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 Thermoduric.

(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

3. (a) Write down the CO_2 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 NH_3 and CO_2?

(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) F_0-F_1 ATP Synthase.