[3 hours] (100 marks)

N.B. (1) Attempt all questions.
(2) Draw labeled diagrams wherever necessary.

Q1.A. Define the following terms : (5)

i. Capsule,
ii. Magnetosomes,
iii. Mesosomes ,
iv. Pleomorphism,
v. Zwitterion

B. State whether the given statement is true or false: (5)

i. Cyanophycin granules are reserves of carbohydrates
ii. Bacteria can have numerous sex pili.
iii. Phosphatidylcholine is a phospholipid.
iv. The eukaryotic ribosomes are 80 S.
v. The ER is also a major site of cell membrane synthesis.

C. Give one example for each of the following (5)

i. Disaccharide
ii. Gram- negative Coccobacilli
iii. Ciliated eukaryote
iv. Basic amino acid
v. Storage Lipids

D. Select the correct alternative and rewrite the statements: (5)

i. The enrichment culture technology was discovered by----------
(Koch, Pasteur, Winogradsky)
ii. Abrupt, random changes in direction of bacterial movement are called ----------
(runs, twists, tumbles).
iii. The IS: 12035 is a ___ standard on "safety in laboratories ".(AGMARK, BIS, FDA)
iv. Alpha helix is a _____ structure of proteins.(primary, secondary, tertiary)
v. The N-β-glycosidic bond is found in a ____[peptide, nucleotide, disaccharide]

Q2. Answer briefly <u>any two</u> of the following: (20)

i. Write a short note on the structure and function of a prokaryotic cell membrane.
ii. Explain only diagrammatically the structure of eukaryotic Mitochondria and Golgi complex
iii. Discuss the role of proteins & carbohydrates in biological systems

Q3.A. Answer briefly <u>any three</u> of the following: (18)

i. Discuss the scope of Medical & Food Microbiology
ii. Describe Koch's postulates
iii. Explain with a suitable diagram the ultrastructure of a bacterial flagella
iv. Discuss in brief the structure and function of a prokaryotic nucleoid.
v. Discuss storage inclusions found in prokaryotes.
vi. Explain with the help of a suitable diagram the formation of endospore in a prokaryotic cell.

[Turn over]

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B. Do as directed: any two (2)

i. Give the contribution by Antony van Leeuwenhoek.
ii. Give the contribution by Louis Pasteur
iii. Give the contribution by John Tyndall
iv. Give the contribution by Joseph Lister

Q4.A. Answer briefly any three of the following (18)

i. Explain the structure of a eukaryotic nucleus.
ii. Discuss the structure and function of endoplasmic reticulum and ribosomes
iii. Discuss the basic ultrastructure of cilia & flagella.
iv. Describe how equipments and nature of work place would help adopt safety measures in a Microbiology Laboratory.
v. Discuss all the components that constitute the eukaryotic cytoskeleton.
vi. Discuss the hazardous procedures undertaken in a Microbiological laboratory and explain the routes of laboratory acquired infection.

B. Do as directed: any two (2)

i. State the function of lysosomes.
ii. Give the significance of Chloroplast.
iii. State the function of eukaryotic vacuoles
iv. Name the protein that tags peptides intended for degradation.

Q5.A. Answer briefly any three of the following: (18)

i. Discuss the various types of polysaccharides.
ii. What is a peptide? Discuss the different types of proteins.
iii. Discuss the structure of a water molecule. How do polar molecules dissolve in water?
iv. Write a short note on types of lipids and their functions.
v. Differentiate between DNA & RNA.
vi. What is the importance of a functional group? Give any five functional groups present in biomolecules.

B. Give the structure formula of any two of the following: (2)

i. L-Alanine.
ii. D-Fructose
iii. Triacylglyceride
iv. Adenine.

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