

(i) Printed Pages : 4 Roll No. ....

(ii) Questions : 9 Sub. Code : 

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Exam. Code : 

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B.A./B.Sc. (General) 2nd Semester

1059

BOTANY

Paper-B : Genetics

Time Allowed : Three Hours] [Maximum Marks : 36

Note :— (1) Attempt *five* questions in all, selecting *one* question from each unit.

(2) Question No. I is compulsory.

I. (A) Choose the correct answer (MCQ's) :

(i) Phenotypic ratio of  $F_2$  generation of dihybrid cross is :

(a) 1 : 1 : 1 : 1 (b) 9 : 1 : 3 : 1

(c) 9 : 3 : 3 : 1 (d) 12 : 3 : 1 : 1

(ii) 15 : 1 ratio obtained during non-allelic gene interaction is an example of :

(a) Complementary gene

(b) Duplicate gene

(c) Supplementary gene

(d) Additive gene.

(iii) Direct transfer of sex-linked inheritance from male to male is called :

- (a) Holandric (b) Diandric  
(c) Hologenic (d) Diagenic

(iv) Plastids are absent in :

- (a) Green branches of *Mirabilis*  
(b) Female gametes  
(c) Male gametes  
(d) Variegated branches of *Mirabilis*.

(v) Which of the following is not a category of chemical mutagens ?

- (a) Base modifying  
(b) Base analogue  
(c) Intercalating compound  
(d) Ionising radiations.

(vi) The replacement of purine with pyrimidine or *vice versa* in DNA is known as :

- (a) Transition (b) Transversion  
(c) Frame-shift (d) Both (a) and (b)

(B) Fill in the blanks :—

(vii) Thymine dimers are produced by \_\_\_\_\_ .

(viii) The mutation which changes the reading of base sequence in a cistron is \_\_\_\_\_ .

(ix) UGA, a stop codon refers to \_\_\_\_\_ in mitochondria of animals and fungi.

(x) Haemophilia is genetically due to a recessive gene \_\_\_\_\_ carried by \_\_\_\_\_ chromosome.

(xi) The phenomenon of masking of expression of a gene by another non-allelic gene is \_\_\_\_\_.

(xii) Mendelian factor is now known as \_\_\_\_\_.

1×12=12

### UNIT—I

II. Differentiate between :

(a) Genotype and Phenotype.

(b) Complete and incomplete Linkage. 3,3

III. (a) State and explain Back Cross with example.

(b) What is linkage map ? Draw a linkage map for the genes with are having following recombination frequencies i.e. :

(i) Black body (b) and vestigial wing (vg) = 18%

(ii) Cinnabar eye (cn) and vestigial wing (vg) = 9.5 %

(iii) Black body (b) and Cinnabar eye (cn) = 9% 3,3

### UNIT—II

IV. Write notes on any **TWO** with example :—

(a) Duplicate gene

(b) Dominant epistasis

(c) Complementary gene 3,3

- V. What is allelic interaction ? Explain Incomplete Dominance and Codominance with suitable examples. 6

### UNIT—III

- VI. Write a note on Colour Blindness. Can women also develop this disorder ? Explain. 6
- VII. Discuss in detail the inheritance of plastid coloration in *Mirabilis jalapa*. 6

### UNIT—IV

- VIII. Differentiate between :—

- (a) Continuous and Discontinuous variations.
- (b) Transition, Transversion and Frame-Shift Mutation. 3,3

- IX. What are mutagens ? Explain Physical and Chemical mutagens. 6

### UNIT—II