



UNIVERSITI KUALA LUMPUR  
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

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**FINAL EXAMINATION**  
**MARCH 2025 SEMESTER**

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COURSE CODE : HDD20103  
COURSE TITLE : HUMAN IMMUNOLOGY  
PROGRAMME NAME : DIPLOMA OF MEDICAL LABORATORY TECHNOLOGY  
DATE : 30 JUNE 2025  
TIME : 9:00AM - 12:00PM  
DURATION : 3 HOURS



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**INSTRUCTIONS TO CANDIDATES**

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1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Section A consist 25 MCQ or EMQ questions. Answer ALL questions.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet.  *Tick if applicable*
9. Refer to the attached Formula/ Appendies.  *Tick if applicable*

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THERE ARE 10 PAGES OF QUESTIONS INCLUDING THIS PAGE

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SECTION A (Total: 25 marks)

Answer ALL questions.

Please use the objective answer sheet provided.

1. Cytokines and hormones are both chemical messengers. What distinguishes cytokines from hormones?
  - A. Cytokines have higher molecular weight than hormones
  - B. Cytokines always act distally
  - C. Hormones lack receptors
  - D. Cytokines are not exclusively produced by specialized glands
  
2. What is the first step of phagocytosis?
  - A. Engulfing foreign matter
  - B. Detection of antigens by receptors
  - C. Phagosome formation
  - D. Merging with lysosome
  
3. What is the main function of phagocytes?
  - A. Regulate body temperature
  - B. Transport nutrients
  - C. Ingest harmful foreign particles
  - D. Produce antibodies
  
4. Which of the following is a characteristic of highly immunogenic substances?
  - A. Composed of lipids and nucleic acids only.
  - B. Small and chemically simple molecules.
  - C. They fail to induce an immune response upon first exposure.
  - D. Usually large, complex molecules with high molecular weight.

5. What is the primary role of T cells in the immune system?
  - A. Produce antibodies
  - B. Engulf pathogens
  - C. Secrete cytokines
  - D. Recognize antigens
  
6. Which type of cell is primarily involved in the innate immune response?
  - A. Macrophages
  - B. Memory cells
  - C. B cells
  - D. T cells
  
7. What are pattern recognition receptors (PRRs) specialized in?
  - A. Producing antibodies
  - B. Releasing histamine
  - C. Recognizing pathogens
  - D. Engulfing antigens
  - E. Producing antibodies
  - F. Releasing histamine
  - G. Engulfing antigens
  - H. Recognizing pathogens
  
8. What is extravasation?
  - A. Movement of leukocytes from blood into tissues
  - B. Programmed cell death
  - C. Formation of scar tissue
  - D. Shrinking of blood vessels

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10. Which of the following best describes a cytokine?
- A. Lipid that forms cell membranes
  - B. Nucleic acid involved in transcription
  - C. Carbohydrate that stores energy
  - D. Signaling protein secreted by immune cells
11. What is the main function of neutrophils?
- A. Transport oxygen
  - B. Regulate blood pressure
  - C. Produce hormones
  - D. Perform phagocytic activities
12. What is the main function of inflammation?
- A. Produce antibodies against pathogens
  - B. Eliminate causes of injury and initiate tissue repair
  - C. Decrease blood supply to tissues
  - D. Reduce immune surveillance

13. What is chemotaxis?
- A. The process of cell division
  - B. Movement towards a chemical signal
  - C. Formation of blood cells
  - D. Digestion of foreign material
14. What type of cells are macrophages derived from?
- A. Basophils
  - B. Monocytes
  - C. Eosinophils
  - D. Neutrophils
15. What is a hapten?
- A. Subunit of an antibody
  - B. Degraded antigen fragment
  - C. Membrane receptor on B cells
  - D. Small molecule that becomes immunogenic when bound to a carrier
16. What do macrophages do with antigens?
- A. Engulf and break them down
  - B. Produce antibodies against them
  - C. Store them for later use
  - D. Releases histamine to trigger allergic reaction

17. Which type of T cell is responsible for destroying infected host cells?
- A. Memory T cells
  - B. Helper T cells
  - C. Cytotoxic T cells
  - D. Regulatory T cells
18. What do basophils release when stimulated?
- A. Perforin
  - B. Ubiquitin
  - C. Antibodies
  - D. Histamine
19. What is the main function of dendritic cells?
- A. Act as antigen presenting cells
  - B. Involved in allergies
  - C. Destroy infected cells
  - D. Secrete antibodies
20. Which type of leukocyte is known for its role in allergic reactions?
- A. Macrophage
  - B. Neutrophil
  - C. Dendritic cell
  - D. Eosinophil

21. What is the first line of defense in the immune system?
- A. Humoral immunity
  - B. Cytotoxic lymphocyte action
  - C. Memory cell response
  - D. Physical and chemical barriers
22. What is an antigen?
- A. Foreign substance that elicits an immune response.
  - B. Signal molecule used by immune cells.
  - C. Fragment of a host cell.
  - D. A type of leukocyte.
23. What do B cells produce when activated?
- A. Antibodies
  - B. Plasma cells
  - C. Memory B cells
  - D. Phagocytes
24. What does immunity refer to?
- A. The degeneration of immune cells
  - B. Protection against harmful pathogens
  - C. A state of persistent infection
  - D. The process of inflammation

25. Which type of immunity is present at birth?
- A. Active immunity
  - B. Innate immunity
  - C. Acquired immunity
  - D. Adaptive immunity

SECTION B (Total: 75 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

Mr. T is a scientist who works with the swine influenza virus (SIV). He accidentally got exposed to the virus and became sick but recovered after two weeks. Two weeks later, he was exposed again but this time did not get very sick.

- (a) Explain why Mr. T got less sick the second time. In your answer, describe what happens during the first and second exposure to the virus, and name the parts of the immune system involved.

(10 marks)

- (b) Illustrate the process of phagocytosis.

(10 marks)

- (c) Describe the biological functions of human complement system

(5 marks)

Question 2

Explain the followings:

- (a) The isotypes of antibody and the characteristics of each group

(10 marks)

- (b) The process and mechanism used by our innate immune system to protect the human body from invading pathogens

(15 marks)

**Question 3**

Inflammation is one of the body's key defense mechanisms against infection and injury. It involves a complex set of coordinated responses aimed at eliminating harmful stimuli and initiating tissue repair.

(a) State the definition and purpose of inflammation  
(3 marks)

(b) Describe the mechanism of inflammation by explaining its major phases. For each phase, identify the key components involved and explain their roles in the inflammatory process.  
(12 marks)

(c) Briefly explain the types of hypersensitivity reactions.  
(10 marks)

**Question 4**

The immune system plays a vital role in protecting the human body from pathogens. In various situations, such as bacterial infections and allergic reactions, different immune cells and mechanisms are activated as part of the body's defense system.

(a) Describe the cells of the immune system that are involved in phagocytosis and allergic reactions.  
(10 marks)

(b) Using proper examples, describe the elements of innate immunity.  
(15 marks)

END OF EXAMINATION PAPER

