

6/H-62 (vii) (Syllabus-2015)

2 0 2 3

(May/June)

BOTANY

(Honours)

(Genetics, Plant Breeding and Molecular Biology)

(BOTELH-601)

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer **five** questions in which Q. No. 1 is compulsory.

Answer the remaining **four** questions,
selecting **one** from each Section

1. Write short notes on the following : $4 \times 4 = 16$

- (a) Law of segregation
- (b) Chromosomal duplication
- (c) Pureline selection
- (d) Cloverleaf model of t-RNA

SECTION—I

2. With the help of suitable diagrams, give an account of the structure of eukaryotic chromosomes. Describe their role in inheritance. 7+3=10
3. Differentiate between the following : 5+5=10
- (a) Supplementary and Complementary gene interactions
- (b) Linkage and Crossing-over

SECTION—II

4. What is extranuclear inheritance? Explain in detail the phenomenon of cytoplasmic inheritance in variegated leaves of *Mirabilis*. 2+8=10
5. Write short notes on the following : 5+5=10
- (a) Sex determination in *Melandrium*
- (b) Different kinds of polyploids

SECTION—III

6. Describe the procedure involved in hybridization of cross-pollinated crops. Mention its importance in crop improvement. 7+3=10

7. Explain the following : 5+5=10
- (a) Heterosis and inbreeding depression
- (b) Role of gene mutation in evolution

SECTION—IV

8. What is semi-conservative replication? Describe the mechanism of DNA replication. 2+8=10
9. Write short notes on the following : 5+5=10
- (a) Inducible and repressible operons
- (b) Bacterial conjugation
