

M.sc (previous) Zoology  
Sixth paper  
Quantitative biology and population genetics

Time: 3 Hrs.

Max. Marks: 100

1. Answer the following question in brief.
  - a. What is the characteristic of quantitative traits?
  - b. Define inbreeding depression.
  - c. List the conditions under which Hardy Weinberg law fails to apply.
  - d. Name the components of genetic variation.
  - e. Define multigene families.
  - f. Give the concept of evolutionary clock.
  - g. What are the mechanism of evolution?
  - h. Define orthogenesis.
  - i. Write any two postulates of Lamarck.
  - j. Write the chief points of Darwin,s theory.
  - k. Define the term migration in population genetics.
  - l. What are the major effects of different evolutionary processes on the genetic structure of the population?
  - m. Define range in statistics.
  - n. Define regression.
  - o. What is weighted average?
  - p. What is standard deviation?
  - q. Differentiate between median and mode.
  - r. IF a matrix has twelve elements, what are the possible orders it can have?
  - s. Define vector quantities with suitable examples.
  - t. Write the formula of Chi-square test.
2. A drug is given to ten patients and the increment in their blood pressure was recorded to be 3,6,-2,4,-3,4,6,0,0,2. Is it reasonable to believe that the drug has no effect on change of blood pressure? 5% value of t for 9 df=2.26.

Or

Write short notes on the following;

- a. Coefficient of variation
- b. scope of biostatistics
- c. Add the following matrices;

$$A = \begin{bmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \end{bmatrix}$$

$$B = \begin{bmatrix} d_1 & e_1 & f_1 \\ d_2 & e_2 & f_2 \end{bmatrix}$$

d. Binomial probability distribution.

3z. Describe the different models explaining changes in genetic structure of populations.

Or

Describe the different theory of evolution.

Define evolution and discuss the concept of evolution given by Lamarck and its criticism.

Or

Discuss the relationship between demographic trend and spread of human disease frequency.

5. What is speciation? Describe the different models of speciation.

Or

Write the procedure for construction of phylogenetics trees with the help of DNA sequences. What is the difference between speciation and gene tree.