FYUGP/Sem-6/BT-CE2

# 2026

## Botany (Core)

### Paper Code : BT-CE-6324

### Paper Name : Molecular Biology & Biotechnology

*Time : 2 hours* *Full Marks : 50*

*The figures in the margin indicate full marks for the questions.*

1. Answer the following questions : 1×4=4
   a) What is an intron ?
   b) Write the full form of SDS-PAGE.
   c) What is a cosmid ?
   d) What are the proteins are associated with the nucleosome ?
2. Answer the following questions : 2×3=6
   a) What is totipotency ? Define a somatic embryo.
   b) Explain the role of helicase and DNA polymerase in DNA replication.
   c) Describe the function of Okazaki fragments in DNA replication.
3. Answer the following questions *(any two)* : 5×2=10
   a) Write briefly on the core characteristics of the genetic code.
   b) What are exons ? Describe briefly the intron splicing process in eukaryotes.
   c) Explain how RNA processing is linked to the unidirectional flow of genetic information as described in the Central Dogma of Molecular Biology.

*Contd..*

d) Elaborate concisely on the key steps of creating a Chimera or GMO.

4. Answer the following questions ***(any three)*** : 10×3=30

a) Briefly explain the type of virus vectors are used in gene cloning. 10

b) Write briefly on various proteomics techniques and about the various functional genomics approaches that can be utilized. 5+5=10

c) Write briefly on the ethical considerations in genetic engineering in terms of environmental and societal impacts. Mention briefly the structured protocols of bio-safety regulations and guidelines. 5+5=10

d) Describe the methods of cryopreservation bringing to focus it's importance in biotechnology. 10

e) What does the SDS PAGE stand for ? Describe in detail 1D, 2D electrophoresis in protein purification. 10

f) Describe the steps involved in initiation, elongation and termination along with the role of key enzymes in DNA Replication. 10

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