

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

M. Sc.-I Semester (Biotechnology)

Course Code: 20 MS1BT115

Max Marks: 25

Course: Genetics

Instructor: Prof. Sudhir Kumar

Max Time: 1 hour 30 minutes

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems

Q1: Calculate the change in p and q for

Case 1: $p = 0.5$, $q = 0.5$

Case 2: $p = 0.8$, $q = 0.2$

The value for $W_{11} = 1.5$, $W_{12} = 1.0$, $W_{22} = 0.5$

Evaluate the result in light with Fisher's theorem of natural selection. [7]

Q2: a) Yeast mating switch brings variations in yeast strains. How does this switch operate and elucidate the process of switching of mating types?

b) A recessive allele frequency of a character is 0.02, Find out the percentage of heterozygous individuals. [3+2]

Q3: a) A great grand child may inherit two copies of same allele. Justify this by giving an example of pedigree and calculate the percentage probability of this event.

b) A person is suffering from X linked recessive disorder. His wife is carrier to the same disorder. Find out the probability that 1/2 of their daughters will be suffering. [3+2]

Q4: a) Evaluate the impact of Founder effect and Bottleneck effect on evolution.

b) Differentiate between continuous and discontinuous variations giving suitable examples.

c) Is it possible to find out blood group through family pedigree without doing test ? Design a hypothetical pedigree to support your answer [3+3+2]