Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc.(H)(BT)/SEM-3/PBT-304/2011-12

2011

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 × 1 = 10

i) Bt toxins are usually active against

a) Lepidoptera b) Diptera

c) Coleoptera d) all of these.

ii) Unlike the somatic cells of animals, plant cells can be grown in tissue culture and regenerate new plants

a) because each cell contains the entire genome

b) because plant cells can dedifferentiate and revert back

c) because plant cells are able to express genes that were not previously expressed

d) none of these.

iii) The first experiment for Coat protein mediated cross protection to develop virus resistance was done with

a) TMV b) CaMV

c) BMV d) PMV.

iv) Alkaloids are ..... compounds.

a) nitrogenous b) sulphur containing

c) proteinaceous d) carbonaceous.

v) Cow pea trypsin inhibitor gene (CpTI) is used to develop tobacco

a) insect resistance b) fungus resistance

c) virus resistance d) bacteria resistance.

vi) The source of ipt gene is

a) *Bacillus thruringiensis* b) *Agrobacterium*

c) *Streptomyces* d) *Photorhabdus.*

vii) Which technique is used to introduce genes into dicots ?

a) Electroporation b) Particle acceleration

c) Microinjection d) Ti plasmid infection.

viii) Which cell-based plant technology involves the combining of two cells without cell walls from different species ?

a) Clonal propagation b) Cybridization

c) Protoplast fusion d) Mutant selection.

ix) The delayed ripening tomato was created by a biotechnology that ..... a gene.

a) altered b) silenced

c) replaced d) relocated.

x) The temperature of liquid nitrogen is

a) – 196°C b) – 99° C

c) – 201°C d) none of these.

xi) Of the three main types of restriction endonucleases which one is most useful in molecular cloning ?

a) Type I b) Type II

c) Type III d) All of these.

xii) Bt cotton is a

a) Pest resistant crop b) Bacteria resistant crop

c) Virus resistant crop d) None of these.

GROUP – B

(Short Answer Type Questions)

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

2. Write a short note on single cell clone.

3. Discuss briefly coat protein mediated resistance strategies for virus resistance in transgenic plants. Give one example. 4 + 1

4. Differentiate between food and organic food. What are preservatives ? 3 + 2

5. What are terpenes and phenolic compounds ? Write names of each compound. 3 + 2

6. What do you mean by plant cell bioreactor ? Explain with diagram. 2 + 3

GROUP – C

(Long Answer Type Questions)

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

7. Write short notes on any *three* of the following : 3 × 5

   a) Herbicide resistant plants

   b) Organic food

   c) Cryopreservation

   d) Micropropagation.

8. a) What do you mean by callus culture ? What are the major ethical concerns about GM crops and GM food ? 2 + 4

   b) Write down the approaches of transgenic plant. Write down the application of genetic engineering in crop improvement specially in production of herbicide resistance and insect resistance plants (give one example for each). 4 + 5

9. a) What is golden rice ? How can it be produced ? What are the health hazards it can cause ? 1 + 3 + 4

   b) Write an essay on future application of genetic engineering in food industry. What is Bt cotton ? 5 + 2

10. Write short notes on any *two* of the following : 15

    a) Edible vaccine

    b) Artificial seed

    c) Mechanism of somaclonal variation.

11. Explain the term "Germplasm conservation". Discuss *in vitro* and other *ex situ* methodologies of plant conservation. Differentiate between food and organic food. 2 + 8 + 5