



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCES  
DEPARTMENT OF REHABILITATION MEDICINE  
BACHELOR OF SCIENCE IN PHYSIOTHERAPY  
END OF SEMESTER EXAMINATIONS  
AUGUST 2025 SERIES  
PHT 122: IMMUNOLOGY (MAIN EXAMINATION)  
DATE: 12<sup>TH</sup> AUGUST 2025. TIME: 2 HOURS  
START: 6PM FINISH: 8PM**

**INSTRUCTIONS:**

1. This examination is out of **70 Marks**.
2. The examination comprises of **THREE (3)** sections.
  - **Section I:** Multiple Choice Questions (30 Marks)
  - **Section II:** Short Answer Questions (20 Marks)
  - **Section III:** Long Answer Questions (20 Marks)
3. Attempt **ALL** Questions.
4. Do Not write on the question paper – for roughwork use the back of your booklet and cancel it out after finishing.

**SECTION I: MULTIPLE CHOICE QUESTIONS**

**(30 MARKS)**

*Attempt ALL questions*

1. The human papillomavirus (HPV) vaccine is an example of which type of vaccine?
  - A. Inactivated vaccine
  - B. Subunit vaccine
  - C. Live attenuated vaccine
  - D. Toxoid vaccine
2. Which of the following is NOT a class of immunoglobulins?
  - A. Ig A
  - B. Ig B
  - C. Ig M
  - D. Ig G
3. The World Health Organization (WHO) established an immunization program known as:
  - A. VACCINE (Vaccination for All Children in Need)
  - B. EPI (Expanded Program on Immunization)
  - C. IVI (International Vaccine Institute)
  - D. GAVI (Global Alliance for Vaccines and Immunization)
4. The major histocompatibility complex (MHC) molecules are crucial for:
  - A. Activation of B cells
  - B. Antibody production
  - C. Antigen presentation to T cells
  - D. Phagocytosis of pathogens
5. The process of antibody-mediated effector mechanisms is most effective against:
  - A. Intracellular bacteria
  - B. Extracellular viruses
  - C. Fungal infections
  - D. Extracellular bacteria and parasites
6. The acquired immune response is specifically activated in response to:
  - A. Allergens
  - B. Self-antigens
  - C. Pathogens or foreign substances
  - D. Inflammation
7. Helper T cells play a critical role in the immune response by:
  - A. Killing infected cells directly
  - B. Producing antibodies
  - C. Activating B cells and cytotoxic T cells
  - D. Phagocytosing pathogens

8. Which of the following cells is primarily responsible for the coordination of the acquired immune response?
- A. B cells
  - B. T cells
  - C. Natural killer cells
  - D. Macrophages
9. The primary function of B cells in the acquired immune response is to:
- A. Directly kill infected cells
  - B. Produce antibodies
  - C. Phagocytose pathogens
  - D. Activate T cells
10. The development of the vaccine for polio is credited to:
- A. Albert Sabin
  - B. Jonas Salk
  - C. Edward Jenner
  - D. Louis Pasteur
11. Which cells are NOT responsible for presenting antigens to T cells in the acquired immune response?
- A. Macrophages
  - B. B cells
  - C. Dendritic cells
  - D. Natural killer cells
12. The tetanus vaccine is an example of which type of vaccine.
- A. Inactivated vaccine
  - B. Subunit vaccine
  - C. Live attenuated vaccine
  - D. Toxoid vaccine
13. The differentiation of B cells into plasma cells leads to:
- A. Production of antibodies
  - B. Activation of T cells
  - C. Phagocytosis of pathogens
  - D. Inflammation
14. The process of herd immunity occurs when:
- A. A large proportion of the population is immune, reducing the spread of disease
  - B. Animals are vaccinated against zoonotic diseases
  - C. The immune system attacks healthy cells
  - D. Antibiotic resistance develops in pathogens
15. T helper cells are divided into two major subsets called:
- A. Th1 and Th2 cells
  - B. B cells and plasma cells

