



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL 408 APPLIED IMMUNOLOGY

DATE: 22/7/2019

TIME: 8.30-10.30 AM

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## INSTRUCTIONS

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

## SECTION A

### QUESTION ONE

- a) Describe the Coon's insight and its importance in immunological diagnostics (3 marks)
- b) Describe the process of P-Nucleotide addition during the rearrangements of the immunogenetics (3 marks)
- c) Expound SIX factors that can affect immuno- fluorescence staining technique (3 marks)
- d) Describe the genetic structure of the antibody (3 marks)
- e) Explain the process of N-Nucleotide addition during deletional rearrangement of the antibody structure (3 marks)
- f) Compare and contrast the MHCI and MHCII antigen processing pathways (3 marks)
- g) Describe the application of HLA polymorphism in vaccine design (3 marks)
- h) Distinguish between haptens and conjugated antigens (3 marks)
- i) Briefly discuss the requirements for the Mixed Lymphocyte immunological reaction in transplantation (3 marks)
- j) Define the concept and types of immunological tolerance (3 marks)

## **SECTION B**

### **QUESTIONS TWO**

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 THREE**

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 FOUR**

- 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 FIVE**

- 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)