KERALA AGRICULTURAL UNIVERSITY

B.Sc. (Ag) 2006 Admission VI Semester Final Examination

July / August 2009

Biot 3201

Introduction to plant biotechnology (1+1)

Max. Marks: 60

Time: 2 hours

**Part A**

Answer all the TWENTY questions: 20 x 0.5= 10

Fill in the blanks

A1.The scientist regarded as father of Plant tissue culture is_____

A2.Polymerase Chain Reaction (PCR) idea was conceived by_____

A3.Name a medium widely used for root cultures _____

A4.The selection agent used for screening variants for abiotic stress in tissue culture_____

A5. The gene responsible for pest resistance in cotton is _____

_____

Give the name of

A6. A technique used for culturing single cells

A7. RAPD technique (expand)

A8.An example for cytokinin

A9.A selectable marker used to identify transformants in plant transformation

A10.Enzymes that cut DNA at specific sequences

True of false

A11.The process of encapsulation of somatic embryos is to improve resistance to stresses

A12.Random integration and multiple inserts are peculiar with biolistic method of gene transfer

A13 Sucrose helps the micro-shoots in vitro to carry out their photosynthesis

A14.Adventitious shoots arise on leaves and young florets during micro propagation

A15 Redifferentiation is the process of the unorganized mass, regenerating into shoots

Choose the correct answer

GM

A16.Virus resistance ^ plants can be produced by

(i)Anti sense technology (ii) RNAi approach (iii) Expressing viral coat protein gene (iv) All the above

A17.Roundup Ready soybean refers to modification for

(i) Delayed ripening (ii) Pest resistance (iii) Herbicide resistance (iv) Enriched β carotene

A18. The enzyme Taq polymerase used in PCR reaction is isolated from

(i) *E.coli* (ii) *B.amyloliquifaciens* (iii) *Pseudomonas florescens* (iv) None of the above

A19 Callus induction is generally carried out achieved by supplementation of medium with

(i) Auxins (ii) cytokinins (iii) GA (iv) All the above

A20. Embryo rescue is practiced to rescue hybrids due to

(i) Nutritional deficiencies & wide hybridization (ii) Poor germination (iii) All the above (iv) None of the above

## Part B

Answer all the SIX questions in one or two sentences: 6x1 = 6

B1.What is recombinant DNA technology?
B2.What is micro-grafting?
B3.What is flavr-savr tomato?
B4.What is the role of Institutional Bio-safety committee in evaluation of transgenics.
B5.Give any two enzymes used in protoplast isolation
B6.Defend that meristem tip can produce only virus free and not virus resistant plants.

## Part C

Answer any SIX questions in few sentences: 6x2 = 12

C1.Distigush between organogenesis and embryogenesis
C2.Distinguish AFLP and RFLP
C3.Differentiate Selectable and scoreable marker
C4.Describe Binary and Co integrate vectors of Agrobacterium
C5.What are Macrocarriers and micro-carriers (in biolistic method of gene transfer)?
C6.What are peculiarities of tissue culture plants?.
C7. What are secondary metabolites? Give examples?
C8 Describe the *in vitro* fertilization technique in overcoming pre-fertilization barriers

## Part.D.

Answer any FOUR questions 4x 3=12

D1 Explain the different applications of callus and cell culture.
D2.Describe the method of embryo rescue. Write any two applications of embryo culture
D3. Write a short note on applications of anther culture in crop improvement.
D4. Write down any six GM plants with their modified character,
D5.How will you distinguish somatic hybrids after protoplast fusion?
D6.Briefly describe the advantages of molecular markers over the conventional morphological markers

## Part E.

Answer any FOUR of the following: 4 x 5=20

E1 Discuss the scope and importance of agricultural biotechnology in crop improvement.
E2.Write a summary on the different transgenics developed for various traits with examples.
E3.Write a summary on development of somacional variants for different stresses .Explain the advantages with few examples
E4.Discuss the different stages in micro propagation. Enumerate the advantages.
E5.Discuss the achievements/advantages of (a)protoplast fusion (b)*in vitro* germplasm conservation