2022

(CBCS)

(6th Semester)

BOTANY

TWELFTH PAPER

(Plant Biotechnology and Experimental Embryology)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. pBR322 is an example of a
- *(a)* cosmid vector ( )
- *(b)* plasmid vector ( )
- *(c)* phagemid vector ( )
- *(d)* YAC ( )

2. Broken phosphodiester bonds in DNA can be repaired by the enzyme
- *(a)* DNA methylase transferase ( )
- *(b)* DNA ligase ( )
- *(c)* EcoR1 ( )
- *(d)* *Taq* polymerase ( )

3. The T-DNA region of a Ti plasmid of *Agrobacterium tumefaciens* is flanked by the
- *(a)* *ori* region ( )
- *(b)* *vir* region ( )
- *(c)* opine biosynthesis region ( )
- *(d)* border repeats ( )

4. A gene transfer method invented by J. Sanford *et. al.* is

(a) gene gun method ( )

(b) microinjection ( )

(c) micropropagation ( )

(d) polymerase chain reaction ( )

5. In a plant tissue culture medium, agar-agar is used to

(a) stabilize the medium ( )

(b) sterilize the medium ( )

(c) solidify the medium ( )

(d) adjust the pH of the medium ( )

6. The tissue obtained from a plant to be cultured is called

(a) cybrid ( ) *(b)* hybrid ( )

(c) explant ( ) *(d)* somatic embryo ( )

7. A plantibody is

(a) an animal antibody produced by plants ( )

(b) a plant antibody produced by animals ( )

(c) a plant antibody produced by plants ( )

(d) a plant antibody produced by microorganisms ( )

8. The genetically engineered Flavr Savr tomato has the trait for

(a) insect resistance ( ) *(b)* frost resistance ( )

(c) high yield ( ) *(d)* delayed ripening ( )

9. Cybrids are hybrids that have

(a) nucleus and cytoplasm from both parents ( )

(b) nucleus from one parent and cytoplasm from both parents ( )

(c) nucleus from both parents and cytoplasm from one parent ( )

(d) no nucleus only cytoplasm from both parents ( )

10. The tendency of protoplast to burst in culture can be prevented by adding a suitable

(a) fusogen ( ) *(b)* cryoprotectant ( )

(c) osmoticum ( ) *(d)* growth regulator ( )

(SECTION : B—SHORT NOTE)

(*Marks* : 15)

Write short notes on the following : 3×5=15

UNIT—I

1. DNA amplification by PCR

OR

2. Cloning vectors

UNIT—II

3. Reporter gene

OR

4. Significance of enzymes in molecular cloning

UNIT—III

5. Cryoprotectant

OR

6. Any two sterilization methods used in tissue culture

UNIT—IV

7. Transgenic tomato

OR

8. Bt cotton

UNIT—V

9. Cybridization

OR

10. Protoplast fusion

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer the following questions : 10×5=50

UNIT—I

1. Give an account of restriction enzymes. Mention the different types and its significance in genetic engineering. 10

OR

2. Write short notes on the following : 5+5=10

(a) Methylase

(b) Recombinant DNA

UNIT—II

3. What are transgenic plants? How are such plants produced? 2+8=10

OR

4. Briefly describe the following : 5+5=10

(a) Gene gun

(b) *Agrobacterium* : Nature's genetic engineer

UNIT—III

5. Describe the major components of a nutrient medium. 10

OR

6. Write short notes on the following : 5+5=10

(a) Synthetic seeds

(b) Plant cell culture

UNIT—IV

7. Give an account of genetically engineered plantibodies and its advantages. 10

OR

8. Briefly describe the following : 5+5=10

(a) Golden rice

(b) Biotechnology in agriculture

UNIT—V

9. What is micropropagation? Describe the method and significance of micropropagation. 2+8=10

OR

10. Write short notes on the following : 5+5=10

(a) Protoplast isolation

(b) Embryo culture

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