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B.Sc./5th Sem/BOT/25(NEP)

2025

5th Semester Examination (CCFUP : NEP)

BOTANY

Paper : MJ 9-T (Single Core Major)

[Molecular Biology & Plant Biotechnology]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *five* questions : 2×5=10

1. What are nucleic acids? Name the two main types of nucleic acids with examples.
2. Write any two differences between DNA and RNA.
3. What is a shuttle vector?
4. Name the enzyme responsible for :
 - (a) unwinding the DNA helix
 - (b) joining Okazaki fragments.
5. What is transcription? Name the enzyme involved in this process.

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6. What is RNA splicing? Mention one type of RNA involved in this process.

7. Define translation. Which element play catalytic role in this process?

8. What kind of modification is done in the transgenic development of Flavr Savr tomato?

Group - B

Answer any *four* questions : 5×4=20

9. Describe the nucleosome structure. 5

10. Explain the mechanism of DNA replication in prokaryotes, mentioning the role of different enzymes involved in the process. 3+2

11. Briefly describe the mechanism of gene silencing. How is DNA replication semiconservative? 4+1

12. Describe the process of transcription in eukaryotes, mentioning the stages of initiation, elongation and termination. 5

13. Explain the post-transcriptional modifications of RNA in eukaryotic cells. Describe any three modifications and state their significance. 2½+2½

14. Describe PCR mediated DNA amplification. 5

Group - C

Answer any *one* question : 10×1=10

15. Describe in detail the structure of nucleic acids, with special reference to DNA. Explain the types of bonds involved and their biological significance. 6+4

16. Describe the method of Agrobacterium mediated gene transfer. How can the presence of a transgene be confirmed using GFP? 6+4

