

2014

(6th Semester)

BOTANY

TWELFTH PAPER

(Plant Biotechnology and Experimental Embryology)

Full Marks : 55

Time : 2 hours

(PART : B—DESCRIPTIVE)

(Marks : 35)

The figures in the margin indicate full marks for the questions

Answer all questions

1. Describe the techniques of plant tissue culture. 7

Or

Write on the following :

(a) Basic steps of PCR

(b) Recombinant DNA

14G—300/576a

(Turn Over)

2. Describe briefly the production of transgenic plants and discuss their applications. 7

Or

Write notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Agrobacterium-mediated transformation
(b) Gene gun

3. Define cryopreservation. Describe the procedure of cryopreservation of plant cells. 7

Or

Write notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Media sterilization
(b) Totipotency

4. Describe various uses of biotechnological tools in the field of agriculture. 7

Or

Write notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$

- (a) Bt cotton
(b) GM crop

5. What is somatic embryo? Describe the developmental patterns of somatic embryos. 7

Or

Write notes on the following :

$3\frac{1}{2}+3\frac{1}{2}=7$

(a) Protoplast fusion

(b) Hybrid vigour

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(PART : A—OBJECTIVE)

(Marks : 20)

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Answer **all** questions

SECTION—A

(Marks : 5)

1. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

(a) A DNA molecule that has the ability to replicate in an appropriate host cell, and into which the DNA fragment to be cloned is integrated for cloning, is

(i) recombinant DNA ()

(ii) vector ()

(iii) reported gene ()

(iv) transgene ()

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(PART : A—OBJECTIVE)

(Marks : 20)

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Answer **all** questions

SECTION—A

(Marks : 5)

1. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

(a) A DNA molecule that has the ability to replicate in an appropriate host cell, and into which the DNA fragment to be cloned is integrated for cloning, is

(i) recombinant DNA ()

(ii) vector ()

(iii) reported gene ()

(iv) transgene ()

(2)

(b) Insect-resistant plant containing a gene from the bacterium *Bacillus thuringiensis* is known as

(i) crystal (cry) protein ()

(ii) restriction endonuclease ()

(iii) chimaeric gene ()

(iv) antisense gene ()

(c) The gel used for encapsulating the somatic embryos to produce synthetic seeds, is

(i) agar-agar ()

(ii) sodium alginates ()

(iii) calcium chloride ()

(iv) None of the above ()

VI/BOT (xii)/576

(3)

(d) Golden rice is rich in

- (i) vitamin A ()
- (ii) vitamin B ()
- (iii) vitamin C ()
- (iv) vitamin D ()

(e) A cell or plant containing nucleus of one species but cytoplasm from both the parental species is

- (i) hybrid ()
- (ii) cybrid ()
- (iii) somatic cell ()
- (iv) zygotic cell ()

(4)

SECTION—B
(Marks : 15)

3×5=15

2. Write notes on the following :

(a) Ligases

VI/BOT (xii)/576

(5)

(b) Agrobacterium

(6)

(c) Explants

VI/BOT (xii)/576

(A) Plantibodies

(8)

(e) Micropropagation

14G—300/576

VI/BOT (xii)