

Roll No. ....

Total Pages : 3

**MDE/D-23**

**4432**

## **CYTOGENETICS & PLANT BREEDING**

Paper–BOT–103

Time Allowed : 3 Hours]

[Maximum Marks : 80

**Note** : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

### **Compulsory Question**

1. Answer the following questions :  $8 \times 2 = 16$

- (a) What do you understand by euchromatin?
- (b) What are Sex chromosomes?
- (c) What are CDKs?
- (d) What is the importance of two point test cross?
- (e) What do you understand by dosage compensation?
- (f) What are the genetic consequences of chromosomal inversions?
- (g) What is Trisomy?
- (h) Explain heterosis.

### **UNIT-I**

2. Write an explanatory note on the following :

- (a) Chromosome structure. 8
  - (b) Heterochromatin. 4
  - (c) Mitochondrial genome. 4
3. Explain the following :
- (a) Polytene chromosomes. 3
  - (b) B-chromosomes. 4
  - (c) Karyotype analysis. 5
  - (d) Flow cytometry. 4

### **UNIT-II**

4. Explain the following :

- (a) Regulation of the cell cycle. 10
- (b) G-banding. 6

5. Write notes on the following :

- (a) Linkage. 5
- (b) Holliday Junction. 6
- (c) Three point test cross. 5

### **UNIT–III**

6. Explain the following :
- (a) Sex determination in animals. 4
  - (b) Origin and Meiosis in cells showing chromosomal duplications. 6
  - (c) Meiosis in cells showing chromosomal translocations. 6
7. Explain the origin, production, effects and uses of haploids and allopolyploids. 16

### **UNIT–IV**

8. Write notes on the following :
- (a) Hybridization. 4
  - (b) Breeding in vegetatively propagated crops. 6
  - (c) Direct gene transfer. 6
9. What do you understand by male sterility? Explain the different types and inheritance patterns. 16