(M) Lib, 16-12-19

[This question paper contains 6 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7385 **J**

Unique Paper Code : 32161303

Name of the Paper : Genetics

Name of the Course : **B.Sc. (Hons.) Botany**

Semester : III

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) Give contributions of the following scientists **(any 5)** : (1×5)

   (i) Nilsson-Ehle

   (ii) R. C. Punnett

P.T.O.

(iii) L. Cuenot

(iv) H. J. Muller

(v) Hugo de Vries, K. Correns, E. Tschermark

(vi) S. Benzer

(b) Define the following terms **(any 5)** : (1×5)

(i) Holandric genes

(ii) Allele

(iii) Chi-square test

(iv) Recon

(v) Karyotype

(vi) Allopatric speciation

(c) Expand the following **(any 5)** : (1×5)

(i) SRY

(ii) QTL

(iii) 5-BU

(iv) F1

(v) NTG

(vi) cM

2. Write short notes on the following **(any 3)** : (5×3)

(a) Multiple Alleles

(b) ClB experiment

(c) Cis-trans complementation test

(d) Kappa particle inheritance in *Paramecium*

3. Differentiate between the following **(any 3)** : (5×3)

(a) Physical and Chemical mutagen

(b) Euploidy and Aneuploidy

(c) Dominance and Epistasis

(d) Continuous and discontinuous variations

4. (a) Explain Hardy-Weinberg Law with an example. (8)

(b) Discuss maternal influence with the help of an example. (7)

5. (a) Describe pre-zygotic and post-zygotic mechanisms of reproductive isolation in Angiosperms. (8)

(b) What do you understand by expressivity and penetrance? (5)

(c) Explain test cross. (2)

6. (a) Explain lethal alleles and their inheritance with examples. (6)

(b) What is chromosomal inversion? Discuss its consequence during gamete formation. (9)

7. (a) In *Drosophila,* Lyra *(Ly)* and Stubble *(Sb)* are dominant mutations located on two separate loci on chromosome 3. A recessive mutation with bright red eyes was also shown to be on chromosome 3. Progeny is obtained by crossing a female who is heterozygous for all three mutations to a male homozygous for bright red mutation (*br*). The

following data is generated :

Phenotype	Number
Ly Sb br	404
+ + +	422
Ly + +	18
+ *Sb br*	16
Ly + *br*	75
+ *Sb* +	59
Ly Sb +	4
+ + *br*	2

(i) Calculate Non crossover, Single crossover and Double crossover frequencies. (6)

(ii) Determine the correct gene sequence and the map distance between each loci. (3)

(iii) Calculate Coefficient of coincidence (C) and Interference (I). (3)

P.T.O.

(b) Explain genetic drift and its implications. (3)