

- Attempt all questions.
 All questions carry equal marks.
 Draw neat and labelled diagrams wherever necessary.

(a) Give the definitions of (any three)

- | | |
|--------------------------|------------------------|
| i) F ⁺ factor | iv) Intragenic mapping |
| ii) Prototroph | v) Host range property |
| iii) Temperate phage | vi) att lambda site |

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(b) Attempt the following (any two)

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- Diagrammatically explain the transfer of genetic material during conjugation in *E. coli*.
- "Gene order and map distance may be determined using generalised transduction." Justify.
- Explain the types of bacterial transformation giving suitable examples.
- Describe the test for determining the units of function in the rII region.

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(a) Give the role / function of (any three)

- Reporter gene
- Agropine
- Gemini virus
- micro T_i
- Wound response
- Disarming

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(b) Elaborate on the following (any two)

- Liposome mediated gene transfer.
- Production and use of edible vaccines.
- Microprojectile method for gene delivery.
- Gene transfer in *Agrobacterium* by binary vector method.

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(a) Explain the term (any three)

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|--------------------------|---------------------|
| i) Stem cell | iv) Knock out mouse |
| ii) Transgenesis | v) Multipotency |
| iii) Anti freeze protein | vi) Cloning |

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- (b) Discuss the following (any two)
- Application of nuclear transfer technique in biopharming.
 - Method for the production of transgenic fish.
 - Applications of transgenic mice.
 - Methods for selection of transformed cells in animal transgenesis.

- 4 (a) Do as directed (any three)
- Give the significance of Beta lactamase.
 - What is co-ordinate induction?
 - Define -conservative transposition.
 - State the importance of transposase.
 - Name the product of trp A gene.
 - Explain the term regulated genes.

- Q. 4 (b) Answer the following (any two)
- Describe the effects of lac I mutations.
 - Discuss the role of cAMP in the functioning of lac operon.
 - What are IS elements? State their features.
 - Give an account of transposition mechanism in plants.

- Q. 5 Write Short notes on (any three)
- Retroviral method for production of transgenic mice.
 - DNA uptake by protoplasts.
 - Bt cotton.
 - Deletion mapping of the r II region in T4 phage.
 - Non composite transposons.
 - cis dominant mutations.