

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 763 E Your Roll No.....

Unique Paper Code : 216605

Name of the Course : B.Sc. (H) Botany

Name of the Paper : Plant Biotechnology [BTHT-612]

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt five questions in all.
3. Question No. 1 is compulsory.

1. (a) Name the technique used to : (5)

- (i) Amplify single molecule of DNA
- (ii) Confirm the identity of criminals
- (iii) Detect specific DNA fragment in a DNA sample
- (iv) Localize specific DNA sequences on chromosomes
- (v) Separate molecules on the basis of charge/mass ratio.

(b) Expand the following abbreviations : (5)

- (i) pBR
- (ii) ARS

P.T.O.

- (iii) MAC
- (iv) RT-PCR
- (v) SDS

(c) Match the following : (5)

- |                                    |                               |
|------------------------------------|-------------------------------|
| (i) Golden rice                    | (a) Stanley Cohen & Paul Berg |
| (ii) cDNA                          | (b) Kary Mullis               |
| (iii) Restriction Endonucleases    | (c) Ingo Potrykus             |
| (iv) PCR                           | (d) Reverse transcriptase     |
| (v) First recombinant DNA molecule | (e) H. Smith & D. Nathans     |

2. (a) Briefly explain the following terms : (10)

- (i) Androgenesis
- (ii) Antisense RNA
- (iii) Totipotency
- (iv) Multiple cloning site
- (v) Phagemid

(b) What are reporter genes ? Discuss with one example their role in production of transgenic plants. (5)

3. Write short notes on any three : (3×5=15)

- (i) Cryopreservation

- (ii) Plantibodies
  - (iii) Glyphosate resistant plants
  - (iv) Protoplast isolation, culture and fusion
4. Differentiate between any five : (5×3=15)
- (i) Plasmid and cosmid
  - (ii) RAPD and RFLP
  - (iii) Southern blotting and western blotting
  - (iv) Organogenesis and somatic embryogenesis
  - (v) Cloning vector and expression vector
  - (vi) Type I and Type II restriction endonucleases
5. (a) With the help of illustration, describe the structure of Ti plasmid. Explain how *Agrobacterium*- mediated transformation is achieved using the binary vector or cointegrate vector approach. (4+6=10)
- (b) Discuss the role of plasmids as vectors in cloning. (5)
6. (a) Describe the technique of DNA fingerprinting and its applications. (10)
- (b) Discuss the role of transgenics in degradation of pollutants. (5)
7. (a) Explain the technique of gel electrophoresis. Differentiate between AGE and PAGE. (7)

- (b) What are various methods by which a gene of interest can be obtained for genetic engineering ? (6)
- (c) Name four components which are absolutely essential in a PCR mixture. (2)