Q.P. Code :19316

[Time: 2:30 Hours] **[Marks:75]**

N.B: Please check whether you have got the right question paper.
1. Attempt all questions.
2. All questions carry equal marks.
3. Draw neat labeled diagrams wherever necessary.

Q.1 a. Explain the following terms: **(Any three)** **(03)**
i) Hfr strain
ii) Engineered transformation
iii) Lysogeny
iv) Heteroallelic mutation
v) Cotransduction
vi) Plaque

Q.1 b. Attempt the following: [Any two] **(12)**
i) Diagrammatically describe transfer of genetic material during conjugation in *E.coli*.
ii) Transformation can be used to construct genetic maps for bacterial species. Justify.
iii) Describe the fine structure analysis of the rII region of bacteriophage T4.
iv) What are stable and unstable transductions? How are they formed?

Q.2 a. Do as directed **(Any three)** **(03)**
i) _____enzyme encoded by the IS element is responsible for transposition.
ii) Define: Inducer
iii) Give the function of Ac element in corn.
iv) State the role of Q protein.
v) What is an aporepressor protein?
vi) State the effect of superrepressor mutations of *lacI* gene.

Q.2 b. Discuss the following: **(Any two)** **(12)**
i) Positive control of the lac Operon.
ii) Lysogenic development in λ phage.
iii) Molecular model of attenuation.
iv) Composite and non-composite transportation in prokaryotes.

Q.3 a. Do as instructed **(Any three)** **(03)**
i) Give an example of type II restriction enzyme.
ii) State true or false: Cosmids have origin of replication of both, plasmid and lambda phage.
iii) State the significance of opines.
iv) State the importance of 'Vir genes'.
v) Give significance of BAC vectors.
vi) Give one application of SI nuclease.

Q.3 b. Answer the following **(Any two)** (12)

i) What are restriction enzymes? Explain its types.
ii) What are the properties of pBR322?
iii) What is the structure of cointegreate vector? Explain with the help of a diagram.
iv) What is the mechanism of action of DNA ligases? State its applications.

Q.4 a. State the significance of the following. **(Any three)** (03)

i) Oligo d T column
ii) Reverse transcriptase
iii) Autoradiography
iv) Heterologous probes
v) URA 3 marker
vi) Restriction map

Q.4 **b.** Give an account of the following. **(Any two)** (12)

i) Construction of genomic library
ii) Synthesis of cDNA
iii) Identification of genes using complementation of mutation
iv) Analysis of cloned DNA

Q.5 Write short notes on **(Any three)** **(15)**

i) Chromosomal library
ii) Random priming method
iii) Generalized transduction
iv) *Lac* O^c mutation
v) *Cosmids*
vi) Terminal transferase

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