Roll No. ……..

BOT–554

Plant Molecular Biology and Biotechnology

M. Sc. BOTANY (MSCBOT–12/13/16/17)

Second Year, Examination, 2018

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. Gene expression can be regulated at several levels. Explain.
2. What is molecular marker ? How do physical maps differ from genetic maps, why ? Describe briefly methods for physical mapping of molecular markers or DNA sequences.
3. What is PCR technology ? Describe the different PCR based molecular markers which employ arbitrary or random primer. What are its applications ?
4. Discuss in detail about transgenic plant. How do you create a transgenic plant ? What are the benefits of using transgenic plants ?

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. What do you mean by biosafety ? Why is there a need of biosafety ?
2. What is a Proteome and how is the link between an organism's genome and a proteome ?
3. Write a brief note on restriction enzymes.
4. Write a note on mitochondrial genomes.
5. What do you know about copyrights ?
6. Write a short note on Bt Cotton.
7. What is C-value paradox ?
8. Describe briefly about genomic libraries.

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.

Choose the correct alternative :

1. RNA i stand for :
   (a) RNA indicar
   (b) RNA interference
   (c) RNA intron
   (d) RNA insertion

2. Control of gene expression in eukaryotes includes all of the following except :
   (a) Alternative RNA splicing
   (b) Binding of proteins to DNA
   (c) Transcription factors
   (d) Stabilization of *m*-RNA by *mi*-RNA

3. Agrobacterium is a :
   (a) Bacteria
   (b) Virus
   (c) Fungi
   (d) None of the above

4. NIPGR is located at :
   (a) Lucknow
   (b) Kolkata
   (c) New Delhi
   (d) Dehradun

5. T-DNA is found in :
   (a) Agrobacterium
   (b) Rhizobium
   (c) Bacteriophage
   (d) Bacillus

6. Haploid plants are produced in large numbers by :
   (a) Anther culture
   (b) Ovary culture
   (c) Both (a) and (b)
   (d) Embryo culture

7. Somatic hybridization is achieved through :
   (a) Grafting
   (b) Protoplast fusion
   (c) Conjugation
   (d) Recombinant DNA technology

8. ..... is the enzyme that binds adjacent Okazaki fragments on the lagging strand.
   (a) Helicase
   (b) DNA ligase
   (c) DNA polymerase I
   (d) Gyrase

9. The plasmid used by Cohen and Boyer for their transformation experiment was :
   (a) pSC 101
   (b) pUC 17
   (c) pBR 322
   (d) *E. coli* plasmids

10. In plant tissue culture, which of the following shows totipotency ?
   (a) Meristem
   (b) Sieve tube
   (c) Xylem vessel
   (d) Collenchyma