

[This question paper contains 4 printed pages]

5856

Your Roll No

B Sc (Hons.)/I

J

MICROBIOLOGY – Paper II

(Biochemistry and Instrumentation)

(Admissions of 2004 & onwards)

Time 3 Hours

Maximum Marks 60

*(Write your Roll No on the top immediately
on receipt of this question paper)*

*Attempt five questions in all, selecting
at least two questions from each Section
Attempt Section A and Section B on separate
answer books All questions carry equal marks*

SECTION – A

1 Attempt the following

- (a) On what assumptions, is the Michaelis–Menton Kinetics of enzyme catalysis based ? (3)
- (b) What is hyperchromic shift ? Write its significance (3)
- (c) Biological systems follow laws of thermodynamics How ? Explain (3)

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- (d) Which amino acid has a higher isoelectric pH – an amino acid with pK values of 2.19 and 9.67 or an amino acid with pK values of 2.09 and 9.82. What is its significance? (3)
- 2 (a) Draw the structures of any 2 –
- (i) Peptidoglycan
 - (ii) Cerebroside
 - (iii) ATP
 - (iv) Sphingomyelin (3×2=6)
- (b) Name the following –
- (i) Lipid with an Ether linkage
 - (ii) Optically inactive sugar
 - (iii) Essential amino acid
 - (iv) Unsaturated fatty acid with '2' double bonds
 - (v) Non-standard nucleotide (N'base) present in tRNA
 - (vi) Reagent used for determination of 'N'-terminal of a polypeptide (1×6=6)
- 3 Differentiate between (any four) –
- (i) Epimers and Anomers
 - (ii) Fibrous and Globular Proteins
 - (iii) Multi enzyme Complex and Allosteric enzymes
 - (iv) Nucleoside and Nucleotides
 - (v) Simple and Complex lipids (3×4=12)

- 4 (a) What is the other name for double-reciprocal plot ?
What is its significance ? (3)
- (b) Why is DNA more stable than RNA ? (3)
- (c) What is a triphasic titration curve ? Which
compounds show it ? Give an example (3)
- (d) What is Ramachandran Plot ? Write its
significance (3)

SECTION - B

- 1 (a) Discuss the principle of Ion-Exchange
chromatography What are its applications ?
(2+2=4)
- (b) Describe the ultrastructure of a mitochondrion
Draw a well labelled diagram and comment on its
functions (4)
- (c) Define the following terms related to radioactivity
units
(i) Curie (ii) Specific activity (1×2=2)
- (d) Where in the cell are the following localized ?
Mention the precise location
(i) Cytochrome oxidase
(ii) Adenylate cyclase
(iii) Monoamine oxidase
(iv) Acid phosphatase (½×4=2)

- 2 (a) Comment on the asymmetry of biological membranes (3)
- (b) Explain the purpose of each of the following chemical reagents used in gel electrophoresis
- (i) N, N' - methylene-bis-acrylamide
 - (ii) TEMED
 - (iii) Coomassie Blue
 - (iv) Ethidium bromide ($\frac{1}{2} \times 4 = 2$)
- (c) What is the principle underlying isoelectric focussing? What are its applications? (3)
- (d) Why do the radioautographic techniques generally employ β -emitters? (2)
- (e) Comment on the functions of Golgi apparatus (2)
- 3 (a) What are the different types of lysosomes found in the cell? (3)
- (b) Define the following terms
- (i) Void volume
 - (ii) Mitoplast
 - (iii) Microsomes
 - (iv) Svedberg
 - (v) Fluor ($1 \times 5 = 5$)
- (c) Differentiate between the following pairs (any two) ($2 \times 2 = 4$)
- (i) Affinity & gel chromatography
 - (ii) Absorption and action spectrum
 - (iii) Prokaryotic and eukaryotic ribosomes