



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCE  
DEPARTMENT OF REHABILITATION MEDICINE  
BACHELOR OF SCIENCE IN PHYSIOTHERAPY  
END OF SEPT-DECEMBER 2024 TRIMESTER EXAMINATIONS**

**UNIT CODE: PHT 122                      UNIT NAME: Immunology (Main Paper)**

**DATE:                      Tuesday/ 10th/ December**

**TIME:                      TWO HOURS**

**START:                      6PM                                      STOP : 8.30PM**

**INSTRUCTIONS (physical exams)**

- 1. Do not write on this question paper**

(Marks and questions distribution as per program curriculum.)

**INSTRUCTIONS (Online examinations)**

1. This exam is marked out of 70 marks
2. This Examination comprises 3 Sections
3. This online exam shall take 2 Hours
4. Late submission of the answers will not be accepted
5. Ensure your web-camera is on at all times during the examination period
6. No movement is allowed during the examination
7. Idling of your machine for 5 min or more will lead to lock out from the exam
8. The Learning Management System (LMS) has inbuilt integrity checks to detect cheating
9. Any aspect of cheating detected during and or after the exam administration will lead to nullification of your exam
10. In case you have any questions call the invigilator for this exam on Tel. 0705833434 and or the Head of Department on Tel 0720491032
11. For adverse incidences please write an email to: [amiu.examinations@amref.ac.ke](mailto:amiu.examinations@amref.ac.ke)

**SECTION I: MULTIPLE CHOICE QUESTIONS**

**(30 MARKS)**

*Attempt ALL questions*

1. A deficiency of both B cells and T cells is most likely
  - A. a secondary immunodeficiency.
  - B. a complex immunodeficiency.
  - C. an acquired immunodeficiency.
  - D. a primary immunodeficiency.
2. Antibodies function to
  - A. directly destroy foreign organ grafts.
  - B. mark invading organisms for destruction.
  - C. kill intracellular viruses.
  - D. directly promote cytokine synthesis.
3. T/F \_\_\_\_\_ A membrane attack complex drills circular holes in a macrophage.
4. Toll-like receptors (TLRs) act to
  - A. bind microbial proteins and polysaccharides.
  - B. induce phagocytosis.
  - C. cause phagocytic chemotaxis.
  - D. destroy microbial cells.
5. Among the key molecules that control cell-mediated cytotoxicity are
  - A. perforin.
  - B. immunoglobulins.
  - C. complement.
  - D. cytokines.
6. T/F \_\_\_\_\_ NETs are webs produced by neutrophils to trap microbes.
7. Complement must be inactivated because if it were not,
  - A. viruses could continue to multiply inside host cells using the host's own metabolic machinery.
  - B. necessary interferons would not be produced.
  - C. protein synthesis would be inhibited, thus halting important cell processes.
  - D. it could make holes in the body's own cells.
8. MHC class II molecules bind to \_\_\_\_\_ and trigger\_\_\_\_\_.
  - A. endogenous antigens; cytotoxic T cells
  - B. exogenous antigens; cytotoxic T cells
  - C. antibodies; B cells
  - D. endogenous antigens; helper T cells
  - E. exogenous antigens; helper T cells

9. The major class of immunoglobulin found on the surfaces of the walls of the intestines and airways is secretory
- A. IgG.
  - B. IgA.
  - C. IgE.
  - D. IgD.
10. When a surgeon conducts a cardiac bypass operation by transplanting a piece of vein from a patient's leg to the same patient's heart, this is \_\_\_\_\_
- A. a rejected graft.
  - B. an autograft.
  - C. an allograft.
  - D. a cardiograft.
11. The process of opsonization involves antibodies:
- A. Cross-linking adjacent cells to form large immune complexes.
  - B. Binding to toxins and inactivating them.
  - C. Activating natural killer cells to kill infected cells.
  - D. Coating pathogens to enhance phagocytosis by macrophages.
12. How do antimicrobial peptides contribute to innate barriers?
- A. They directly kill pathogens by disrupting their membranes.
  - B. They produce antibodies against pathogens.
  - C. They activate T cells.
  - D. They neutralize toxins released by pathogens.
13. Which pattern recognition receptor (PRR) recognizes and binds to pathogen-associated molecular patterns (PAMPs) on the surface of pathogens?
- A. Toll-like receptors (TLRs)
  - B. Major histocompatibility complex (MHC) molecules
  - C. T-cell receptors (TCRs)
  - D. B-cell receptors (BCRs)
14. Which component of the innate immune response is involved in the formation of the membrane attack complex (MAC) to lyse pathogens?
- A. Antibodies
  - B. Natural killer cells
  - C. Complement system.
  - D. T cells
15. Which type of immune cell releases histamine and other chemical mediators in response to allergens or pathogens?
- A. Eosinophils
  - B. Basophils
  - C. Neutrophils
  - D. Dendritic cells.

