

**NS-3459(N)**

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

**June-2022**

**Genetics**

**(B-105)**

**(New)**

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

**Time : Three Hours ]**

**[Maximum Marks : 50**

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

1. Why Mendel selected pea plant for his study? Discuss the law of independent assortment in detail. 10

**P.T.O.**

2. Write detailed note on the following:

5 each

- (a) Classical and modern concept of gene  
(b) Mitochondrial and chloroplast genetic systems

3. What are chromosomal aberrations? Discuss the meiosis in a translocation heterozygote and write the different types of gametes expected. Also give suitable sketches. 10

4. Write short note on the following: 3+4+3  
(a) Paracentric and pericentric inversion  
(b) Klinefelter and Turner syndrome  
(c) Position effect

5. What are transformation and transduction? Discuss how these are used in genetic mapping. 10

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6. What do you understand by extra-nuclear inheritance. Discuss the cytoplasmic inheritance giving the example of kappa particles in paramecium and plastid inheritance in Mirabilis. 10

7. Differentiate between the following:

2½ each

- (a) Autopolyploidy and allopolyploidy
- (b) Euchromatin and heterochromatin
- (c) Spontaneous and induced mutations
- (d) Test cross and back cross

8. Give in brief the classification of numerical changes in chromosome.

Discuss aneuploidy in detail. 10

9. Write in detail about: 5 each

- (a) Evolution of wheat
- (b) Structural organization of chromosome

10. Define sex differentiation and sex determination. Discuss the genic balance theory of sex determination in Drosophila. 10