

2 ½ Hours

Total Marks: 75

1. All questions are **compulsory**.
2. All questions carry **equal** marks.
3. Draw **neat, labelled diagrams** wherever necessary.

- Q. 1 a.** Define (**any three**): **03**
- i Minimal medium.
 - ii Transconjugant.
 - iii Transformation.
 - iv Lysogeny.
 - v Co-transduction.
 - vi Non-permissive host.
- b.** Attempt the following (**any two**): **12**
- i. Conjugation can be used to map bacterial genes. Justify
 - ii. Elaborate on specialized transduction.
 - iii. How can genes be defined by complementation tests?
 - iv. Describe the life cycle of a temperate phage.
- Q. 2 a.** Give the significance of (**any three**): **03**
- i Reporter gene.
 - ii Promoter.
 - iii Opine.
 - iv T-DNA.
 - v Disarming.
 - vi PEG.
- b.** Give an account of the following (**any two**): **12**
- i. Liposome mediated gene transfer.
 - ii. The structure of Binary vector..
 - iii. Insect resistant plant with suitable example.
 - iv. Transformation of rice to produce Golden Rice.
- Q. 3 a.** What do you understand by the following terms (**any three**): **03**
- i Transgenic mouse
 - ii Retrovirus
 - iii Pronucleus
 - iv ES cell
 - v G₀ phase
 - vi Cloning

- b.** Answer the following (**any two**): **12**
- i. What is positive negative selection? How does it work?
 - ii. Discuss: Establishment of transgenic mouse using ES cells
 - iii. Describe the construction of transgenic livestock.
 - iv. Explain the construction of a lentivirus derived vector
- Q. 4 a.** Explain the following (**any three**): **03**
- i. Polycistronic mRNA.
 - ii. Inducer
 - iii. Resolvase
 - iv. *lac I SQ*
 - v. *lac Z*
 - vi. Leader region
- b.** Discuss the following (**any two**): **12**
- i. Positive control of lac operon.
 - ii. Attenuation model of trp operon.
 - iii. Jumping genes in maize.
 - iv. Cointegration model for the replicative transposition.
- Q. 5** Write short notes on of the following (**any three**): **15**
- a. Applications of transgenic fish.
 - b. Determination of gene order by transformation.
 - c. Applications of transgenic plants.
 - d. Advantages of edible vaccines.
 - e. IS elements.
 - f. Operator mutations of lac operon.
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