

Eastern University, Sri Lanka

EASTERN UNIVERSITY, SRI LANKA
SECOND YEAR IN SCIENCE - 1994/95 & 95/96; Sept. 97

ZL 201 Principles of Genetics

Time: 02 hours

Answer **FOUR** questions only.

Illustrate your answers with clear labelled diagrams where necessary.

01. Write short notes on any three of the following:
 - a) Nonsense mutations
 - b) Hardy- Weinberg equilibrium
 - c) Polytene chromosomes
 - d) Co - dominance
 - e) Sex linkage

02. Explain the following:
 - a) Sequencing of DNA molecules
 - b) Chromosome aberrations

03.
 - a) What do you understand by the term genetic engineering ?
 - b) Briefly describe the two major processes that are involved in the formation of a genetically engineered animal.

04.
 - a) What is complementation test ?
 - b) Briefly explain how you would carry out an experiment to illustrate that there is a complementation between mutations.

05. Comment on the following:
 - a) In four- O' clock plants, seeds from red flower plants do not always give red flower petals.
 - b) In *Drosophila*, occasionally one half of the animal look like a male and the other half like a female.
 - c) Occasionally human male, is "phenotypically a female".
 - d) Some human beings cannot differentiate rippen chillies from unripped chillies.

06.
 - a) Phenyl thio carbamide (PTC) tasting is dominant (T) to non tasting (t).
If a taster woman with a non taster father married a taster man, who in a previous marriage had a non taster daughter, what would be the probability that,
 - i) their first child would be a non taster ?
 - ii) their first child would be a non taster female ?

contd ..2..

- b) In turkeys, the gene for short wattle (l) is X-linked recessive. Its wild type allele (L) is responsible for producing a long wattle in turkeys, like in all birds, the female is the heterogametic sex, possessing an X and a Y chromosome. The male has two X chromosomes. The sex of a female can be reversed to male if one of the functional ovary is destroyed or removed. Assuming that such a reversal can yield a fertile male, what will be the phenotypic ratio of a cross between a short-wattled reversed male and a long-wattled female.

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