Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(BT-NEW)/SEM-6/BT-601/2010

2010

PLANT BIOTECHNOLOGY

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Kinetin was discovered from

a) Coconut milk

b) Immature corn kernels

c) An old autoclaved sample of sperm DNA

d) Rice husk.

ii) Coconut milk is the rich source of

a) Auxin

b) Zeatin

c) Ethylene

d) ABA.

iii) One of the important prerequisite of haploid culture involves the exposure of anthers to

a) Chilling temperature

b) Freezing temperature

c) A dilute solution of ABA

d) 0·1% solution of H_2O_2.

iv) Ideal explant for establishing cell suspension culture is

a) Leaf mesophyll cells

b) A callus tissue

c) Shoot tips

d) Auxiliary buds.

v) First plant tissue culture media was formulated by

a) Murashige and Skoog

b) P. R. White

c) Gamborg

d) Nitsch and Nitsch.

vi) Coco is obtained from

a) *Coffea arabica*

b) *Theobroma cacao*

c) *Camellia* sp.

d) *Erythroxylon coca.*

vii) Salicylic acid, an important secondary metabolite, belongs to the group of

a) Terpenoids b) Phenolics

c) Alkaloids d) Carotenoids.

viii) The function of VirE is to

a) Make single-stranded DNA cuts

b) Act as activators of other Vir genes

c) Protect single strand T-DNA region

d) Act as constitutively expressed proteins.

ix) tRNAs are transcribed by

a) RNA polymerase I

b) RNA polymerase II

c) DNA polymerase

d) RNA polymerase III.

x) The nuclear genome of which of the plant species is made up of entirely single copy sequences ?

a) Arabidopsis

b) Rice

c) Pea

d) Wheat.

xi) Which one of the following is not an anti-cancer drug ?

a) Taxol

b) Podophyllotoxin

c) Vincristine

d) Digoxin.

xii) *Helicoverpa* sp. can be effectively controlled by application of

a) Basta or glufosinate

b) Glyphosate or roundup

c) Parathion

d) Cry proteins.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Mention briefly the major approaches in achieving embryos regenerated from somatic cells.

3. Describe the role of auxin and nitrogen in somatic embryogenesis.

4. What is open continuous culture ? How does it differ from batch culture ? 2 + 3

5. What is somaclonal variation ? Mention possible mechanisms of somaclonal variation. 1 + 4

6. Describe different strategies used in the production of herbicide resistant plants.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is haploid culture ?

   b) Briefly describe the different factors affecting *in vivo* androgenesis.

   c) "Plant production is usually achieved following two modes."Elucidate the approaches in plant tissue culture perspective with suitable example.

   d) Mention the application of haploid culture in plant biotechnology. 2 + 4 + 4 + 5

8. a) What do you mean by immobilization ?

   b) Mention its effectiveness in plants tissue culture.

c) Write any three polymers associated with immobilization.

d) Mention how viability can be tested in immobilized cells.

e) Mention two examples of secondary metabolites in immobilized system with product and the type of immobilization. 2 + 3 + 3 + 3 + 4

9. a) What is elicitors ?

b) Give an example of each type of elicitors.

c) Mention the role of elicitors in plant cell culture production with suitable example.

d) Mention the benefits of somaclonal variation for crop improvement. 2 + 3 + 4 + 6

10. a) What is T-DNA ?

b) Mention in brief the process of Ti-DNA transfer and integration in plant citing examples with suitable diagram.

c) Briefly describe vectorless plant DNA transfer methods. 2 + (4 + 5) + 4

11. Write short notes on the following : 3 × 5

a) PDS-1000-He.

b) Artificial seed.

c) Transposable element.