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B. Sc. (Biotechnology) Part - III Examination, 2015

BIOTECHNOLOGY

Paper : X

(Plant Biotechnology)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt *all* questions from *Section-A* (Objective type questions), *seven* questions from *Section-B* (Short answer type questions) and *two* questions from *Section-C* (Long/Essay type questions).

SECTION – A [Marks : 10 × 1 = 10

1. Plant biotechnology involves :
   (a) Production of virus free plants
   (b) Rapid clonal multiplication of desired genotypes
   (c) Production of valuable products in plants
   (d) All of these

2. Cybrids are :
   (a) Nuclear hybrids
   (b) Cytoplasmic hybrids
   (c) Hybrid plants derived from cross pollination
   (d) Cytological hybrids

3. Haploid plants are produced in large number by :
   (a) ovary culture
   (b) another culture
   (c) both (a) and (b)
   (d) embryo culture

4. The variation in *invitro* culture is called as :
   (a) invitro variation
   (b) mutation
   (c) somaclonal variation
   (d) all of these

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5. Which of the agricultural challenges below cannot be solved with transgenic technique ?
   (a) crops are killed by a virus
   (b) crops are damaged by frost
   (c) Public preference for organic vegetables
   (d) Public concern about safety of synthetic pesticide

6. Which of the following plant cell will show totipotency ?
   (a) Xylem vessels (b) Sieve tube
   (c) Meristem (d) Cork cells

7. Transgenic plants :
   (a) contain foreign genes in their cells
   (b) are used to produce human antibodies
   (c) both (a) and (b)
   (d) are plants that differ in geographical location

8. The most widely used chemical for protoplast fusion as fusogens, is :
   (a) Manitol (b) Sorbitol
   (c) Marinol (d) PEG

9. Which cell based plant technique involves the combining of two cells with out cell walls from different species ?
   (a) Clonal propagation (b) Protoplast culture
   (c) Cybridization (d) Mutant selection

10. Plants containing genes encoding cytokines and blood clothing factors are used in :
   (a) Nutrition improvement (b) Pharmaceutical production
   (c) Vaccine production (d) Textile production

SECTION – B

[Marks : 7 × 5 = 35

1. Write a short note on endosperm culture.

2. Give a brief account of short tip culture and its application.

3. Explain chemical methods of protoplast fusion.

4. Briefly explain edible vaccines.

5. Describe somatic hybridization and its applications.

6. Give the practical applications of Tissue Culture.

7. Explain how embryo rescue can be used to produce novel hybrids ?

8. What is T-DNA ? Give the structural organization of T-DNA.

9. What is the common strategy to produce transgenic crops with delayed ripening and longer shelf life of fruits ?

10. Explain the role of growth hormones in plant tissue culture.

SECTION – C

[Marks : 15 × 2 = 30

1. Write an essay on Micropropagation.

2. Write short note on :
   (a) Use of markers for selection of hybrid cells.
   (b) Practical application of hybridization.
   (c) Totipotency.

3. *Agrobacterium tumefaciens* is known as "Natural genetic engineer of plants." Justify the statement and explain its complete procedure.

4. How can we produce transgenic plants ? Explain one example of herbicide resistant and one examples of stress tolerant transgenic plant.