

**RAN-2003001105020005****B. Sc. Biotechnology (Old) (Sem.-V) Examination October - 2025****BT-15: Genetic Engineering****Time: 2 Hours]****[Total Marks: 50****સૂચના : / Instructions**

- (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book
- (2) Figures to the right indicate full marks.
- (3) Draw neat and labelled diagrams wherever necessary.

Seat No.:

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Student's Signature

Q.1. Attempt the following questions in short (Any Four)**8**

- Explain the advantages of electroporation in DNA transfer.
- Describe two features of type II restriction endonucleases.
- Define competency and explain its importance in transformation.
- What is a phagemid? How does it differ from a plasmid?
- State the function of insertion sequence (IS) elements in vectors.

Q.2. Attempt Any Two:**14**

- Explain the concept of gene cloning and its significance in biotechnology.
- Provide an overview of Ti plasmids with a neat diagram.
- Discuss vectors based on M13 and their applications.

Q.3. Explain in detail Any Two:**14**

- What is blue-white screening? Explain in detail.
- Methods of gene transfer in eukaryotic cells.
- Describe the process and applications of in vitro packaging of lambda DNA.

Q.4. Attempt Any Two of the following:**14**

- Outline the process and applications of real-time PCR.
- Compare colony hybridization and plaque hybridization techniques.
- Write a note on primer designing and its importance.