

Chapter – 4 | Principles of Inheritance and Variation

QUIZ-01

1. Mendel conducted his hybridisation experiments on:

- A. Drosophila B. Garden pea
C. Snapdragon D. Maize (B)

Explanation : Mendel used garden pea plants because they had clear contrasting traits and true-breeding varieties.

2. In a monohybrid cross, the F_2 phenotypic ratio is:

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

Explanation : In Mendel's monohybrid cross, dominant and recessive traits appear in 3:1 ratio in F_2 generation.

3. The genotype of a heterozygous tall pea plant is:

- A. TT B. Tt
C. tt D. TTT (B)

Explanation : A heterozygous plant has two different alleles, so tall heterozygous pea plant is Tt.

4. The law of segregation states that:

- A. Genes blend during inheritance
B. Alleles separate during gamete formation
C. All traits are dominant
D. Linked genes always separate (B)

Explanation : During gamete formation, the two alleles of a gene pair separate, so each gamete receives only one allele.

5. In incomplete dominance, a cross between red and white snapdragon flowers gives F_1 flowers that are:

- A. Red
B. White
C. Pink
D. Yellow (C)

Explanation : In snapdragon, neither allele is completely dominant, so red $\times$ white gives pink flowers in F_1 .

6. ABO blood group inheritance is an example of:

- A. Only incomplete dominance
B. Co-dominance and multiple allelism
C. Polygenic inheritance only
D. Mutation only (B)

Explanation : ABO blood group is controlled by three alleles, and I^A and I^B show co-dominance.

7. In a Mendelian dihybrid cross, the F_2 phenotypic ratio is:

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

Explanation : A dihybrid cross shows independent assortment and produces 9:3:3:1 phenotypic ratio in F_2 .

8. The physical association of genes on the same chromosome is called:

- A. Mutation
B. Linkage
C. Dominance
D. Polyploidy (B)

Explanation : Morgan used the term linkage for genes located together on the same chromosome.

9. In humans, the sex of the child is determined by:

- A. Ovum B. Sperm
C. Uterus D. Placenta (B)

Explanation : The ovum always carries X chromosome, while sperm carries either X or Y chromosome.

10. Down's syndrome is caused by:

- A. Loss of X chromosome
B. Extra copy of chromosome 21
C. Mutation in haemoglobin gene
D. Absence of Y chromosome (B)

Explanation : Down's syndrome occurs due to trisomy of chromosome 21.