UG 6th Semester

CC- XIV (Plant Biotechnology)

Unit- I

Long Question

1. What are the aseptic techniques for tissue culture experimentation?

2. Briefly describe the composition of medium commonly used for plant tissue culture.

3. Discuss the key discoveries in the field of plant tissue culture.

Short Notes

1. MS media

2. Role of vitamins in plant tissue culture

3. Hormone requirements for plant tissue culture

4. Sterilization of explants

5. Flame sterilization

6. Autoclave

7. Laminar Air Flow

8. Filter sterilization

Unit- II

Long Question

1. Discuss the techniques of protoplast isolation and culture.

2. Describe the process of protoplast fusion for production of somatic hybrids.

3. Explain various techniques used for selection and analysis of hybrid cells.

4. Discuss various methods used for germplasm conservation.

Short Notes

1. Totipotency

2. organogenesis

3. embryogenesis

4. Cryopreservation

5. haploid production

6. production of secondary metabolites

7. anther culture

8. microspore culture

9. protoplast culture

10. applications of tissue culture

11. production of virus free plants

12. cybrids

13. germplasm conservation

Unit- III

Long Question

1. Discuss various molecular techniques of mapping of genomes.

2. Describe gene cloning. List the various approaches for obtaining the desired DNA segment for cloning and describe any one of them in some detail.

3. Define vector. Briefly describe the various kinds of vectors for cloning in E. Coli.

4. What are the features of a good vector? Briefly describe the features of one plasmid and one phage vector of E. Coli.

5. Briefly describe the different kinds of vectors available for yeast and discuss their advantages and limitations.

Short Notes

1. Cosmid vector

2. pBR322

3. BAC

4. Lambda phage

5. YAC

6. Phasmid

7. restriction enzymes

8. artificial chromosome vectors

9. bacterial transformation

10.role of restriction endonuclease in gene cloning

11. Shuttle vectors

12. Ti plasmid

Unit- IV

Long Question

1. What is polymerase chain reaction (PCR) ? Describe the principles of PCR.

2. Compare the use of PCR with that of gene cloning in molecular biology research. Do you think that PCR has largely replace gene cloning for applied and basic research in biotechnology?

3.Describe the different variants of basic PCR, which have been designed for a variety of purposes. Discuss the utility using specific examples.

4: Describe briefly the different applications of PCR for basic and applied research. Discuss the significance of the selection and designing of primers in these cases.

5. Discuss the utility of PCR for the study of (1) DNA polymorphism and (1) human genetics.

6. Describe the methods used for direct DNA transfer.

7. Describe various techniques utilized for introducing foreign DNA into the plant cells.

8. Describe cDNA and genomic DNA libraries.

9. What are reporter genes.

10. Describe various techniques for screening of DNA libraries.

11. Describe the method of *Agrobacterium*-mediated gene transfer.

Short Notes

1. Electroporation

2. Microinjection

3. inverse PCR.

4. anchored PCR

5. thermal cycler

6. RFLPs and RAPDs,

7. gene tagging using PCR

8. GUS

9. luciferase

10. biolistic

11. T - DNA

12. GEF

13. colony hybridization

Unit- V

Long Question

1. Discuss various applications of transgenic plants, and the problems encountered in their production and utilization.

2. Discuss the role of transgenics in bioremediation.

3. Plants may be used to produce edible vaccines. Describe the approaches, achievements and limitations in achieving this objective.

4. Describe the strategy for production of human growth hormone.

5. Describe the strategy for production of human insulin.

Short Notes

1. Bt- Cotton

2. Round up ready soybean

3. Flavr savr tomato

4. Moondust carnations

5. golden rice

6. superbug

7. edible vaccines

8. Industrial enzyme lipase

9. Industrial enzyme protease

10. Industrial enzyme aspergillase

11. Production of humulin

12. biosafety concerns