MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL 408 APPLIED IMMUNOLOGY

DATE: 9/12/2021   **TIME: 11.00-1.00 PM**

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)

a) Account for the fact that in HLA-A there are 372 alleles and yet only 348 proteins are produced.   (1 mark)

b) Distinguish between antibody affinity and avidity.   (2 marks)

c) Describe the limitations of CAR-T cell immunotherapy.   (3 marks)

d) Describe the principle of electrophoresis in the quantitation of antibodies.   (3 marks)

e) Describe two different properties that make it difficult for pathogens to evade immune responses   (3 marks)

f) Describe the process of N-nucleotide addition.   (3 marks)

g) Evaluate the role of CTL-A-4 in cancer immunotheraphy.   (3 marks)

h) Contrast polyclonal and monoclonal antibodies.   (4 marks)

i) Describe the immune responses that promotes tumour growth.   (4 marks)

j) Describe the use of dentritic cells in vaccinations.   (4 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTION

QUESTION TWO (20 MARKS)

a)   Describe the principle and process of the immunohistochemistry.   (6 marks)

b)   Discuss the cross-presentations of the tumour antigens.   (14 marks)

QUESTION THREE (20 MARKS)

 Discuss the genetics of Ig diversity productions.

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 competetive ELISA.