



W1-2-60-1-6

**JOMO KENYATTA UNIVERSITY  
OF  
AGRICULTURE AND TECHNOLOGY  
UNIVERSITY EXAMINATIONS 2022/2023**

**END OF SEMESTER EXAMINATIONS FOR THE DEGREE OF MASTER OF  
SCIENCE IN PUBLIC HEALTH**

**TIM 3100: PRINCIPLES OF IMMUNOLOGY**

**DATE: AUGUST 2023**

**TIME: 3 HOURS**

**INSTRUCTIONS: ANSWER ANY FOUR QUESTIONS**

Answer any 4 Questions

1. With the aid of a flow diagram, describe:
  - (a) B cell lymphopoiesis from the bone marrows to the spleen (15 marks)
  - (b) T cell lymphopoiesis in the thymus (10 marks)
  
2. (a) Give an account of granulocytes and their role in immune response (10 marks)  
(b) Discuss various antibody classes and their physiological roles (15 marks)
  
3. (a) Differentiate between innate and adaptive immunity. (5 marks)  
(b) Describe any five importance of colostrum to newborns (5 marks)  
(c) Briefly explain how tolerance is induced and how it is beneficial (5 marks)  
(d) Discuss adjuvants and their mode(s) of action (10 marks)
  
4. (a) Discuss determinants of antigenicity and/or immunogenicity (20 marks)  
(b) With relevant examples, explain any two factors driving immune cell differentiation (5 marks)
  
5. (a) Explain antibody/B cells effector functions. (10 marks)  
(b) Describe any 5 antimicrobial mechanisms of phagocytes. (10 marks)  
(c) Describe antigen processing and presentation to T cells. (5 marks)
  
6. You are given a piece of mouse lymph nodes and tasked with determining the proportion of the B cells and T cells therein. Describe how you would go about the process (25 marks)