

U.G. 5th Semester Examination-2020**Molecular Biology & Biotechnology****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : MBBT-DSE-T-506****(Microbial Physiology)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** of the following: $2 \times 5 = 10$
- How does temperature affect microbial growth?
 - Why carotenoids are important in photosynthesis?
 - What is reductive TCA cycle?
 - What are the differences between chemostat and turbidostat?
 - Define Facultative aerobic bacteria with an example.
 - Define specific growth rate. State its unit.
 - What are mixotrophic bacteria? Give an example.

- h) How lowering of water activity can inhibit microbial growth?

2. Answer any **two** of the following: $5 \times 2 = 10$
- What is electrogenic and electroneutral membrane transport? Give an example of each. What is oxygenic and anoxygenic photosynthesis? $2+2+1=5$
 - Delineate the phases of microbial growth curve in a closed system.
 - Mention with example five classes of microorganisms categorized on their temperature ranges of growth.
 - Describe phosphoenolpyruvate: sugar phosphotransferase system and its function.
3. Answer any **two** of the following: $10 \times 2 = 20$
- Why *Escherichia coli* shows two exponential growth phases on a mixture of glucose and lactose. What are siderophores? How they help in iron transport in microbes? Name one siderophore and state its use. Distinguish between batch and continuous culture. $2+1+3+2+2=10$
 - What do you mean by viable cell count? Discuss plate count methods with serial dilution. What is CFU? Mention different classes of

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microorganisms according to their pH requirement for growth. $1+5+1+3=10$

c) Name the major nutritional types of microorganisms based on:

i) carbon sources

ii) energy sources

iii) electron sources

Describe any one category. $6+4=10$

d) State the major differences between cyclic and non-cyclic photophosphorylation. Write a short note on methanogens. Define with example: Symport, Uniport, Antiport. $4+3+3=10$
