

VCD- 15/11/19

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. For **Q 2, Q 3 and Q 4** attempt A and B **OR** C and D.

Q 1 Do as directed. (Any 15)

15

1. Crosses between true-breeding strains of peas that had alternative forms of a single trait is a _____ cross.
2. When one allele of a gene is not completely dominant to another allele of the same gene, it is said to be _____ dominance.
3. The ratio of duplicate dominant epistasis is _____.
4. State true or false: A single diploid individual can have only a maximum of two of the multiple alleles.
5. Explain the term Punnett square.
6. Define genotype.
7. State whether true or false. Two different phenotypic expressions of same trait can be exhibited by an individual.
8. State whether true or false. Polymorphic locus is one of the parameter to measure genetic variation at the protein level.
9. _____ enzyme catalyses the excision and insertion events conducted by transposons.
10. Area of lysis on a bacterial lawn culture produced by a phage is known as _____.
11. The transfer of naked DNA from one cell to another is referred as _____.
12. Strains that are unable to synthesize essential nutrients are called _____.
13. The phenomenon of the insertion of a phage chromosome into a bacterial chromosome is called _____.
14. IS elements were first identified in _____ microorganism.
15. Conjugation was discovered in 1946 by _____.
16. _____ deals with molecular nature of heredity where genetic information is encoded within the DNA.
17. The genetic constitution of an individual organism is known as _____.
18. _____ is a mating between genotypes in proportion to the genotypic frequencies in the population.
19. Define - Allelic frequency.
20. Define - Mendelian population.

Q 2 A Generate a Punnett square for a pea plant heterozygous for yellow and round 08

seeds crossed with a pea plant homozygous yellow and round seeds.

Comment on the phenotypic and genotypic ratios of the same.

(NOTE: The seed colour yellow is dominant over green and the seed shape round is dominant over green).

Q 2 B Explain with a suitable example how mutation in an essential gene can lead to a recessive lethal phenotype. 07

OR

Q 2 C Elaborate on the inheritance of multiple alleles with a suitable example. 08

Q 2 D Discuss on the effect of environment on the phenotypic expression of human gene. 07

Q 3 A What are transposable elements? Give the mechanism of transposition in IS elements? 08

Q 3 B Describe the events that take place during conjugation of an Hfr and an F⁻ cell of *E. coli*. 07

OR

Q 3 C Explain in detail Specialised Transduction 08

Q 3 D Give an account of Transformation in bacteria 07

Q 4 A Describe Hardy-Weinberg law along with its assumptions. 08

Q 4 B What is genotype frequency? Explain with suitable example. 07

OR

Q 4 C Explain how genetic variation can be measured at DNA level. 08

Q 4 D Describe natural selection with an example. 07

Q 5 Write short notes on: (Any three) 15

a Codominance.

b Lysogeny.

c Prototrophs.

d Different forms of genetic drift.

e Speciation.