

**Total Pages : 8**

**H-6825**

**M.Sc. (Semester-II) Examination, July 2022**

**MICROBIOLOGY**

**( Plant and Animal Biotechnology )**

***Time Allowed : Three Hours***

***Maximum Marks : 70***

***Minimum Passing Marks : 25***

**Note :** This question paper is in four sections. **All** sections are **compulsory**. Attempt questions as per instructions given in each section.

**SECTION-A**

**( Objective Type Questions )**

**Note :** Attempt **any ten** questions. Each question carries **1** mark. [10x1=10]

**H-6825/1000**

**( 1 )**

**[P.T.O.]**

1. (i) Which of the following is best suited method for production of virus free plants ?
- (a) Embryo culture
  - (b) Meristem culture
  - (c) Ovule culture
  - (d) Anther culture
- (ii) The variation in in-vitro culture is called as :
- (a) In-vitro variation
  - (b) Mutation
  - (c) Somaclonal variation
  - (d) All of these
- (iii) Haploid plants are produced in large numbers by :
- (a) Anther culture
  - (b) Ovary culture
  - (c) Embryo culture
  - (d) Both (a) and (b)

- (iv) Cybrids are :
- (a) Nuclear hybrids
  - (b) Hybrid plants from cross pollination
  - (c) Cytoplasmic hybrid
  - (d) Cytological hybrids
- (v) A group of genetically similar organism obtained by asexual reproduction is called :
- (a) Clone
  - (b) Population
  - (c) Assembly
  - (d) None of these
- (vi) Which of the following enzyme are popularly called 'Molecular Stickers' ?
- (a) Restriction endonuclease
  - (b) Ligases
  - (c) RNA polymerase
  - (d) DNA polymerase

- (vii) Bt cotton is a/an :
- (a) Insecticide sprayed on cotton plant
  - (b) Cotton variety from South America
  - (c) Transgenic cotton variety
  - (d) None of the above
- (viii) What enzyme is used in CRISPR gene editing ?
- (a) Cas 3
  - (b) Cpr 9
  - (c) RNA 5
  - (d) Cas 9
- (ix) Golden rice contains :
- (a) Trace of gold
  - (b)  $\beta$ -carotene
  - (c) Both (a) and (b)
  - (d) None of the above

(x) A gene for insulin has been inserted into a vector for obtaining the protein product. Such vector is called :

- (a) Expression vector
- (b) Supression vector
- (c) Storage vector
- (d) None of the above

(xi) All are plant derived alkaloids except :

- (a) Menthol
- (b) Nicotine
- (c) Quinine
- (d) Codeine

(xii) Elicitor are molecules that :

- (a) Induce cell division
- (b) Stimulate production of secondary metabolites
- (c) Stimulate hairy root formation
- (d) None of the above

## SECTION-B

### ( Very Short Answer Type Questions )

**Note :** Attempt **any five** questions. Each question carries **2** marks. (Word limit **25-30** words) [5x2=10]

2. (i) Define micropropagation.
- (ii) What is Callus culture ?
- (iii) Define 'Somaclonal variation'.
- (iv) Name four enzymes used in plant genetic engineering.
- (v) What is Gene editing ?
- (vi) What is Edible vaccine ?
- (vii) What is Somatic hybridization ?

## SECTION-C

### ( Short Answer Type Questions )

**Note :** Attempt **any five** questions. Each question carries **4** marks. (Word limit **250** words) [5x4=20]

3. (i) Describe somatic embryogenesis.
- (ii) Explain Haploid and double haploid production.
- (iii) Describe chloroplast transformation.
- (iv) Describe Biofarming.
- (v) Describe DNA sequencing.
- (vi) What is Genomic DNA library ? Explain.
- (vii) Explain CRISPR Cas 9 mediated genome editing.

### **SECTION-D**

#### **( Essay Type Questions )**

**Note :** Attempt **any three** questions. Each question carries **10** marks. (Word limit **500** words) [3x10=30]

4. (i) What is plant tissue culture ? Explain laboratory organization and sterilization in detail.
- (ii) Explain DNA banking and cryopreservation in detail.
- (iii) Write the difference between Ti and Ri plasmid and explain Agrobacterium mediated transformation.

- (iv) Describe plant genetic engineering with special reference to enzymes used.
- (v) What is Biotic and Abiotic stress ? Explain stress tolerance mechanism.

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