

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, MAY 2019

FIRST YEAR [BATCH 2018-21]

MICROBIOLOGY (General)

Date : 27/05/2019

Time : 11 am – 1 pm

Paper : II

Full Marks : 50

(Use a separate Answer Book for each group)

Group-A

Answer **any three** questions of the following:

[3×10]

1. a) What are epimers? Give examples. 2
b) What is mutarotation? What information can be obtained from it? 2+1
c) Write down the differences between alpha helix and beta pleated sheet with respect to the structure of a protein. 2
d) What is glycolipid? 2
e) Name one essential amino acid. 1
2. a) What is T.C.A. cycle? Where does it occur in a cell? Why is it called an amphibolic cycle? 2+1+2
b) Write down the differences between substrate level phosphorylation and oxidative phosphorylation. 2½
c) What happens when pyruvic acid is metabolized under anaerobic condition? 2½
3. a) Write down the following conversions by mentioning the name of enzymes, coenzymes and cofactors (if any) involved in the reaction. 4×2
(i) 3-phosphoglycerate to Phosphoenolpyruvate
(ii) Succinyl CoA to Malate
(iii) 1,3-Bisphosphoglycerate to Phosphoenolpyruvate
(iv) 6-phosphogluconate to sedoheptulose 7-Phosphate
b) Write down the significance of Pentose phosphate pathway. 2
4. a) What is the difference between lytic and lysogenic cycle of Lambda phage? 3
b) Classify the virus according to its capsid symmetry. Give examples. 3
c) Name two DNA viruses which can infect animals. 2
d) Define the term: i) Virion ii) Capsid 1+1
5. a) Define specific activity of an enzyme. 1
b) Write the Michaelis-Menten equation. What is the significance of K_m . 2+2
c) "During enzyme activity determination, substrate concentration is taken higher than the enzyme concentration." Explain. 3
d) What is 'suicide inhibition'? Explain with example. 2
6. a) Mention important differences between competitive, Uncompetitive and non-competitive inhibition. 4
b) What are 'apoenzyme' and 'holoenzyme'? 1½+1½
c) What is Ribozyme? 2
d) Write short note on allosteric enzyme. 1

Group-B

Answer **any two** questions of the following:

[2×10]

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| 7. | a) | Define 'thermal death time' and 'decimal reduction time'. | 1+1 |
| | b) | Why is moist heat considered more effective than dry heat for the destruction of microorganisms? | 2 |
| | c) | Define sterilization. Do you consider boiling water causes sterilization? Explain. | 1+2 |
| | d) | Why is ionizing radiation more effective than UV for reducing microbial burden in food products? | 3 |
| 8. | a) | What is chemoautotrophic nitrification process? | 2 |
| | b) | What is heterocyst? | 2 |
| | c) | Write down the structural components of nitrogenase enzyme. | 2 |
| | d) | How plant exudates play an important role on rizosphere microoranism? | 3 |
| | e) | What is leghemoglobin? | 1 |
| 9. | a) | What are the factors associated with the interaction of microbes in soil? | 3 |
| | b) | What do you mean by soil texture? How many soil textural classes exist? | 2+1 |
| | c) | How does neutralism differ from mutualism? | 4 |
| 10. | a) | What is podogenesis? how does podogenesis occur biologically? | 2+3 |
| | b) | Why is methyl alcohol not generally employed for destruction of microorganisms in laboratory? | 3 |
| | c) | What is 'Tyndallization'? | 2 |

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