

Biology-211  
Molecular  
15/11/15

**QP Code : 12869**

(2½ Hours)

[ Total Marks : 75

- N.B. :** (1) Attempt all questions.  
(2) All questions carry equal marks.  
(3) Draw neat labeled diagrams wherever necessary.

1. (a) Explain the following terms: (Any three) 3
- |                      |                          |
|----------------------|--------------------------|
| i) Heteroduplex DNA  | ii) Hfr strain           |
| iii) Helper phage    | iv) Host range property  |
| v) Transducing phage | vi) Homoallelic mutation |

- 1.b) Elaborate the following: (any two) 12
- Genetic mapping in bacteria by generalized transduction
  - Production of F<sup>+</sup> factor
  - Defining of genes by cis-trans tests
  - Natural transformation in bacteria

2. a) State the significance of: (any three) 3
- |                          |                                   |
|--------------------------|-----------------------------------|
| i) VirG protein          | ii) OriT                          |
| iii) Golden rice         | iv) Nopaline                      |
| v) Right border sequence | vi) Scorable marker/Reporter gene |

- 2.b) Attempt the following (any two) 12
- Describe the mechanism of T-DNA transfer and integration in to plant genome.
  - Particle gun method of gene delivery is an efficient method. Justify.
  - Give an account of development of insect resistant plants with example.
  - Enlist the advantages and disadvantages of genetically modified crops.

- 3.a) Give the importance of: (any three) 3
- |                       |                           |
|-----------------------|---------------------------|
| i) Enucleation        | ii) Pregnant mare's serum |
| iii) ES cells         | iv) Gancyclovir           |
| v) Antifreeze protein | vi) DNA microinjection    |

- b) Discuss the following: (any two) 12
- i) Cloning live stock by nuclear transfer.
  - ii) Transgenic fish as biosensor.
  - iii) Applications of transgenic sheep.
  - iv) Any one method for producing transgenic mouse.
- 4.a) Explain the following terms (any three): 3
- i) Replicative transposition
  - ii) Non-autonomous transposable elements
  - iii) Constitutive gene
  - iv) lac I<sup>-</sup>mutant
  - v) O<sup>-</sup>mutant
  - vi) Leader peptide
4. b) Give an account of the following: (any two) 12
- i) Types of prokaryotic transposons
  - ii) Differences between composite and non-composite transposons
  - iii) Molecular model of attenuation of the trp operon
  - iv) Effects of repressor mutations with reference to lac operon
5. Write Short notes on (any three) 15
- i) Virus mediated gene transfer in plants.
  - ii) Production and significance of edible vaccines.
  - iii) Use of transgenic mice as models for Alzheimers disease
  - iv) Life cycle of  $\lambda$  phage
  - v) Role of c AMP in the functioning of lac operon
  - vi) Kernel color in corn and transposon effects