

TRIBHUVAN UNIVERSITY

GOKULESHWOR AGRICULTURE AND ANIMAL SCIENCE COLLEGE

B. Sc. Ag., Internal Assessment, 2076

Subject: Introductory genetics

FM: 10

Time: 60 Minutes

PM: 4

Level: 3th semester

Answer all questions.

Essay type (4)

1. In maize, F1 heterozygous plants were test crossed with colourless, shrunken, waxy plants and the following types of progeny were obtained. CfS: 50, cFs: 46, Cfs: 383, cfS: 380, Dfs: 72, cFS: 68, CFS: 6, cfs: 5. Symbols: Colored = C, Colorless = c, Full = F, Shrunken = f, Starchy = S, waxy = s.
 - a. Are these genes linked ? Give reason.
 - b. Write the genes in correct order on the chromosome.
 - c. What are double crossover, non-crossover and single crossover types ?
 - d. Write the genotypes involved in the parental and test crosses.
 - e. Draw a linkage map showing map distances.
 - f. Calculate coefficient of coincidence (CC) and inference.

Short answer type (1.5 x 4 = 6)

1. A heterozygous plant for two genes is self-fertilized and in F2, the following seeds are observed.
 - Round yellow: 315,
 - Round green: 108,
 - Wrinkled yellow: 101,
 - Wrinkled green: 32

Perform chi-square test for goodness of fit and interpret the result. (Tabulated chi-square value at 3d.f. = 7.81)

2. What do you mean by extra nuclear inheritance? Explain with the help of example. Write down the characteristics of cytoplasmic inheritance.
3. What is sporogenesis and oogenesis? Diagrammatically show, how gamete formation takes place in life cycle of maize.
4. Explain in brief about Lac operon system in E. coli.