

U.G. 5th Semester Examination-2021**Molecular Biology & Biotechnology****[HONOURS]****Discipline Specific Elective (DSE)****Course Code : MBBT-DSE-T-506****(Microbial Physiology)**

Full Marks : 40

Time : 2½ 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: $2 \times 5 = 10$
- a) Define diauxic growth with an example.
 - b) What are absorption and action spectrum of photosynthesis?
 - c) Give an example each of oxygenic and anoxygenic photosynthetic bacteria.
 - d) What is balanced growth and unbalanced growth?
 - e) Define mixotrophy with an example.
 - f) Define group translocation with an example.
 - g) Name two enzymes of reductive TCA cycle.
 - h) Distinguish between batch and continuous culture.

[Turn Over]

2. Answer any **two** of the following: $5 \times 2 = 10$
- a) What are barotolerant and barophilic bacteria? How do ionizing radiation and ultraviolet radiation harm microorganisms? How do microorganisms protect themselves against damage from UV light? $2+2+1=5$
 - b) Briefly describe microbial chemolithotrophic metabolism.
 - c) Define with example, five classes of microorganisms categorized on the basis of range of growth temperatures.
 - d) What are Carboxysomes? Name two enzymes of Calvin cycle and mention the reactions catalyzed by them. $1+2+2=5$
3. Answer any **two** of the following: $10 \times 2 = 20$
- a) Compare cyclic and noncyclic photophosphorylation. Define with diagram and give example each of primary active and secondary active transport. Draw the Z scheme of electron flow during photosynthesis in cyanobacteria. $3+4+3=10$
 - b) Briefly describe the different techniques to determine microbial growth. State their advantages and disadvantages. 10

c) Classify microorganisms based on pH ranges, solutes and water activity and oxygen concentration. $3+2+5=10$

d) Discuss different pathways of iron transport in microbes. What is electrogenic and electroneutral membrane transport?

$$8+2=10$$
