

B.Sc. Semester - 6 (NEP-2020) Examination**March/April-2026****BIT: Genetic Engineering and Genomic Applications (Major-14)****Time: 2:00 Hours****Marks:50****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 Write a note on

- (1) Shuttle and expression vectors. (05)
- (2) Blue-white selection. (05)

OR

- (1) Types and mode of action of restriction endonucleases. (05)
- (2) Mechanisms and applications of DNA ligases. (05)

Que.2 Write a note on

- (1) Bacterial conjugation. (05)
- (2) Expression of recombinant genes in plant systems. (05)

OR

- (1) Liposome-mediated transfer. (05)
- (2) Detection and confirmation of transformants by hybridization. (05)

Que.3 Write a note on

- (1) CRISPR-Cas9 system- components and mechanism in medicine. (05)
- (2) Traditional vs. modern techniques of genome editing. (05)

OR

- (1) Gene therapy approaches – ex vivo and in vivo. (05)
- (2) Methods of site-directed mutagenesis. (05)

Que.4 Write a note on

- (1) Transgenic plants and animals. (05)
- (2) GMOs. (05)

OR

- (1) Applications of gene therapy. (05)
- (2) Production of monoclonal antibodies. (05)

Que.5 Write a note on

- (1) Protocol of transformation in prokaryotes. (05)
- (2) Plasmids as a cloning vectors. (05)

OR

- (1) Biosafety levels. (05)
- (2) RNA interference. (05)
