

**BOT–554****Plant Molecular Biology and Biotechnology**

M. Sc. BOTANY (MSCBOT–12/13/16)

Second Year, Examination, 2017

**Time : 3 Hours**

**Max. Marks : 80**

**Note :** This paper is of **eighty (80)** marks containing **three (03)** Sections A, B and C. Learners are required to attempt the questions contained in these Sections according to the detailed instructions given therein.

**Section–A****(Long Answer Type Questions)**

**Note :** Section ‘A’ contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer *two* (02) questions only.

1. Explain in detail about mitochondrial and chloroplastic genome organization and regulation of gene expression.
2. Explain different enzymes used in molecular cloning. What are the modified enzymes used in RDT ?
3. Describe the technique used in protoplast culture. What are the factors affecting the protoplast and its viability ?
4. Discuss in detail plant genomics and proteomics.

**Section-B****(Short Answer Type Questions)**

**Note :** Section 'B' contains eight (08) short answer type questions of eight (08) marks each. Learners are required to answer *four* (04) questions only.

1. Discuss the basic principle and steps of RFLP marker. Write down its advantages and disadvantages.
2. Explain restriction endonucleases and their importance in genetic engineering.
3. Discuss about Bt toxin as biopesticide.
4. Describe in brief various steps of Polymerase Chain Reaction (PCR).
5. Do GM crops cause damage to the environment ? Give your opinion.
6. Give a brief account on pollen culture.
7. Discuss the applications of transgenic plants in detail.
8. Give an account of Cryopreservation of plant cells and tissues.

**Section-C****(Objective Type Questions)**

**Note :** Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this Section are compulsory.

Indicate whether the following statements are True *or* False :

1. Biopatents are rights to use biological entities.

(True/False)

2. Callus is an unorganised actively dividing mass of cells maintained in culture. (True/False)

Choose the correct answer :

3. All are plant derived alkaloids except :
- (i) Menthol
  - (ii) Nicotine
  - (iii) Quinine
  - (iv) Codeine
4. Which vector/bacterium is mostly used in crop improvement ?
- (i) Plasmid
  - (ii) Cosmid
  - (iii) Phasmid
  - (iv) Agrobacterium
5. The basic requirements of PCR reaction is :
- (i) DNA segment to be amplified
  - (ii) Two oligonucleotide primers
  - (iii) A heat stable DNA polymerase
  - (iv) All of the above
6. All are plant derived elicitors except :
- (i) Chitin
  - (ii) Pectin
  - (iii) Cellulose
  - (iv) Pectic acid
7. Which method is best suited for production of virus free plants ?
- (i) Anther culture
  - (ii) Pollen culture
  - (iii) Meristem culture
  - (iv) Protoplast culture

8. Growth hormone producing apical dominance in :
  - (i) Auxin
  - (ii) Gibberellin
  - (iii) Ethylene
  - (iv) Cytokinin
9. Cybrids are :
  - (i) A nuclear hybrid
  - (ii) Hybrid plants derived from cross pollination
  - (iii) Cytoplasmic hybrids
  - (iv) Cytological hybrids
10. The enzymes required to obtain naked protoplast are :
  - (i) Cellulase and Proteinase
  - (ii) Cellulase and Pectinase
  - (iii) Cellulase and Amylase
  - (iv) Amylase and Pectinase