SSR DEGREE COLLEGE, NIZAMABAD (5029)

DEPARTMENT OF MICROBIOLOGY

SEMESTER – II, Descriptive Questions

UNIT – I: Biological Macromolecules

Short Questions (4 Marks)

1. Monosaccharides
2. What are epimers
3. Define mutarotation
4. What are amino acids
5. Active site of an enzyme
6. Lock and key hypothesis of enzyme action

Essay Questions (10 Marks)

1. Describe carbohydrates with classification and examples.
2. Explain amino acids and proteins – types, structure and functions
3. Describe the classification of enzymes and explain the concept of active site and activation energy.
4. Explain the mechanism of enzyme action with lock and key and induced fit hypotheses.

UNIT – II: Basics to Molecular Biology

Short Questions (4 Marks)

1. Watson and Crick model of DNA
2. Mention the types of DNA
3. What is RNA? Name its types
4. Define plasmids
5. Semi-conservative replication of DNA
6. What is lac operon

Essay Questions (10 Marks)

1. Describe the structure of DNA according to Watson and Crick model.
2. Explain DNA and RNA as genetic material.
3. Describe the replication of DNA and explain the concept of gene.
4. Explain transcription and translation in prokaryotes with an introduction to the lac operon model.

UNIT – III: Biomolecular Chemistry

Short Questions (4 Marks)

1. Aerobic respiration
2. Anaerobic respiration
3. Glycolysis
4. HMP (Hexose Monophosphate) pathway
5. TCA (Tricarboxylic Acid) cycle
6. Electron transport chain (ETC)

Essay Questions (10 Marks)

1. Explain aerobic and anaerobic respiration.
2. Describe glycolysis, HMP (Hexose Monophosphate) pathway and ED (Entner–Doudoroff) pathway.
3. Explain the TCA cycle and electron transport chain, comparing mitochondrial and bacterial ETC.
4. Describe oxidative phosphorylation and substrate level phosphorylation and add a note on common microbial fermentations.

UNIT – IV: Biochemical Techniques

Short Questions (4 Marks)

1. Define buffers.
2. What is pH?
3. Colorimetry
4. Spectrophotometry
5. Chromatography
6. PAGE (Polyacrylamide Gel Electrophoresis)

Essay Questions (10 Marks)

1. Explain buffers, their types and role in biological reactions.
2. Describe the principle and applications of colorimetry and spectrophotometry.
3. Explain chromatographic techniques – thin layer and column chromatography.
4. Describe electrophoresis with special reference to agarose gel electrophoresis and PAGE (Polyacrylamide Gel Electrophoresis).