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B. Sc. Course (CBCS) Ordinance Sem-VI

EXAMINATION APRIL 2023

BOTANY- MOLECULAR BIOLOGY & GENETIC ENGINEERING

[Time:2 Hours]

[Max. Marks:80]

**Instructions:** 1) All questions are compulsory

2) Answer sub-questions in Q.1 and Q.2 briefly.

3) Figure to the **right** indicates maximum marks assigned to the question.

4) **Draw** appropriate labelled diagrams **wherever** necessary.

**Q.1** Answer **any four** of the following:

4x4=16

- 1) Comment on the organization of DNA in prokaryotes.
- 2) Write briefly on RNA silencing.
- 3) Distinguish between gene organization in prokaryotes and eukaryotes.
- 4) Explain in brief the steps in genetic engineering.
- 5) Write briefly on production of edible vaccines.
- 6) List the steps involved in construction of a genomic library.

**Q.2** Write short notes on **any four** of the following:

4x4=16

- a) Rolling circle mechanism of DNA replication.
- b) Role of DNA dependent RNA polymerase enzyme.
- c) Disulphide linkage formation during post-translation modification.
- d) Basic structure and importance of cosmid vectors.
- e) Production and advantages of hairy root cultures.
- f) Development of herbicide resistant soybean plants.

**Q3** A. Write briefly on types of RNA.

6

OR

A. Explain in brief the process of transcription in eukaryotes.

6

B. Explain the characteristics of the genetic code.

6

**Q.4** A. Explain the 'initiation' and 'termination' stages of translation in protein synthesis.

6

OR

A. Explain how the 'Hershey-Chase Experiment' supports that DNA is the genetic material.

6

B. What are split genes? Explain removal of introns by spliceosome machinery.

6



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Q.5 A. Explain the technique of plant transformation using gene gun. 6

OR

A. With the help of suitable examples, explain the use of restriction enzymes in recombinant DNA work. 6

B. Explain the steps in isolation of plant DNA. 6

Q.6 A. What is western blotting? Give any 2 methods for analysis of the blotted sample. 6

OR

A. Write an account on development and characteristics of golden rice. 6

B. Explain the technique of DNA amplification by PCR. 6