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Roll No.

B.Sc. (Bio-Tech.)-I Year

**NS-3459**

**B.Sc. (Bio-Tech.) Examination,**

**June-2023**

**GENETICS**

**(B-105)**

**(B.Sc. Biotech.)**

*Time : Three Hours*

*[Maximum Marks : 50*

**Note :** Attempt any five questions. All questions carry equal marks..

1. What is transformation ? How are linkage maps prepared in bacteria through transformation ? 10
2. Differentiate between the following :  $4 \times 2\frac{1}{2} = 10$ 
  - (a) Test cross and Back cross
  - (b) Crossing-over and translocation

- (c) Euchromatin and Heterochromatin
- (d) Multiple alleles and Multiple factors

3. What is sex determination and sex differentiation ? Discuss the chromosome theory of sex determination. 10

4. Write short notes on the following :  $4 \times 2\frac{1}{2} = 10$

- (a) t-test
- (b) Chromosome banding
- (c) Polytene chromosome
- (d) Down syndrome

5. What are multiple alleles ? Discuss the multiple alleles for coat colour in rabbits and self-incompatibility in Nicotiana. 10

6. Write detailed note on :  $2 \times 5 = 10$

- (a) Dosage Compensation
- (b) Epistatic gene action

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7. What is chromosome ? Describe the supersolenoid or coiled-coil model of chromosome structure. 10
8. Write detailed note on : 3+3+4
- (a) Conjugation
  - (b) Sex determination in plants
  - (c) Hardy-Weinberg law
9. What are induced mutations ? Discuss the significance of induced mutations in plants. 10
10. What is extra-chromosomal inheritance ? Discuss the cytoplasmic inheritance through plastid inheritance in *Mirabilis jalapa*. 10