Q.P. Code : **77113**

(2½ Hours) [Total Marks : 75

N.B. : (1) Attempt all questions
(2) Draw diagrams wherever necessary
(3) Figures to the right indicate marks

1. (a) Explain the following terms: (any **three**) **3**
   (i) Pili
   (ii) Helper phage
   (iii) Competent cells
   (iv) Permissive host
   (v) Complete media
   (vi) Hfr strain

   (b) Elaborate the following: (any **two**) **12**
   (i) Conjugation as a method of mapping bacterial gene
   (ii) Specialized transduction
   (iii) Defining genes by complementation tests
   (iv) Natural transformation in bacteria

2. (a) State the significance of: (any **three**) **3**
   (i) Golden rice
   (ii) Protoplast fusion
   (iii) Agropine
   (iv) Selectable marker
   (v) T_i plasmid
   (vi) Gemini virus

   (b) Describe the following: (any **two**) **12**
   (i) DNA uptake by electroporation
   (ii) Role of virus in transgenesis
   (iii) Action of *Cry* protein
   (iv) Transgenic plants in improving the nutritive value of food

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3. (a) Do as directed: (any **three**) **3**
   - (i) DNA microinjection
   - (ii) Knockout mice
   - (iii) Stem cells
   - (iv) Nuclear transfer
   - (v) Gancyclovir
   - (vi) Enucleation

   (b) Give an account of: (any **two**) **12**
   - (i) Embryonic stem cell method for producing transgenic mice
   - (ii) Applications of Transgenic sheep
   - (iii) Methods for producing transgenic fish
   - (iv) Microinjection method of animal transgenesis

4. (a) Define: (any **three**) **3**
   - (i) Transposons
   - (ii) Constitutive genes
   - (iii) Leader region
   - (iv) Repressor molecule
   - (v) Operon
   - (vi) Polycistronic mRNA

   (b) Elaborate on: (any **two**) **12**
   - (i) Effects of *lac I* mutations
   - (ii) Organization of trp operon
   - (iii) Transposition in plants
   - (iv) Role of high level of tryptophan in the regulation of trp operon

5. Write short notes on: (any **three**) **15**
   - (i) Mechanism of T DNA transfer
   - (ii) *lac* I^S mutants
   - (iii) Retroviral method of transgenic mice production
   - (iv) IS Elements
   - (v) Generalized transduction
   - (vi) Distinguishing features of composite and non-composite transposons

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