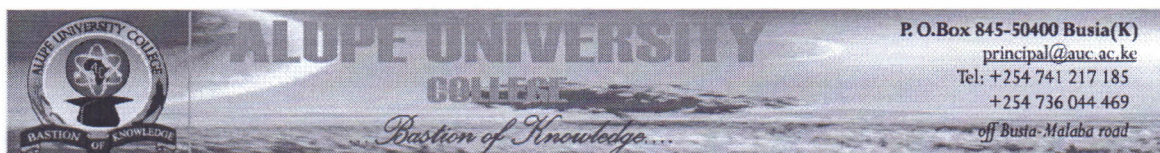


BIO 410



OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

UNIVERSITY EXAMINATIONS

2020 /2021 ACADEMIC YEAR

FOURTH YEAR FIRST SEMESTER MAIN EXAMINATION

**FOR THE DEGREE OF BACHELOR OF SCIENCE
IN MICROBIOLOGY**

COURSE CODE: BIO 410

COURSE TITLE: IMMUNOLOGY

DATE: 11TH MARCH 2021

TIME: 2.00 P.M – 5.00 P.M

INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF 3 PRINTED PAGES

PLEASE TURN OVER

REGULAR – MAIN EXAM**BIO 410: IMMUNOLOGY****STREAM: BSc. Microbiology****DURATION: 3 Hours**

INSTRUCTION TO CANDIDATES

- i. Answer ALL questions from section A and any **THREE** from section B.*
- ii. Diagrams should be used whenever they serve to illustrate the answer.*
- iii. Do not write on the question paper.*

SECTION A (24 MARKS)**Question One**

- a) Explain an immune response? (3 Marks)
- b) Explain four characteristics of an immunogenic agent. (2 Marks)
- c) Highlight three effects of an immune disorder. (3 Marks)
- d) Distinguish between low affinity antibodies and high affinity antibodies. (2 Marks)

Question Two

- a) Outline the principle of precipitation. (2 Marks)
- b) Describe the intermolecular forces involved in Antigen- Antibody reactions. (4 Marks)
- c) Maturation of a B or T cell involves becoming immunocompetent. Explain (3 Marks)
- d) Explain role of normal flora in innate immunity. (3 Marks)

SECTION B (36 MARKS)**Question Three**

- a) Explain the role played by B and T cells in the adaptive immune system (10 Marks)
- b) Point out two ways in which an adjuvant enhances an immune response. (2 Marks)

Question Four

- a) Which two main functional features characterize hematopoietic stem cells. (2 Marks)
- b) Elaborate what is implied by herd immunity during this COVID-19 pandemic. (4 Marks)
- c) Compare and contrast between specific immunity and non-specific immunity. (6 Marks)

Question Five

- a) Describe the procedure for direct agglutination test and expected results. (6 Marks)
- b) Discuss passive immunity. (6 Marks)

Question Six

- a) Briefly describe the different sub-types of T-cells. (6 Marks)
- b) Outline the characteristics of :-
 - i. IgG (3 Marks)
 - ii. IgM (3 Marks)

Question Seven

Write an essay on

- a) Indirect ELISA (6 Marks)
- b) Factors affecting antigen-antibody reactions. (6 Marks)
