3 Hours   Marks: 75/100

N.B. (1) **All** Questions are **compulsory**.
   (2) For **Paper students** each question carries 15 marks.
   (3) For **Research students,** each question carries 20 marks.

Q. 1 (a) Discuss (**any One**)   **7 /10**
   i) Restriction endonuclease with respect to classification, types of cuts with suitable examples and diagrams
   ii) Syzymes , bienzymes and poly enzymes

(b) Explain the following (**any One**)   **8/10**
   i) Use of site directed mutagenesis to introduce the disulphide bond in protein Engineering
   ii) Applications of flux control analysis with suitable examples

Q.2 (a) Answer the following (**any one**)   **7/10**
   i)Explain the strategies used to introduce insect resistance in plants
   ii) How marker genes are removed from chloroplast DNA

(b) Answer the following (any **one**)   **8/10**
   i) Discuss the methods of Genetic engineering of hydrogenase genes
   ii) Comment on the different methods of modification of foods to improve its taste by genetic engineering

Q.3 (a)Answer the following (**any One**):   **7/10**
   i) Discuss in brief the different air and water pollution monitoring methods
   ii)Explain the mode of action of *B.thuringensis* toxin and its applications

(b) Discuss the following (**any One**):   **8/10**
   i) Role of Antibiotics as a biocontrol agent
   ii) Advantages and Disadvatages of GMOs

Q. 4. (a) Attempt the following (**any One**)   **7/10**
   i) Describe in brief DNA microinjection method
   ii) Write a short note on applications of Nanobiotechnology

(b) Attempt the following (**any One**)   **8/10**
   i) Importance of IPR in biological research
   ii) Discuss the importance of transgenic animals in research

Q. 5 (a) Write short notes on the following (**any Three**)   **12/15**
   i) Synthesis of adhesive protein by recombinant DNA technology
   ii) Explain different promoters used in manipulation of gene expression
   iii) Siderophores
   iv) Pharmaceutical products obtained from transgenic animals

(b) Answer the following (**any one**)   **3/5**
   i)Justify the role of Nitrogenase enzyme in Nitrogen fixation
   ii) Write a short note on Biocontrol agents

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