

Time: 3 Hours**Marks: 100**

- N.B.**
1. All questions are compulsory.
 2. Draw neat labelled diagrams wherever necessary.
 3. All questions carry equal marks.
 4. Use of simple calculator is allowed.

- Q.1 Attempt any two** **20**
- a. Classify amino acids based on their R groups and explain chemical structures of any two amino acids from each group.
 - b. Describe the classification of carbohydrates in detail.
 - c. What is enzyme inhibition? Describe any two types of inhibition in detail.
 - d. Explain the mode & mechanism of enzyme action.
- Q.2 Attempt any two** **20**
- a. What is role of Nitrate Reductase (NR) and Nitrogenase in Nitrogen fixation?
 - b. Explain the mechanism of assimilation of ammonia in higher plants.
 - c. Give the physiological effect and commercial applications of Gibberellins.
 - d. What are the physiological effects of Abscisic acid?
- Q.3 Attempt any two** **20**
- a. What is the molecular basis of spontaneous mutation?
 - b. What are induced mutations? Describe the role of UV light and X rays in inducing mutation.
 - c. Explain Bateson and Punnett's experiment on coupling and repulsion leading to linkage.
 - d. Construct a chromosome map from the given data:-

+ + + - 1370	+ + g - 185
v ct g - 1015	v ct + - 159
+ ct + - 249	+ ct g - 8
v + g - 254	v + + - 9
- Q.4 Attempt any two** **20**
- a. Explain BLAST and its applications.
 - b. How does Phylogenetic analysis help in commenting on the evolution between organisms?
 - c. Explain how comparison of protein structure helps in function prediction.
 - d. What are homologs? How does their study help to distinguish between proteins?
- Q.5 Write short notes on any four of the following** **20**
- a. Active sites and allosteric sites
 - b. Denitrification
 - c. Garrod's Hypothesis
 - d. Incomplete linkage
 - e. EMBL
 - f. SWISS PROT