



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 × 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



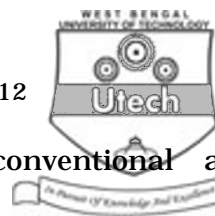
- d) T-DNA and Vir B.
- viii) Genetic material of adenoviruses remains
- a) free in the host nucleus
 - b) free in the host cytoplasm
 - c) integrated in host genome
 - d) alternated in free and integrated state in host genome.
- ix) Movement of DNA from one bacteria to another through a tubular bridge or Pilus is
- a) conjugation
 - b) transposition
 - c) transfection
 - d) transduction.
- x) The insecticidal crystalline protein from *B. thuringiensis* were originally 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. $3 \times 15 = 45$

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

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