16. The recommended immunization schedule for infants and young children includes vaccines for:
- A. Polio, tetanus, and measles
  - B. Influenza, hepatitis B, and pneumonia
  - C. Mumps, rubella, and varicella
  - D. Diphtheria, pertussis, and meningitis
17. Which of the following is NOT considered an innate barrier in the immune system?
- A. Skin
  - B. Mucus membranes
  - C. Antibodies
  - D. Cilia
18. The resolution phase of inflammation is characterized by:
- A. Prolonged tissue damage and scarring
  - B. Clearance of inflammatory cells and tissue repair
  - C. Activation of mast cells
  - D. Release of pro-inflammatory cytokines
19. The term "vaccine" is derived from the Latin word "*vacca*," which means:
- A. Virus
  - B. Bacteria
  - C. Cow
  - D. Disease
20. Which of the following is an example of a chemical barrier in innate immunity?
- A. Fever
  - B. Interferons
  - C. Complement proteins.
  - D. Tears containing lysozyme.
21. What is the role of cilia in the respiratory tract as an innate barrier?
- A. They produce mucus to trap pathogens.
  - B. They enhance phagocytosis.
  - C. They directly kill pathogens.
  - D. They move mucus and trapped pathogens out of the respiratory tract.
22. Which of the following is an example of an antigen-presenting cell (APC)?
- A. Neutrophils
  - B. Natural killer cells
  - C. B cells
  - D. Macrophages
23. Vaccine vial monitors (VVMs) are used to monitor:
- A. Vaccine storage temperatures
  - B. Vaccine expiration dates
  - C. Vaccine lot numbers

- D. Vaccine administration records
24. What is the function of complement proteins in the immune system?
- A. Production of antibodies
  - B. Activation of T cells
  - C. Phagocytosis of pathogens
  - D. Enhancement of microbial killing and inflammation.
25. The primary goal of vaccination is to:
- A. Cure diseases in infected individuals.
  - B. Treat symptoms of allergic reactions.
  - C. Prevent the occurrence of infectious diseases.
  - D. Reduce pain and inflammation in the body.
26. Rejection of a foreign skin graft is an example of
- A. destruction of virus-infected cells.
  - B. tolerance.
  - C. antibody-mediated immunity.
  - D. a secondary immune response.
27. To obtain immediate immunity against tetanus, a patient should receive
- A. an attenuated vaccine of *Clostridium tetani*.
  - B. a modified live vaccine of *C. tetani*.
  - C. tetanus toxoid.
  - D. a subunit vaccine against *C. tetani*.
28. A cell-mediated immune response Mucus-secreting membranes are found in
- A. the urinary system.
  - B. the digestive cavity.
  - C. the respiratory passages.
  - D. all of the above
29. T/F \_\_\_\_\_ Secretion of antibodies by activated B cells is a form of cell-mediated immunity.
30. Complement must be inactivated because if it were not,
- E. viruses could continue to multiply inside host cells using the host's own metabolic machinery.
  - F. necessary interferons would not be produced.
  - G. protein synthesis would be inhibited, thus halting important cell processes.
  - H. it could make holes in the body's own cells.

**SECTION II: SHORT ANSWER QUESTIONS**

**(20 MARKS)**

*Attempt ALL questions*

1. [4 Marks]: Why is antigen processing an essential prerequisite for an immune response?
2. [4 Marks]: Compare and contrast the four types of hypersensitivity.
3. [4 Marks]: List four types of cytokines.
4. [4 Marks]: Describe the primary and secondary organs of the lymphatic system
5. [4 Marks]: Contrast between primary and secondary immune responses

**SECTION III: LONG ANSWER QUESTION**

**(20 MARKS)**

*Attempt ANY TWO (2) questions*

1. [10 Marks]: Is it ethical to approve the use of a vaccine that causes significant illness in 1% of patients if it protects immunized survivors against a serious disease?
2. [10 Marks]: Name and describe the six stages of phagocytosis.
3. [10 Marks]: John received a chemical burn on his arm and was instructed by his physician to take an over-the-counter anti-inflammatory medication for the painful, red, swollen lesions. When Charles suffered pain, redness, and swelling from an infected cut on his foot, he decided to take the same anti-inflammatory drug because his symptoms matched John's symptoms. How is Charles's inflammation like that of John? How is it different? Is it appropriate for Charles to medicate his cut with the same medicine John used?

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