



MACHAKOS UNIVERSITY

University Examinations 2022/2023 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

SZL 408 APPLIED IMMUNOLOGY

DATE:

TIME:

Instructions

1. Answer 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

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|--|-----------|
| a) Describe Coons insights on antibodies | (3 marks) |
| b) Outline factors to consider when using immunofluorescence based staining system | (3 marks) |
| c) Distinguish between antibody affinity and avidity | (2 marks) |
| d) Describe the limitations of CAR-T cell immunotherapy | (3 marks) |
| e) Describe the principle of electrophoresis in the quantitation of antibodies | (3 marks) |
| | |
| f) Describe the process of P-nucleotide addition | (3 marks) |
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| g) Evaluate the role of CTLA-4 in cancer immunotherapy | (3 marks) |
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| h) Describe features of polyclonal antibodies | (4 marks) |
| | |
| i) Describe the immune responses that promotes tumour growth | (4 marks) |
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| j) Describe how you can make use of dendritic cells for vaccinations | (4 marks) |

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

QUESTION TWO (20 MARKS)

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|---|------------|
| a) Describe the principle and process of the immunohistochemistry | (6 marks) |
| | |
| b) Discuss MHC polymorphism and its impact on vaccine design | (14 marks) |

QUESTION THREE (20 MARKS)

- a) Discuss the genetics of Ig diversity productions (10 marks)
- b) Discuss precipitation reaction assay (10 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the process of hybridomas antibodies productions (10 marks)
- b) Discuss the implications of low levels of HLA-G in expectant mothers (10 marks)

QUESTION FIVE (20 MARKS)

Discuss the principle and application of capture 'sandwich' ELISA