

2018
MICROBIOLOGY—HONOURS

Third Paper

(Group – B)

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 applicable.*

Answer Question No.1 and any four from the rest.

1. (a) Define multi enzyme complex. Give an example. 2×5
 (b) What is the importance of glyoxalate cycle in plants?
 (c) What is the difference between biocatalyst and chemical catalyst?
 (d) Draw the structure of carnitine and indicate the group where the fatty acyl moiety is added.
 (e) Glutamate plays a central role in nitrogen metabolism. Briefly explain.
2. (a) What do you mean by specific activity of an enzyme? What is its significance? 2
 (b) Draw Lineweaver-Burk plots for competitive, non-competitive and un-competitive inhibition. 6
 (c) What do you mean by suicide inhibition of an enzyme? 2
3. (a) How do you differentiate Michaelis-Menten and Sigmoidal kinetics? 4
 (b) What is temperature coefficient of an enzyme? 2
 (c) Define katal and turnover number. 4
4. (a) Name a 'non-standard' amino acid. How lysine is metabolized by microbes? What is the importance of the redoxine? 1+2+2
 (b) How glycine catabolism leads to the formation of kidney stones? 2
 (c) What is Kreb's bicycle? Why is it so called? 1+2
5. (a) Name the microorganisms that use carbon dioxide as electron acceptor. What are the products? 2+2
 (b) How ETC and oxidative phosphorylation are coupled in cell? What happens when (i) Robnone and (ii) Antimycin are added separately to a cell? 2+2+2

Please Turn Over

6. (a) Use a diagram to show the entry of fatty acyl-CoA from cytosol to mitochondrial matrix. 5
(b) Explain the importance of folic acid in metabolism. 3
(c) What is the antiporter involved in mitochondrial fatty acid oxidation? What are the molecules that it transports? 2
7. (a) Explain the Glucose-alanine cycle. 4
(b) Write down the chemical equations of deamination and transamination with enzymes and coenzymes. What are the functions of transamination? 4+2
8. (a) What is the difference between gluconeogenesis and glycogenesis? 4
(b) Outline the irreversible steps of glycolysis. (Mention equations with only names of reactants, products, enzyme and cofactors, if any. Chemical structures and other details are not required.) 3
(c) Role of phosphofructokinase in the regulation of glycolysis. 3
9. (a) NADPH deficiency provides resistance to malaria – explain. 4
(b) What is the significance of the triose phosphate isomerase? 3
(c) Explain the difference between substrate level phosphorylation and oxidative phosphorylation. 3
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