

**G-3/357/22**

Roll No. ....

**III Semester Examination, January 2022**

**M.Sc.**

**BOTANY**

Paper III

(Biotechnology-I)

Time : 3 Hours ]

[ Max. Marks : 80

**Note :** *All questions are compulsory. Question Paper comprises of 3 Sections. Section A is objective type/multiple choice questions with no internal choice. Section B is short answer type with internal choice. Section C is long answer type with internal choice.*

**SECTION A**

**1×8=8**

**(Objective Type/Multiple Choice Questions)**

*Choose the correct answer :*

1. Taq polymerases :
  - (a) Removes phosphate from 5' end of DNA
  - (b) Digests nucleotide from 5' end of DNA
  - (c) Heat liable DNA polymerase
  - (d) Heat stable DNA polymerase

P.T.O.

2. Self replicating DNA molecule used for transfer of foreign DNA fragments between cell is :
- (a) Probe                      (b) Primer  
(c) Vector                      (d) Master gene
3. Which one of the following is the approach for strain improvement in industrial microbes ?
- (a) Mutant selection  
(b) Recombination  
(c) Recombinant DNA technology  
(d) All of the above
4. *npt II*, *spt*, *tac* *z* are :
- (a) Promotor sites      (b) Marker genes  
(c) Regulator sites      (d) Restriction sites
5. In pyrosequencing visible light is :
- (a) Proportional to the number of incorporated nucleotides  
(b) Inversely proportional to the number of incorporated nucleotides  
(c) No visible is seen  
(d) Has no correlation with the incorporation of nucleotides

6. The sequence of events in PCR (Polmerase chain reaction) is :
- (a) (i) Extention, (ii) Denaturation, (iii) Annealing  
(b) (i) Denaturation, (ii) Annealing, (iii) Extension  
(c) (i) Annealing, (ii) Denaturation, (iii) Extension  
(d) (i) Extention, (ii) Annealing, (iii) Denaturation
7. DNA markers used in mapping are :
- (a) RFLP                      (b) SSLP  
(c) SNP                      (d) All of these
8. A pattern of ssDNA probe immobilized on a chip or a slide is called :
- (a) Southern blotting  
(b) Northern blotting  
(c) Microarray  
(d) Replica plating

**SECTION B****4×6=24****(Short Answer Type Questions)****Note : Answer the following questions in 250 words.****Unit-I**

1. Explain with example the properties of expression vectors.

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*Or*

Explain bacteriophage vectors.

### Unit-II

2. Give the method of camv mediated gene transfer.

*Or*

Explain replica plating method of selection of recombinants.

### Unit-III

3. Explain nested PCR and its applications.

*Or*

Explain pyrosequencing method of DNA sequencing.

### Unit-IV

4. Explain human genome project.

*Or*

Give the types of databases used in bio-informatics.

### SECTION C

4×12=48

(Long Answer Type Questions)

**Note :** Answer the following questions in 500 words.

### Unit-I

1. Describe various steps involved in construction of cDNA library.

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*Or*

Describe the properties of shuttle vectors with examples.

### Unit-II

2. Describe methods of vectorless or direct DNA transfer.

*Or*

Describe the methods of genetic improvement of industrial microbes.

### Unit-III

3. Describe methods of chemical synthesis of gene.

*Or*

Explain various steps involved in DNA fingerprinting, give its applications.

### Unit-IV

4. Describe method and significance of gene mapping.

*Or*

Describe different types of protein-protein interaction.

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