

**KERALA AGRICULTURAL UNIVERSITY**  
**B.Sc. (Hons.) Agriculture – 2008 Admission - IV<sup>th</sup> Semester**  
**Final Examination – July-August 2010**

Cat. No. : Biot 2201

Max. marks: 80

Title : Principles of Plant Biotechnology, Bio-safety Rules and Intellectual Property Rights (2+1) Time : 3 hours

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I. Fill up the blanks

10

1. Products will be applicable for patenting only if they are Novel, Inventive and -----
2. Left handedness is seen in ----- form of DNA.
3. Okazaki fragments are produced in ----- strand.
4. Stable transformation of genes in case of plants can be done by -----.
5. Repairing of complementary strands of DNA after denaturation is called -----
6. Minisatellites are also known as -----.
7. ----- molecular marker is used for DNA fingerprinting.
8. Poly ethylene glycol induces -----.
9. Northern blotting is carried out for -----.
10. Particle gun method is called -----.

II. Write short notes/answers on **any ten**

30

1. IPR and international trade
2. DNA probe
3. Methods of transformation in genetic engineering
4. Steps involved in gene cloning
5. Marker assisted selection (MAS)
6. Protoplast fusion
7. Somaclonal variation
8. GM crops
9. Biosafety – Rules and regulations
10. Totipotency and morphogenesis
11. RAPD and SSR
12. Recombinant DNA technology

III. Write short essays on **any six** of the following

30

1. Write in detail about Golden rice
2. What are secondary metabolites? Name the three important secondary metabolites being commercially produced through tissue culture
3. Justify the impact of plant genetic engineering for crop improvement
4. What are QTLs? Explain how they are identified and used in crop improvement Programme.
5. Define callus and suspension cultures. Briefly describe the different types of suspension cultures and the various techniques for estimation of culture growth and viability of cells
6. What is somatic hybridization? Discuss different methods of isolation of Protoplasts and their fusion techniques.
7. Briefly describe the salient features of an ideal cloning vector. List the various types of cloning vectors and discuss their specific uses.
8. Protection of plant and animal genetic resources, biological materials, gene patenting—

Discuss

IV. Write essays on **Any one**

10

1. a) Give details about *Agrobacterium* mediated gene transformation in plants.  
b) What are molecular markers? How do they differ from biochemical markers? Discuss their utility in plant biotechnology.
2. a) Define somaclonal variation. Briefly describe their development, characterization, molecular basis and applications. Discuss their achievements, advantages, and limitations.  
b) What is somatic hybridization? Discuss different methods of isolation of protoplasts and their fusion technique