Q. P. Code: 31702

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. Explain the following terms **(any three):** **03**

i Homopolymer tailing.
ii Ligation.
iii Isoschizomer.
iv Host controlled restriction.
v Cohesive end.
vi Restriction site.

b. Give an account of the following **(any two)**: **12**

i. Mode of action of RNA directed DNA polymerases
ii. Source and mechanism of action of Polynucleotide kinases.
iii. Types of nucleases and its role in rDNA technology.
iv. Alkaline phosphatase and its applications.

Q. 2 a. Explain the following terms **(any three)**: **03**

i Vector.
ii Vir gene.
iii Copy number.
iv Polylinker site.
v Cosmid.
vi Cloning.

b. Discuss the following **(any two):** **12**

i. Criteria to design an ideal cloning vector.
ii. Shuttle vectors with a suitable example.
iii. Construction and application of cosmid cloning vectors.
iv. Advantages of pBR322.

Q. 3 a. Do as directed **(any three):** **03**

i Define genomic libraries.
ii State the significance of 'hydrazine' in Maxam- Gilbert method of DNA sequencing.
iii Define 'primer'.
iv Fill in the blank: Northern hybridization involves the transfer of _____ from gel to nitrocellulose membrane.

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v State true or false: Linkers are used to create sticky ends on blunt ended DNA.

vi State the significance of *Taq* polymerase.

b. Attempt the following **(any two):** **12**

i. Elaborate on construction of cDNA libraries.

ii. Explain Sanger's method of DNA sequencing.

iii. Write a note on 'Restriction mapping'.

iv. Describe screening of a genomic library.

Q. 4 a. What do you understand by the following terms? **(any three):** **03**

i RFLP

ii Gene Augmentation.

iii Germ line gene therapy.

iv Subunit vaccine.

v Attenuated vaccine.

vi Microprojectile.

b. Answer the following **(any two):** **12**

i. Explain the use of restriction endonuclease in the detection of disease.

ii. Differentiate between somatic and germ line gene therapy.

iii. Give an account of the advantages of recombinant vaccines over traditional vaccines.

iv Diagrammatically explain the preparation of Subunit vaccine against HSV.

Q. 5 Write short notes on of the following (**any three):** **15**

i. DNA polymerase I

ii. M13 based vectors.

iii. Thymidine kinase marker in vaccine preparation.

iv Insulin production using recombinant DNA technology.

v. Applications of DNA typing.

vi. Southern hybridization.