

Chapter – 4 | Principles of Inheritance and Variation

QUIZ
PART-02

1. Hybridization between a pair of contrasting traits is called:

- A. Dihybrid cross B. Monohybrid cross
C. Test cross D. Mutation (B)

Explanation : A monohybrid cross involves inheritance study of one pair of contrasting traits.

2. In Mendel's experiment, tall and dwarf pea plants were crossed to study the inheritance of:

- A. Two genes
B. One gene
C. Multiple genes
D. Sex-linked genes (B)

Explanation : Mendel crossed tall and dwarf pea plants to study inheritance of a single gene controlling height.

3. In the F_1 generation of a cross between tall and dwarf pea plants, all plants were:

- A. Dwarf
B. Tall
C. Half tall and half dwarf
D. Intermediate height (B)

Explanation : The dominant tall trait appeared in all F_1 generation plants.

4. The phenotypic ratio obtained in the F_2 generation of a monohybrid cross is:

- A. 1 : 1 B. 9 : 3 : 3 : 1
C. 3 : 1 D. 1 : 2 : 1 (C)

Explanation : In a monohybrid cross, the F_2 generation shows a phenotypic ratio of 3 tall : 1 dwarf.

5. The genotypic ratio in the F_2 generation of a monohybrid cross is:

- A. 3 : 1
B. 1 : 2 : 1
C. 9 : 3 : 3 : 1
D. 1 : 1 (B)

Explanation : The genotypic ratio of $TT : Tt : tt$ in F_2 generation is 1 : 2 : 1.

6. The separation of alleles during gamete formation is known as:

- A. Mutation B. Segregation
C. Hybridization D. Fertilization (B)

Explanation : During meiosis, parental alleles separate or segregate and only one allele enters a gamete.

7. Punnett square was developed by:

- A. Gregor Mendel
B. Charles Darwin
C. Reginald C. Punnett
D. Watson (C)

Explanation : Reginald C. Punnett developed the Punnett square to predict possible genotypes of offspring.

8. A cross used to determine the genetic makeup of an organism is called:

- A. Monohybrid cross
B. Dihybrid cross
C. Test cross
D. Self-cross (C)

Explanation : A test cross is performed by crossing an organism with unknown genotype with a homozygous recessive parent.

9. If two heterozygous tall pea plants ($Tt \times Tt$) are self-crossed, the phenotypic ratio obtained is:

- A. All tall
B. 1 tall : 1 dwarf
C. 3 tall : 1 dwarf
D. 1 tall : 3 dwarf (C)

Explanation : $Tt \times Tt$ produces $TT, Tt, Tt,$ and tt , giving a phenotypic ratio of 3 tall : 1 dwarf.

10. In a test cross, the unknown dominant phenotype is crossed with:

- A. Homozygous dominant parent
B. Homozygous recessive parent
C. Heterozygous parent
D. Any hybrid parent (B)

Explanation : A test cross uses a homozygous recessive parent to identify the genotype of an organism showing a dominant trait.