Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc(H)(Genetics/Mol. Bio)/SEM-5/GEM-504/2011-12

2011

GENETIC MODIFICATION IN AGRICULTURE, FOOD INDUSTRY & MEDICINE

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

      a) insect resistance b) fungus resistance

      c) virus resistance d) bacteria resistance.

   ii) To make a herbicide resistance plant, right strategies are

      a) over production of the herbicide sensitive biochemical agent

      b) structural alteration of biochemical target

      c) detoxification by degrading the herbicide

d) all of these.

iii) A technique in which a chemical is used to make cells competent for DNA transfer is

a) southern blotting

b) electrophoresis

c) PEG method

d) immunoelectrophoresis.

iv) T-DNA is a

a) DNA of plasmid origin which is transferred to the agrobacterium chromosome

b) DNA from the chromosome of agrobacterium species which is transferred to the plant genome

c) DNA of plasmid origin which is transferred to the plant genome

d) none of these.

v) Genetic material of adenoviruses is

a) RNA b) single stranded DNA

c) double stranded DNA d) Plasmid.

vi) Octopine and Nopaline type of plasmids differ in their

a) organization of the Vir region

b) organization of the T-DNA and Vir region

c) organization of the T-DNA

d) all of these.

vii) T-DNA complex includes

a) T-DNA, Vir D2 and Vir E2

b) T-DNA and Vir G

c) T-DNA, Vir B and Vir E

d) T-DNA and Vir B.

viii) Genetic material of adenoviruses remains

a) free in the host nucleus

b) free in the host cytoplasm

c) integrated in host genome

d) alternated in free and integrated state in host genome.

ix) Movement of DNA from one bacteria to another through a tubular bridge or Pilus is

a) conjugation b) transposition

c) transfection d) transduction.

x) The insecticidal crystalline protein from *B. thuringiensis* were originlly classified as

a) α-endotoxin b) δ-endotoxin

c) β-endotoxin d) γ-endotoxin.

xi) The examples of genetic modification in crops for improved nutrition are

a) golden rice b) round up ready Canola

c) Flavr Savr tomato d) liberty link maize.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What is novel food ? What are the major ecological impacts of transgenic plants ? 1 + 4

3. How does organic food differ from conventional and genetically modified foods ? 5

4. Describe in brief how antisense technology is applied in transgenic plant production with a suitable example. 5

5. What is the role of Suicidal gene in cancer cell therapy ? 5

6. What is antisense approach of gene therapy ? 5

GROUP – C
(Long Answer Type Questions)

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

7. What do you mean by transgenic plants ? State different methods for producing transgenic plants. Name a bacterium used extensively as a vector to produce transgenic plants. Discuss the method of T-DNA transfer and its integration into the plant genome with suitable diagram. 2 + 4 + 1 + 8

8. What are the basic strategies for production of herbicide resistant transgenic plant ? How gene from *bacillus thuringiensis* provides insect resistance to crop plants when used for transgenic production ? What are the other non-Bt methods for insect resistant plant production ? 4 + 6 + 5

9. Define genetically modified foods. What are the reasons for production of genetically modified food ? What do you mean by golden rice ? Describe in brief the method of production of a GM food. 2 + 5 + 1 + 7

10. Discuss application and future application of genetic modification in food and agriculture.

11. What is SCID ? What are the causes of SCID ? What precisely has been done to patient Ashanti De Silva in 1990 by Dr. W.F. Anderson's group (NIH) in USA ? 2 + 3 + 10