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5 SEM TDC ANTH (CBCS) C 11

2022

(Nov/Dec)

ANTHROPOLOGY

(Core)

Paper : C–11

(Human Population Genetics)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct answer : 1×5=5

(a) The tendency of a population to remain in genetic equilibrium may be disturbed by

(i) random mating

(ii) lack of gene flow

(iii) lack of mutations

(iv) lack of random mating

(b) The genes for the seven characters of pea which were chosen by Mendel are located on

(i) four chromosomes

(ii) five chromosomes

(iii) six chromosomes

(iv) seven chromosomes

(c) For a woman living in endemic malarial environment of Africa, which genotype would be the most advantageous to have?

(i) Homozygous for the sickle-cell allele

(ii) Homozygous for the normal haemoglobin allele

(iii) Heterozygous for the sickle-cell allele

(iv) All the above are equally advantageous

(d) Which statement most accurately defines what population geneticists refer to as 'fitness'?

(i) Fitness is the measure of an organism's adaptability to scarcity of food resources

(ii) fitness reflects the number of mates each individual selects

(iii) fitness refers to the relative health of each individual in the population

(iv) fitness is a measure of the contribution of a genotype to the gene pool of the next generation

(e) What mechanism of evolution occurs when allele frequencies change over generations due to random chance?

(i) Gene flow

(ii) Natural selection

(iii) Genetic drift

(iv) Mutation

2. Elaborate the significance and objectives of population genetics from the anthropological perspective. 3+6=9

Or

Who derived the three-dimensional double helical structure of DNA? Provide a brief sketch of the significant landmarks in the history of genetics. 1+8=9

3. What is a quantitative trait? Discuss polygenic inheritance of traits in human that cause continuous variation of phenotypes. 2+7=9

Or

What do you understand by multiple allelism? Discuss its characteristics. Illustrate ABO blood group as an example of multiple allelism in human populations. 2+3+4=9

4. What are the assumptions of Hardy-Weinberg equilibrium? How is Hardy-Weinberg principle applicable to human populations? Elucidate. 3+6=9

Or

Define balanced polymorphism. Discuss the statement, "Sickle-cell trait has been shown to confer protection against malaria". 3+6=9

5. What do you understand by founder effect? Discuss the mechanism of natural selection for allelic frequency change in human population. 2+7=9

Or

What do you understand by genetic markers? Highlight the importance and uses of genetic markers in disease association studies. 2+7=9

6. Write short notes on (any *three*) : 4×3=12

   (a) Autosomal recessive trait

   (b) Mutation and polymorphism

   (c) Genetic drift

   (d) Double helical structure of DNA

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