2021

ZOOLOGY — HONOURS

Paper : CC-12

(Principle of Genetics)

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer ***any ten*** questions.

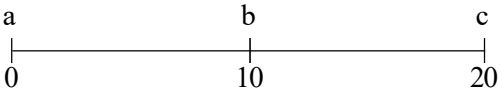
1. (a) Define Multiple alleles and Pseudoallele.

(b) "Inversions are often called Crossover Suppressors." — Explain. (1½+1½)+2

2. (a) What is the probability of producing haemophilic and normal offsprings if a carrier haemophilic female marries with a normal male? Explain with proper genetic cross.

(b) Distinguish between sex linked traits and sex influenced traits. 3+2

3. The following is a linkage map for three recessive genes located in the same chromosome measured in percentage recombination frequencies :



If the coefficient of coincidence (CC) is 0.6 in this case, determine the frequencies of phenotypes expected among 1000 offsprings of a cross abc/ABC × abc/abc. 5

4. Write short notes on ***any two*** : 2½×2

(a) Frame Shift Mutation

(b) Ac-Ds element

(c) Tautomerism

(d) IS element

(e) Robertsonian Translocation

(f) Dextral and Sinistral coiling.

5. (a) Differentiate 'Euploidy' and 'Aneuploidy'.

(b) Transposable genetic element functions on Enhancer.— Justify. 2+3

6. Explain the pattern of sex linkage in *Drosophila* with special reference to white Eye locus. 5

7. Distinguish between spontaneous mutation and induced mutation. Name some common chemical mutagens which are used to induce mutation. What are the direct and indirect effects of non-ionizing radiation on mutations? 1+1+3

8. State the role of Numerator and Denominator elements during sex determination in *Drosophila*. 5

9. (a) Why Benzer selected rII locus for complementation text?

(b) Discuss briefly the experiment of Benzer to differentiate between complementation and Recombination. 1+4

10. Comment on the role of MSL Protein in Dosage compensation of *Drosophila* with suitable illustration. 5

11. What is Testicular feminization? How a mosaic XX/XO human can be formed? 2+3

12. Bar Eye mutation in *Drosophila* sp. is an ideal example of chromosomal duplication. — Explain. 5

13. What is Kappa Particles? Explain the phenomenon of inheritance of Kappa particles in *Paramoecium*. 1+4

14. Write down the characteristic features, one each of 'Haemophilia A', 'Haemophilia B' and 'Haemophila C'. What is Holandric gene? 3+2

15. (a) Distinguish between Meiotic-I and Meiotic-II non-disjunction.

(b) Diagrammatically explain the formation of trisomy 21 from either meiosis-I or meiosis-II non-disjunction. 2+3

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