

2024

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 *question no. 1* and *any four* questions from the rest.

1. Answer *any five* questions :

(a) Define SINE and LINE sequences.	1+1
(b) Define multiple alleles. How do they differ from pseudoallele?	1+1
(c) Explain balanced lethal system with example.	2
(d) What is Retrotransposon? Give example.	1½+½
(e) Define interference and coincidence.	1+1
(f) What is haplodominance? Give one example.	1½+½
(g) What is Pleiotropy?	2
(h) What is Philadelphia chromosome?	2
2. Write short notes on *any four* of the following : 2½×4
 - (a) Criss-Cross pattern of inheritance
 - (b) Paracentric inversion
 - (c) Frame shift mutation
 - (d) IS element
 - (e) Mechanism of sex determination in man
 - (f) Alternate splicing of 'dsx' gene in *Drosophila*.
3. (a) Explain the pattern of sex linkage in *Drosophila* with special reference to white eye locus.
 (b) What is Alu element in human? Mention the significance of this element. 5+(2+3)

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4. (a) Briefly narrate the autoregulation of Sxl gene in female *Drosophila* and mention its functional status in male *Drosophila*.
(b) Describe the significance of transposable genetic element.
(c) Why Benzer selected rII locus for Complementation test? 5+4+1
5. (a) A man of blood group 'O' married a woman of blood group 'A'. Determine the probable blood group phenotypes and genotypes of their kids in next generation.
(b) Describe the salient features of Kappa particles in *Paramoecium* sp.
(c) Distinguish between recombination and complementation. 5+3+2
6. (a) Explain *cis-trans* test for allelism with special reference to the classical experiment of the complex locus lozenge.
(b) Explain how base analogue causes change in DNA sequence.
(c) Define epistasis. Give an example. 5+3+2
7. (a) Comment on the role of XIST noncoding RNA in mammalian dosage compensation.
(b) Design a cross using attached-X stock for detecting X-linked mutation in *Drosophila*.
(c) Comment on the maternal risk factor associated with human chromosome-21 nondisjunction. 4+4+2
8. Write short notes on (*any four*) : 2½×4
- (a) Hybrid dysgenesis
 - (b) Base analogue
 - (c) Complete and incomplete linkage
 - (d) Back crosses
 - (e) Penetrance and expressivity
 - (f) Isoallele.
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