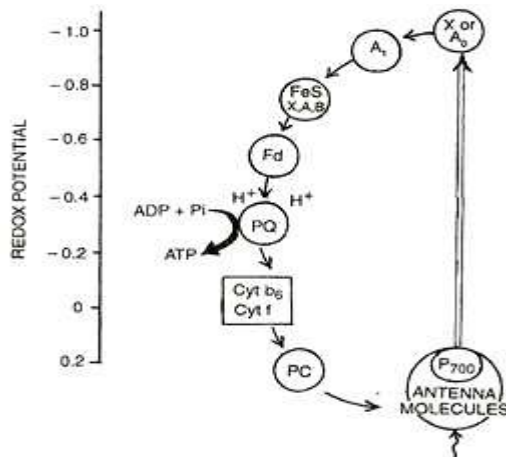


Fig. 13.17. Cyclic photophosphorylation.

**IV. Answer the following**

**1X10=10**

18. a. Why is O<sub>2</sub> toxic to anaerobes and how do they protect themselves in their presence? 3 marks

Reasoning - Role of peroxidases and catalases – 3 marks

- b. Calculate the ATP yield in prokaryotes for glycolysis 3 marks  
Calculation of ATP yield in prokaryotes for glycolysis:at stages – 3 marks

- c. A patient suffering from fungal skin infection when treated with topical gels with antibiotics Penicillin and Streptomycin found insensitive towards the antibiotics. Give reasons. Which antibiotics will be ideal in this case to treat fungal infection and why?

Reasoning – 4 marks

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