



MURANG'A UNIVERSITY COLLEGE

(A constituent college of Jomo Kenyatta University of Agriculture and Technology)

SCHOOL OF PURE AND APPLIED SCIENCE

CLASS: AS/BIO/14D

UNIT CODE ASB 1109

UNIT TITLE: CYTOLOGY, HISTOLOGY AND GENETICS

DURATION: 3 HOURS

DATE: 5TH AUGUST 2015

SPECIAL EXAMINATION

INSTRUCTIONS

This paper consists of section A and B

Answer ALL questions in section A and any THREE questions from section B

SECTION A

1. Define the following terms as used in histology
 - i. Histology
 - ii. Biopsy
 - iii. Autopsy
2. Give a brief account why cytology should be studied. (4marks).
- 3.a) Name two plant and animal tissues. (2marks
b) Name two examples of a laboratory where histological work for animals can be done . (2 marks)
- 4.a) State two types of compound fixatives. (2 marks)
b) Name two stains used in tissues staining during microscopy. (2marks)
- 5.a) Name two types of microscopes (2 marks)
b) State two contributions of microscopes in science development. (2marks).
6. Describe co- dominance in genes . Give one example of co-dominance in human beings. (4marks)

7. In dogs dark coat colour is dominant over albino and short hair is dominant over long hair .
If these characteristics are caused by two independently segregating genes, write the most probable phenotypes of the offspring when a dark, short haired dog is mated with an albino, long haired dog, using a cross. (4 marks)
8. A hemophiliac man marries a carrier female. Use the letter H to represent a normal gene for blood clotting and show the genotypes of the children resulting from this marriage. (4marks).
9. Distinguish between sex linked and sex limited genes. (4 marks)
10. A blue eyed man marries a woman with brown eyes. Two children, one blue eyed and the other brown eyed are born to the couple. Work out the possible genotypes of the parents. (4marks).

SECTION B

Answer any three questions from this section.

11. A homozygous purple flower short stemmed plant was crossed with a homozygous red flowered long stem plant and the F1 phenotypes had purple flowers and short stems.
When the F1 generation was test crossed with a double recessive plant, the following progeny was produced:

52 Purple flower, short stem
47 Purple flower long stem
47 Red flower short stem
45 Red flower long stem

Explain these results. (20 marks)

12. a) Define the terms

- i. Alleles
- ii. Phenotypes
- iii. Genotypes

(3 marks)

- b) State the law of independent assortment.

2marks)

- c) Describe the following and give one example
- i. Lethal gene.
 - ii. Test cross
 - iii. Multiple alleles (12 marks)
- d) Explain incomplete dominance and by use of crosses show partial dominance. (3 marks)
13. Describe mutations and give examples of at least FIVE aberrations. (20marks)
14. Discuss epithelial cells (20 marks)
15. Describe the following physiological processes
- a) Active transport (5marks)
 - b) Osmosis (5 marks)
 - c) Phagocytosis (5 marks)
 - d) Pinocytosis (3 marks)
 - e) Facilitated diffusion (2 marks)