

2022

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) Why oxygen inhibits the fermentation process?
- (b) What is symport? Give an example.
- (c) What is meant by symbiosome?
- (d) Name an inhibitor of $\text{Na}^+\text{K}^+\text{ATPase}$ and mention its medical use.
- (e) What is the difference between ED Pathway and glycolysis?
- (f) Distinguish between continuous culture and synchronous culture.
- (g) What are siderophores? Why they are important?
- (h) What is photophosphorylation?
- (i) Name two hydrogen oxidizing bacteria.
- (j) What is assimilatory nitrate reduction?
- (k) What is psychrophiles? Give example.
- (l) What is heterolactic fermentation?
- (m) What are bacteroids?
- (n) What are xerophiles?
- (o) What enzyme do most obligate anaerobes lack?

2. (a) What are the four stages of a bacterial growth curve? Which phase shows maximum growth rate? Describe the phase briefly.
- (b) Explain the diauxic growth of *E.coli* in presence of both glucose and lactose in the medium.
- (c) What are the factors that affects bacterial growth?
- (d) What is synchronous growth?

(1+1+2)+2+2½+1½

Please Turn Over

3. (a) Write down the reactions that occur in pyruvate dehydrogenase complex.
(b) Write down the ATP/GTP generating step in TCA cycle.
(c) Name the two three carbon molecules that are generated from cleavage of fructose-1, 6-bisphosphate.
(d) Why pentose phosphate pathway is called a shunt? What are the two main functions of this pathway? 2+2+2+(2+2)
4. (a) Distinguish among active transport, passive diffusion and facilitated diffusion.
(b) Which type of transport protein is involved in facilitated diffusion, uniporters and co-transporters?
(c) What is group translocation? What is its importance in microbial metabolism? 3+3+(2+2)
5. (a) What is dissimilatory N₂ reduction?
(b) How does substrate level phosphorylation differ from oxidative phosphorylation?
(c) Are electron transport and oxidative phosphorylation same process? Why or why not?
(d) What are chemolithotrophs? Mention different types of chemolithotrophy in bacteria. 2+3+2+3
6. Write brief notes on **any four** of the following : 2½×4
- (a) Oxygenic photosynthesis
(b) Nitrogenase enzyme
(c) Alcohol fermentation
(d) Effect of dinitrophenol and cyanide on electron transport chain
(e) Regulatory reactions of glycolysis.
-