

(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)

- | | |
|----------------------|--------------------------|
| i) Heteroduplex DNA | ii) Hfr strain |
| iii) Helper phage | iv) Host range property |
| v) Transducing phage | vi) Homoallelic mutation |

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1.b) Elaborate the following: (any two)

- Genetic mapping in bacteria by generalized transduction
- Production of F¹ factor
- Defining of genes by cis-trans tests
- Natural transformation in bacteria

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2. a) State the significance of: (any three)

- | | |
|--------------------------|-----------------------------------|
| i) VirG protein | ii) OriT |
| iii) Golden rice | iv) Nopaline |
| v) Right border sequence | vi) Scorable marker/Reporter gene |

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2.b) Attempt the following (any two)

- 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.

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3.a) Give the importance of: (any three)

- | | |
|-----------------------|---------------------------|
| i) Enucleation | ii) Pregnant mare's serum |
| iii) ES cells | iv) Gancyclovir |
| v) Antifreeze protein | vi) DNA microinjection |

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b) Discuss the following: (any two)

- 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.

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4.a) Explain the following terms (any three):

- i) Replicative transposition
- ii) Non-autonomous transposable elements
- iii) Constitutive gene
- iv) lac I^s mutant
- v) O^c mutant
- vi) Leader peptide

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4. b) Give an account of the following: (any two)

- 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

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5. Write Short notes on (any three)

- 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 λ phage
- v) Role of c AMP in the functioning of lac operon
- vi) Kernel color in corn and transposon effects

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