

**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.