

B.Sc. 5th Semester (Hons.) Examination, 2021 (CBCS)

Subject: Zoology

Paper: CC-12 (Genetics)

Full Marks: 40

Time: 2 Hrs

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

Answer any **eight** questions of the following:

5×8=40

1. Summarize the main properties of 'Polygenic inheritance'.
 2. Briefly describe the major types and the causes of spontaneous mutations in human.
 3. Mention any four mutations that has 'proven beneficial / positive effect' in a given environment / with respect to a particular existing condition.
 4. Describe how alternative splicing ultimately determines sex in *D. melanogaster*.
 5. What are the various modes of horizontal gene transfers in bacteria?
 6. Give a brief account of "SINE transposons".
 7. A holandric (Y-linked) gene is known in human beings that cause long hair to grow on the external ears. When a man with hairy ears marries a normal woman, what ratio of 'hairy-eared : normal' children is expected among four probable offspring? (Show the cross)
 8. Explain in brief the multiple allelism with respect to blood group of man.
 9. Explain extranuclear inheritance taking kappa particle in *Paramecium* as an example.
 10. In *Drosophila*, the ratio between the number of X chromosomes and the number of sets of autosomes (A) is called the sex index. As per genic balance theory, in *Drosophila*, sex phenotype is linked with this sex index. Calculate the sex index and sex phenotype in the following individuals: AAX, AAXXY, AAAXX, AAXX and AAY.
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