- C. Cytotoxic T cells and helper T cells
  - D. Memory T cells and naïve T cells
16. Which type of vaccine is made by inactivating the pathogen using chemicals or heat?
- A. Inactivated vaccine
  - B. Subunit vaccine
  - C. Live attenuated vaccine
  - D. Toxoid vaccine
17. How does normal flora contribute to innate barriers?
- A. They produce antibodies.
  - B. They directly kill pathogens.
  - C. They compete with pathogens for resources and colonization sites.
  - D. They induce inflammation.
18. Memory cells are an important component of the acquired immune response because they:
- A. Recognize self-antigens
  - B. Initiate inflammation
  - C. Provide long-lasting immunity
  - D. Produce cytokines
19. Vaccines work by stimulating the immune system to produce:
- A. Antibodies
  - B. Viruses
  - C. Bacteria
  - D. Antiviral drugs
20. Which of the following diseases was declared eradicated globally through vaccination efforts?
- A. Measles
  - B. Mumps
  - C. Tuberculosis
  - D. Smallpox
21. Antibodies can cross the placenta and provide passive immunity to the developing fetus. This process is mediated by:
- A. IgM antibodies
  - B. IgA antibodies
  - C. IgE antibodies
  - D. IgG antibodies
22. Which type of vaccine is made by using a modified toxin produced by the pathogen?
- A. Inactivated vaccine
  - B. Subunit vaccine
  - C. Live attenuated vaccine
  - D. Toxoid vaccine

- 23.** Which cells are responsible for phagocytosis in the innate immune response?
- A. T cells
  - B. B cells
  - C. Natural killer cells
  - D. Macrophages
- 24.** 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
- 25.** What is the role of lysozyme in innate immunity?
- A. It promotes inflammation.
  - B. It neutralizes bacterial toxins.
  - C. It destroys bacterial cell walls.
  - D. It enhances phagocytosis.
- 26.** 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
- 27.** How does the acidic pH of the stomach contribute to innate defense?
- A. It triggers the production of antibodies.
  - B. It directly kills pathogens.
  - C. It enhances the activity of natural killer cells.
  - D. It activates the complement system.
- 28.** Which cells are responsible for producing antimicrobial peptides as part of innate immunity?
- A. Neutrophils
  - B. Macrophages
  - C. Natural killer cells
  - D. Epithelial cells
- 29.** The acquired immune response is specifically activated in response to:
- A. Allergens
  - B. Self-antigens
  - C. Pathogens or foreign substances
  - D. Inflammation
- 30.** Antibodies can activate the complement system by:
- A. Enhancing antigen presentation to T cells
  - B. Binding to pathogens and recruiting complement proteins

- C. Directly killing infected cells
- D. Promoting vasodilation and increased vascular permeability

**SECTION II: SHORT ANSWER QUESTIONS** **(20 MARKS)**

*Attempt ALL questions*

- 31. [4 Marks] Explain how B cells contribute to adaptive immunity through antibody production.
- 32. [4 Marks] Describe the main types of vaccines used in immunization programs.
- 33. [4 Marks] Outline the role of vaccine efficacy and effectiveness in evaluating the success of immunization programs.
- 34. [4 Marks] Explain the concept of immunological memory in adaptive immune response.
- 35. [4 Marks] Describe how does the complement system contribute to innate immune responses.

**SECTION III: LONG ANSWER QUESTION** **(20 MARKS)**

*Attempt ANY TWO (2) questions*

- 36. [10 Marks] Discuss the role of helper T cells in coordinating adaptive immune responses.
- 37. [10 Marks] Discuss the key features and mechanisms of innate immunity, highlighting its importance in the early defense against pathogens.
- 38. [10 Marks] Discuss the challenges and strategies involved in achieving high vaccination coverage rates in different populations.

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