

2021

MICROBIOLOGY — HONOURS

Paper : CC-6

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any three** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) Define generation time and mean growth rate constant.
 - (b) When does microbial population enter stationary phase?
 - (c) Distinguish between active transport and passive diffusion.
 - (d) Which group of prokaryotes has true chlorophyll? What kind of photosynthesis they perform?
 - (e) Write down the components of complex III.
 - (f) Define the terms : Barophilic and Thermophilic.
 - (g) Give one example of each for antiport and symport system.
 - (h) What is chemolithotrophic autotrophy?
 - (i) What is an uncoupler? Give example.
 - (j) What is oxidative phosphorylation?
 - (k) What is assimilatory nitrate reduction?
 - (l) Write down the significance of PPP pathway.
 - (m) What is leg haemoglobin?
 - (n) What do you mean by Pasteur Effect?
 - (o) What is P/O ratio?
2. (a) Why a lag phase is needed, before an exponential phase, after inoculation?
- (b) Briefly describe a method of measuring bacterial growth.
- (c) What are halophiles and why does *Halobacterium* require sodium and potassium?
- (d) How siderophores are involved in iron transport? 2+3+(1+2)+2

Please Turn Over

3. (a) Write down the CO₂ generating steps of TCA cycle.
(b) Write down the reaction that is catalyzed by the enzyme glucose-6-phosphate dehydrogenase.
(c) What are the differences between linear and branched fermentation pathways?
(d) What is galactosemia? 3+2+3+2
4. (a) How is nitrogenase synthesis and activity controlled by NH₃ and CO₂?
(b) Which biochemical reactions might be affected by vit B1 deficiency?
(c) Discuss briefly about methanogenesis.
(d) What is the significance of ED pathway in bacteria? 3+3+3+1
5. Justify the following statements : 2½×4
(a) All photosynthetic bacteria do not produce oxygen.
(b) Rotenone inhibits ETC partially but cyanide inhibits it completely.
(c) Some bacteria generate ATP instead of lacking PFK-1.
(d) TCA is amphibolic in nature.
6. Write brief notes on **any four** of the following : 2½×4
(a) Hydrogen Oxidation
(b) Anoxygenic photosynthesis
(c) Different nutritional mode of bacteria based on their source of carbon and energy
(d) Chemiosmotic hypothesis
(e) F₀-F₁ ATP Synthase.
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