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3 (Sem-5/CBCS) ANT HC 1

2023

ANTHROPOLOGY

(Honours Core)

Paper : ANT-HC-5016

(Human Population Genetics)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer : $1 \times 7 = 7$

(a) Who propounded the theory of 'inheritance of acquired characters'?

(i) Darwin

(ii) Galton

(iii) Lamarck

(iv) Mendel

Contd.

(b) If both genotype and phenotype shows the same ratios of 1:2:1 in the F₂ generations of Mendel's experiment, it shows

- (i) incomplete dominance in monohybrid cross
- (ii) complete dominance in monohybrid cross
- (iii) dihybrid cross
- (iv) co-dominance

(c) Which of the following focuses on the study of patterns of inheritance?

- (i) Genetics
- (ii) Immunology
- (iii) Evolution
- (iv) Ecology

(d) Which of the following human disease is transmitted from the vector *Anopheles mosquito*?

- (i) Dengue
- (ii) Malaria
- (iii) Filariasis
- (iv) Encephalitis

(e) Hardy-Weinberg equilibrium can be disrupted by presence of all except

- (i) random mating
- (ii) non-random mating
- (iii) genetic drift
- (iv) mutations

(f) Which of the following is incorrect with respect to mutation?

- (i) Change in chromosomes and genes
 - (ii) Sudden change in genetic materials
 - (iii) Continuous changes in genetic materials
 - (iv) Leads to variation in DNA
- (g) Genetic drift is change of
- (i) gene frequency from one generation to next
 - (ii) appearance of recessive genes
 - (iii) gene frequency in same generation
 - (iv) None of the above

2. Give short answer of the following questions :

2×4=8

- (a) What is multiple allelism?
- (b) Write about sex controlled traits.
- (c) What do you mean by epistasis? Write briefly.
- (d) Write briefly about X-linked polymorphism.

3. Answer **any three** of the following questions :

5×3=15

- (a) How random mating differ from non-random mating? Explain with suitable example.
- (b) How mutation effects gene frequency in human population? Write briefly.
- (c) Write the relationship between sickle cell and malaria.

(d) Write the difference between sex-linked and sex-limited traits.

(e) Mention the basic concept of segregation and independent assortment.

4. Answer **any three** of the following questions : $10 \times 3 = 30$

(a) Discuss the major landmarks in the history of Human Genetics.

(b) Discuss the Hardy-Weinberg principle with its application in population genetics.

(c) How gene flow and genetic drift can change the gene frequency of a population? Discuss.

(d) What do you mean by polymorphism? Write about the phenotypic and genotypic polymorphism, transient polymorphism and balanced polymorphism.

(e) Discuss the single locus and multilocus inheritance with suitable example.

(f) Explain the process of Mendelian single factor inheritance pattern with suitable examples.