

Serial No. 1720

UPC: 2152013601

B.Sc. (H) Part-III Semester-VI

Human Population Genetics (Theory)

May/June 2026

Time: 3 hours

Total marks: 90

(Attempt any five questions)

(All questions carry equal marks)

1. What is the difference between genetic drift and gene flow? Also explain their impact on population diversity in humans.
2. Describe the assumptions of Hardy-Weinberg equilibrium. Use suitable diagrams and examples.
3. Discuss the landmarks in the history of human population genetics.
4. What do you understand by haplotypes and haplogroups? Explain their relevance in human evolution and migration.
5. Explain the difference between genetic mutation and genetic polymorphisms, and their role in phenotypic variations and disease susceptibility in human populations.
6. Describe the concept of natural selection. How environment plays role in determining the outcome of natural selection?
7. Explain 'selection-relaxation hypothesis' in light of transmission of deleterious alleles in human populations.
8. Describe the use of mtDNA markers in understanding the population variations in India.
9. Write short notes on *(any two)*:
 - a. Multi-locus inheritance
 - b. Transient polymorphisms
 - c. Bottleneck effect
 - d. Genetic association studies in human diseases