

- (d) Anther culture. 4
- (e) Triploid production and Endosperm culture. 4
- (f) Somaclonal variation. 4
6. Explain :
- (a) Active transport. 4
- (b) Protoplasmic membrane. 4
- (c) Protoplast isolation methods. 4

OR

- (d) Applications of single cell suspension culture. 4
- (e) Osmosis and diffusion. 4
- (f) Regeneration of protoplast. 4

7. Describe :

- (a) Electroporation method of gene transfer. 4
- (b) Cybrids. 4
- (c) Markers for selecting hybrids. 4

OR

- (d) Agrobacterium mediated gene transfer schematic representation. 4
- (e) Somatic hybridization. 4
- (f) Applications of transformation of plants. 4

**B.Sc. (Part-III) Semester-VI Examination****6S : BIOTECHNOLOGY (R/V)****(Plant Biotechnology)**

Time : Three Hours]

[Maximum Marks : 80

**Note :—** (1) **ALL** questions are compulsory.  
 (2) Draw well labelled diagram wherever necessary.

1. (a) Fill in the blanks :

- (i) Absorption of minerals in plants against concentration gradient is \_\_\_\_\_.
- (ii) The response of plants to the photoperiod expressed in the form of flowering is called as \_\_\_\_\_.
- (iii) \_\_\_\_\_ first isolated growth substance from Avena coleoptile tips.
- (iv) \_\_\_\_\_ is responsible for the phenomenon of geotropism in plants. ( $\frac{1}{2} \times 4 = 2$ )

(b) Multiple choice questions.

- (i) Apical dominance phenomena was first observed by :  
 (a) Murashige and Skoog  
 (b) Thimann and Skoog

- (c) Charles Darwin  
(d) Haberland
- (ii) Ovary culture is used for production of \_\_\_\_\_.  
(a) Meristems  
(b) Protoplast culture  
(c) Haploids  
(d) Suspension culture
- (iii) \_\_\_\_\_ is also known as shooting hormone.  
(a) Auxin  
(b) Cytokinin  
(c) Gibberellins  
(d) Ethylene
- (iv) \_\_\_\_\_ is the soil bacterium used of genetic transformation of plants.

- (a) Staphylococcus  
(b) Agrobacterium  
(c) Azotobacter  
(d) Rhizobium

$(\frac{1}{2} \times 4) = 2$

(c) Answer in **one** sentence :

- (i) Define transformation.  
(ii) Embryo rescue.  
(iii) Role of auxins in plant growth.  
(iv) Define osmosis.

$1 \times 4 = 4$

2. Describe the effects of different environmental factors on plant growth with an example. 12

**OR**

Explain in details different methods of measuring growth in plants. 12

3. Explain in brief :

- (a) Physiological effects of Auxin. 4  
(b) Hormone concept. 4  
(c) Physiological effects of gibberellins. 4

**OR**

- (d) Use of growth hormone in horticulture. 4  
(e) Physiological effects of cytokinin. 4  
(f) Mechanism of action of growth substance. 4

4. Describe in detail design and management of typical tissue culture laboratory. 12

**OR**

Explain in detail the preparation of MS medium and its composition. Add a note on precaution. 12

5. Describe :

- (a) Micropropagation. 4  
(b) Induction of callus. 4  
(c) Ovule culture. 4

**OR**