MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SUPPLEMENTARY/SPECIAL EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL 408 ADVANCE IMMUNOLOGY

DATE: 18/3/2022 **TIME : 8:30- 10:30 AM**

Instructions

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

SECTION A

Question 1.

i. Describe the Coon's insight and its importance in immunological diagnostics (3 marks)

ii. Describe the process of P-Nucleotide addition during the rearrangements of the immunogenetics (3 marks)

iii. Expound SIX factors that can affect immuno- fluorescence staining technique (3 marks)

iv. Describe the genetic structure of the antibody (3 marks)

v. Explain the process of N-Nucleotide addition during deletional rearrangement of the antibody structure (3 marks)

vi. Compare and contrast the MHCI and MHCII antigen processing pathways (3 marks)

vii. Describe the application of HLA polymorphism in vaccine design (3 marks)

viii. Distinguish between haptens and conjugated antigens (3 marks)

ix. Briefly discuss the requirements for the Mixed Lymphocyte immunological reaction in transplantation (3marks)

x. Define the concept and types of immunological tolerance (3marks)

SECTION B

QUESTIONS 2.
You have a patient suspected to have contracted a viral infection. According to the epidemiology of an area, strain A and B are the most prevalent viruses. Describe any immunological diagnostic procedure to confirm the strain that the patient might have contracted. (20 marks)

QUESTIONS 3.
A patient is suspected to be suffering from a disease that is caused by a parasite Y that induces the expression of antigen X on the surface of the T lymphocytes. Using Flow cytometry technique discuss how you can confirm the infection. (20 marks)

QUESTIONS 4.
a) Discuss how foetus evades implantation rejection (10 Marks)
b) Describe a stepwise mechanism of the use of gene therapy to correct a certain immunological disorder (10 Marks)

QUESTION 5
a) Discuss the concept and method of hybridoma technology (10 Marks)
b) Discuss deletional joining as a mechanism that leads to antigenic diversity and recognition. (10 Marks)