EASTERN UNIVERSITY, SRI LANKA
SECOND YEAR/ FIRST SEMESTER EXAMINATION
IN AGRICULTURE- 2000/2001

GENETICS (AGB 2102)

Time: 3 hours

Answer All questions.

1) a) Explain the terms "Linkage and Crossing Over".

b) What are the aspects to be considered in gene mapping?

c)"The map distances are generally underestimated if the middle gene marker is not present". Explain.

2) a) Define Hardy-Weinberg Equilibrium (HWE).

b) Give the conditions required for the above.

c) Proof HWE of a random mating population with "A" and "a" alleles at the frequency of p and q respectively.

3) Describe the following:

a) Different types of euploidy

b) Quantitative inheritance with suitable example.

4) Write short notes on the following:

a) Cell cycle

b) Chromosomal deletion

c) Incomplete dominance

5) Three recessive genes in a linkage group of the tomato are "a" producing absence of anthocyanin pigment, "hl" producing hairless plants, and "j" producing jointless fruit stems (pedicels). Among 3000 progeny from a tryhybrid testcross, the following phenotypes were observed

259 hairless

  40 jointless, hairless

931 jointless

260 normal

268 anothocyaninless, jointless, hairless

941 anothocyaninless, hairless

  32 anothocyaninless

269 anothocyaninless, jointless

a) How were the genes originally linked in the trihybrid parent?

b) Estimate the distance between the genes.

6) It is suspected that the excretion of the strongly odorous substance methanethiol is controlled by a recessive gene m in man; nonexcretion is governed by the dominant allele M. If the frequency of m is 0.4 in Batticaloa, what is the probability of finding two nonexcretor boys and one excretor girl in Batticaloa families of size three where both parents are nonexcretors?