BOTANY Paper–B

(Genetics)

Time Allowed : 3 Hours **Max. Marks : 36**

Note: Attempt **five** questions in all. Question No. **1** is compulsory and select **one** question from each unit.

1. (a) MCQ's (Choose the right answer) :

(i) Genotypic ratio of monohybrid cross is :

(a) 2 : 2 (b) 1 : 2 : 1

(b) 1 : 1 (d) 9 : 3 : 3 : 1

(ii) Which of the following is not category of Chemical mutagen ?

(a) Base modifying (b) Base analogue

(c) Intercalating compound

(d) Ionising radiations

(iii) Chromosomal theory of inheritance was proposed by :

(a) Mendel (b) Morgan

(c) Sutton and Boveri (d) Bridges

(iv) Karyotype of *Drosophila* has following pair of chromosomes :

(a) 4 (b) 8

(c) 23 (d) 10

(v) Mutagenic effect of X-ray was first observed by:

(a) Morgan (b) Beadle

(c) Muller (d) De Vries

(vi) Which of the following is an example of co-dominance ?

(a) Flower colour in *Lathyrus*

(b) Fur colour in mice

(c) Hair colour in cattle

(d) ABO blood group in man

(b) Fill up :

(vii) ..... is a replacement of purine with pyrimidine of vice-versa in DNA.

(viii) The phenomenon of masking of expression of a gene by another non-allelic gene is called ..... .

(ix) Genes present on the Y-chromosomes are called .....

(x) Mendelian factors are called as ..... .

(xi) ..... blood group individuals are called universal donors.

(xii) F_2 ratio of 12 : 3 : 1 indicates ..... . $1 \times 12 = 12$

Uhit – I

2. State and explain Mendel's law of segregation with example. 6

3. Differentiate between :
   (a) Dominant and recessive gene
   (b) Homozygote and heterozygote. 3, 3

Unit – II

4. Write notes on :
   (a) Quantitative and qualitative inheritance
   (b) Dominance and Epistasis. 3, 3

5. What are supplementary genes ? Explain with example. 6

Unit – III

6. Explain chromosomal theory of inheritance in detail. 6

7. Differentiate between nuclear and extranuclear inheritance with examples. 6

Unit – IV

8. What are gene mutations ? Give mechanism of it. 6

9. Write notes on (any **two**) :
   (a) DNA damage and repair
   (b) Prototroph and auxotroph
   (c) Chemical mutagenes. 3, 3