

**(FOR THE CANDIDATES ADMITTED
DURING THE ACADEMIC YEAR 2023 ONLY)**

23UBY612

REG.NO. :

**N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS :APRIL - 2026
B.Sc.-BOTANY
SEMESTER: VI
MAXIMUM MARKS: 75
TIME : 3 HOURS**

**PART - III
BIOTECHNOLOGY AND GENETIC ENGINEERING**

SECTION – A (10 X 1 = 10 MARKS)

**ANSWER THE FOLLOWING QUESTIONS. (K1)
MULTIPLE CHOICE QUESTIONS.**

1. The ability of a single plant cell to regenerate into a whole plant is called:_____.
a) Dedifferentiation b) Pluripotency c) Totipotency d) Redifferentiation
2. What are some key applications of somatic embryogenesis?
a) Creating somatic hybrids (e.g., Pomato) b) Micropropagation and production of artificial seeds
c) Gene cloning d) Meiosis
3. Klenow fragment is derived from_____.
a) DNA Ligase b) DNA Pol-I c) DNA Pol-II d) Reverse Transcriptase
4. Southern blotting is _____.
a. Attachment of probes to DNA fragments
b. Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet
c. Comparison of DNA fragments to two sources
d. Transfer of DNA fragments to electrophoretic gel from cellulose membrane
5. The DNA fragments have sticky ends due to_____.
a. Endonucleases b) Unpaired bases c) Calcium ions d) Free methylation

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)

6. What is the purpose of callus formation in plant cell differentiation?
7. Differentiate cybrid and hybrid.
8. How are transposable elements identified?
9. Why is it called a western blot?
10. What is the DNA vaccine for rabies?

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K3)

11. a) Discuss the scope and importance of plant tissue culture .

(OR)

- b) Find out the advantages of cell suspension culture and meristem culture.

- 12.a) Collect the methods and factors affected in anther culture.

(OR)

- b) Write the methods of somatic hybridization. Add notes on its applications

(CONTD 2)

- 13.a) Enumerate the salient features of pBR322 vector. Mention its advantages
(OR)
b) Determine the main use of bacterial artificial chromosome vector
- 14.a) Organize the principle and applications of southern blotting
(OR)
b) Compute the role of molecular marks in r DNA technology
- 15.a) Analyse the types, limitation and applications in DNA fingerprinting in forensic science
(OR)
b) How is DNA barcoding used in modern Research?- Discuss

SECTION – C**(5 X 8 = 40 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.****(K4 (Or) K5)**

16. a) Examine the stages and applications of Micropropagation.
(OR)
b) How do you formulate the tissue culture media? – Explain in detail
- 17.a) Focus the process and applications of somatic embryogenesis.
(OR)
b) Illustrate the isolation and regeneration methods of protoplast
18. a) How do transposable elements regulate mammalian genomes? – Discuss
(OR)
b) Classify the molecular tools used in genetic engineering
- 19.a) Assess the role of *Agrobacterium tumefaciens* in gene cloning.
(OR)
b) Mark the principle and applications of Northern blotting.
- 20.a) Evaluate the types, public concern and importance of transgenic plants .
(OR)
b) Organize the types of IPR. Highlight the safeguard against intellectual property rights.
