

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END THEORY EXAMINATION

B.Sc.(Hons.) Horticulture

Semester	: III (New)	Term	: First	Academic Year	: 2023-24
Course No.	: II/BIOT 231	Title	: Elementary Plant Biotechnology		
Credits	: 2 (1+1)	Time	: 9:00 to 11:00 hrs.	Total Marks	: 40
Day & Date	: Tuesday, 12.12.2023				

- Note :**
1. Solve ANY EIGHT questions from SECTION 'A'.
 2. All questions from SECTION 'B' are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagram wherever necessary.

SECTION 'A'

- Q.1 Define Molecular marker. Enlist various types of molecular marker. State their applications for crop improvement.
- Q.2 Define Somaclonal variations. What are causes/reasons of induction of somaclonal variation in plants?
- Q.3 a) Define Nutrient media. Name three antioxidants and three antibiotics used in media.
b) Define Totipotency and explain it with reference to dedifferentiation and redifferentiation.
- Q.4 a) Define Micropropagation. State the advantages of micropropagation.
b) Write in detail about three steps of PCR technique.
- Q.5 Define Blotting. Enlist the types of blotting. Distinguish between Southern and Northern blotting techniques.
- Q.6 Define DNA fingerprinting. Write in detail the procedure of DNA fingerprinting.
- Q.7 a) Describe two types of somatic embryogenesis. Write its applications.
b) Write precisely about protoplast fusion by spontaneous fusion method and induced fusion method.
- Q.8 Define Plant Biotechnology. Discuss at length about importance of Biotechnology in Horticulture.
- Q.9 a) What is Test tube fertilization? State its applications.
b) Define Genetic Engineering. Enlist vector-mediated and vector-less methods of gene transfer.
- Q.10 Write short notes on (Any Two):
- a) Three types of nanomaterial with examples of Nano-biotechnology
 - b) Applications of marker-assisted selection in crop improvement
 - c) Synthetic /Artificial seed

(P.T.O.)

SECTION 'B'

Q.11 Match the pairs:

- | 'A' | 'B' |
|-------------------------------------|--------------------------------|
| 1) Meristem culture | a) Crown gall disease |
| 2) <i>Agrobacterium tumefaciens</i> | b) Callus |
| 3) <i>Thermus aquaticus</i> | c) Virus-free plants of Dahlia |
| 4) Habituation | d) DNA polymerase |

Q.12 State True or False:

- 1) Letham derived kinetin-like substance from Maize endosperm and named it Picloram.
- 2) Glossy and glassy appearance of tissue cultured plants is called *ex vitro*.
- 3) EDTA is not a chelating agent.
- 4) Tissue cultured plants within *in vitro* conditions are autotrophic in nature.

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