

KERALA AGRICULTURAL UNIVERSITY
B.Sc. (Ag) 2005 Admission VI Semester Final Examination
October 2008

Biot 3201
Introduction to Plant Biotechnology (1+1)

Max. Marks: 60
Time: 2 hours

Part A

I Answer all the TWENTY questions: 20 x 0.5= 10
Fill in the blanks

- A1. The asymbiotic germination of orchid was reported by _____
A2. Enzymatic isolation of protoplasts was first achieved by _____
A3. True to type clonal plants are produced by _____ technique
A4. The chemical used in doubling haploids generated through anther culture _____
A5. The process of developing an unorganized mass of cells on an explant _____

Give the name of

- A6. The technique to overcome post fertilization barrier
A7. A hybridization based molecular marker in applications of crop improvement
A8. A cryo-protectant used during cryopreservation of tissues
A9. A scoreable marker used to identify transformants in plant transformation
A10. A hybrid formed on fusion of protoplasts with one parental nucleus with both cytoplasm

True or false

- A11. The process of initiating unipolar structures with vascular attachment on an explant is termed as somatic embryogenesis
A12. The vehicles to carry foreign DNA from one organism to another is called as the vector
A13. Secondary metabolites exist in plants to combat against environmental stresses
A14. Axillary branching in micro propagation is achieved by addition of high levels of auxins in the medium
A15. All tissue cultured plants require a hardening process.

Choose the correct answer

- A16. Artificial seeds are encapsulated
(i) Seeds (ii) Somatic embryos (iii) Organs (iv) all the above
A17. Haploids can be produced by
(i) Delayed pollination (ii) microspore culture (iii) Unpollinated ovule culture (iv) All the above
A18. AFLP is a marker based on
(i) PCR alone (ii) PCR and southern hybridization (iii) southern hybridization (iv) None of the above
A19. *Agrobacterium tumefaciens* causes
(i) Crown gall (ii) Hairy root (iii) callus (iv) All the above
A20. The types of somaclonal variations observed during tissue culture are
(i) Physiological and Epigenetic, (ii) Physiological, epigenetic and genetic, (iii) Physiological and genetic (iv) Genetic and epigenetic

Part B

II Answer all the SIX questions in one or two sentences:

6 x 1 = 6

- B1. Define Totipotency
- B2. Define somatic hybrid
- B3. Define somaclonal variation
- B4. Define cryopreservation
- B5. Give any two reasons to state that meristem tips are virus free
- B6. Defend that Agrobacterium mediated transfer will give stable integration than biolistic method

Part C

III Answer any SIX questions in few sentences:

6 x 2 = 12

- C1. Distinguish between direct and indirect organogenesis
- C2. Embryo culture and embryo rescue
- C3. Anther and microspore culture
- C4. Cybrids and somatic hybrids
- C5. What are simple sequence repeats?
- C6. What are the different steps involved in PCR.
- C7. How will you assess the viability of protoplasts?
- C8. Describe liposome mediated gene transfer

Part.D.

IV Answer any FOUR questions

4 x 3 = 12

- D1. Explain the different pathways by which haploids are produced from anther.
- D2. Describe the different methods of protoplast fusion
- D3. Write a short paragraph on the different bio-safety levels for approval of GM crops.
- D4. Contribution of any six scientists in the field of plant tissue culture,
- D5. What are plant growth regulators? How will you classify them?
- D6. Briefly describe the shot gun apparatus used in direct gene transfer in plants.

Part E.

V Answer any FOUR of the following:

4 x 5 = 20

- E1. Discuss the problems and prospects of micro propagation.
- E2. How will you isolate protoplasts? Discuss the advantages of protoplast culture.
- E3. Write a summary on Agrobacterium mediated gene transfer in plants
- E4. Discuss the different steps involved in cryo preservation
- E5. Discuss the RFLP analysis as molecular marker to distinguish two different varieties.