Agricultural Bio-Technology (2006)

1. What are molecular markers? How do they differ from biochemical markers? Discuss their utility in plant bio technology with suitable examples.

2. List all possible comparison between the chloroplast genome and the nuclear genome. Describe the chloroplast transformation method and give its advantages over the nuclear transformation procedure in plants?

3. Describe the basic steps and mechanism of nitrogen fixation in legumes with special emphasis on the role of nif genes.

4. What is RNAi ? Describe the various mechanisms of nitrogen fixation in legumes with special emphasis on the role of nif genes.

5. Give the detailed account of the current status of transgenic crop at global level and critically view the importance of transgenic in Indian agriculture?

6. a)How is double fertilization accomplished in plants? What is the fate of egg and the endosperm nucleus?

   b) How does gamete formation in higher plants differ from that in higher animals?

OR

a) What is an enzyme and how does it works?

b)What are different methods of enzyme immobilization? Explain their industrial application with advantages?

7. Distinguish between forward and reverse genetics, and explain how these approaches are useful in crop improvement?

OR

What are different methods of gene isolation? Describe the essential steps involved in isolation of R genes from any plant species using map based cloning method.

8. What is a promoter? List various types of promoters with suitable examples in each case. Describe the available method of isolation of plant promoters?

OR

What is microarray technique? Give the principle on which it is based? What purpose is this technique widely used for? Describe the procedure in detail with suitable example?

9. What are QTLs? Explain how they are identified and used in crop improvement programmes?

OR

What is genetic linkage map? Describe the various steps involved in constructing a genetic linkage map in rice?

10. What is phytoremediation? How does it differ from other methods of bioremediation? Explain to detail the mode of action of phytoremediation with suitable examples.

OR

Describe the use of microbes for the production of: (a)Hydrogen, and (b)Hydrocarbons, as source of energy with associated advantages, if any.