



# 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 (BIOLOGY)

SZL 407: ADVANCED IMMUNOLOGY

DATE: 16/3/2022

TIME : 2:00 – 4:00 PM

## INSTRUCTIONS

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

## SECTION A

### Question 1

- a) Describe the origin of dendritic cells (3marks)
- b) Using a well labelled diagram describe the structure of Lymph node (4 marks)
- c) Distinguish the following lymphocytes using a laboratory experiment: T helper, T cytotoxic, and B lymphocyte (3marks)
- d) Describe the sex based hormonal dependent autoimmunity (2 marks)
- e) Describe tumour immune evasion (3 marks)
- f) Evaluate three potential cytokines in tumour treatment (3 marks)
- g) Illustrate basic structure of a gut associated lymphoid tissue (3marks)
- h) Outline strategies of antigen presentation (3marks)
- i) Describe the sex based immune response autoimmunity (3 marks)
- j) Illustrate semi-direct antigen presentation of the membrane patch pathway (3 marks).

## SECTION B

### QUESTION 2.

Discuss the macrophages - antigen based hypersensitivity (20 marks)

### QUESTION 3.

- a) Discuss antibody production in the germinal center of lymph node (10 marks)
- b) Describe the molecular basis of auto immunity (10 marks)

### QUESTION 4

Describe the processes involved in bacterial induction of:

- a) TH1 (10 marks)
- b) TH2 (10 marks)

### QUESTION 5

- a) Discuss affinity antibody maturation (10 marks)
- b) Discuss cytokine involvement in the activation of Th cells (10 marks)