



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

UNIT CODE: PHT 122 UNIT NAME: IMMUNOLOGY (MAIN EXAM)

DATE: MONDAY/ 12TH/ AUGUST

TIME: TWO HOURS

START: 6PM STOP : 8PM

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

SECTION I: MULTIPLE CHOICE QUESTIONS

(30 MARKS)

Attempt ALL questions

1. Which of the following is **NOT** a component of the innate immune system?
 - A. Complement system
 - B. Adaptive immune cells
 - C. Phagocytes
 - D. Antimicrobial peptides
2. Which of the following is an inflammatory response triggered by the innate immune system?
 - A. Antibody production
 - B. Activation of T-helper cells
 - C. Vasodilation and increased vascular permeability
 - D. Memory cell formation
3. The term "*booster dose*" refers to:
 - A. An additional dose of a vaccine given to adults
 - B. A repeat dose of a vaccine given to maintain immunity
 - C. A vaccine dose that is given orally
 - D. A vaccine dose that is given via injection
4. 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
5. Which of the following is a key cytokine involved in the recruitment of immune cells to the site of infection or inflammation?
 - A. Interleukin-2 (IL-2)
 - B. Interferon-gamma (IFN-gamma)
 - C. Tumor necrosis factor-alpha (TNF-alpha)
 - D. Transforming growth factor-beta (TGF-beta)
6. 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
7. Which of the following is **NOT** a characteristic of innate immune responses?
 - A. Rapid response
 - B. Specificity for antigens

- C. Non-specific recognition
 - D. First line of defense against pathogens
8. The development of the vaccine for polio is credited to:
- A. Albert Sabin
 - B. Jonas Salk
 - C. Edward Jenner
 - D. Louis Pasteur
9. 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
10. 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
11. Vaccines work by stimulating the immune system to produce:
- A. Antibodies
 - B. Viruses
 - C. Bacteria
 - D. Antiviral drugs
12. 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
13. Which of the following diseases was declared eradicated globally through vaccination efforts?
- A. Measles
 - B. Mumps
 - C. Tuberculosis
 - D. Smallpox
14. 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
15. 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
16. The influenza vaccine is an example of which type of vaccine.
- A. Inactivated vaccine
 - B. Subunit vaccine
 - C. Live attenuated vaccine
 - D. Toxoid vaccine
17. Antibodies can mediate antibody-dependent cell-mediated cytotoxicity (ADCC) by:
- A. Killing infected cells directly
 - B. Activating T cells to produce cytokines
 - C. Binding to mast cells and releasing histamine
 - D. Coating target cells and facilitating their destruction by natural killer cells
18. 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
19. Antibodies can neutralize pathogens by:
- A. Activating complement proteins
 - B. Enhancing phagocytosis by macrophages
 - C. Binding to viral surface proteins and preventing entry into host cells
 - D. Inducing apoptosis in infected cells
20. Inflammation is a protective response triggered by the immune system in response to:
- A. Allergic reactions
 - B. Infection or injury
 - C. Autoimmune diseases
 - D. Chronic illnesses
21. 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)
22. The acquired immune response is specifically activated in response to:
- A. Allergens
 - B. Self-antigens
 - C. Pathogens or foreign substances
 - D. Inflammation
23. 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
- 24.** 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
- 25.** 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
- 26.** Which of the following is NOT a class of immunoglobulins?
- A.** Ig A
 - B.** Ig B
 - C.** Ig M
 - D.** Ig G
- 27.** 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
- 28.** 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
- 29.** 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
- 30.** The hallmark signs of acute inflammation include:
- A.** Fever and chills
 - B.** Fatigue and malaise
 - C.** Redness, swelling, heat, and pain
 - D.** Cough and shortness of breath

SECTION II: SHORT ANSWER QUESTIONS

(20 MARKS)

Attempt ALL questions

1. [4 Marks] Describe the concept of pathogen-associated molecular patterns (PAMPs) in innate immune recognition.
2. [4 Marks] Describe the process of vaccine administration and the common routes of vaccine delivery.
3. [4 Marks] Describe the process of antigen presentation in adaptive immune responses.
4. [4 Marks] Explain the functions of different subsets of T helper cells.
5. [4 Marks] Describe the role of phagocytes in innate immunity.

SECTION III: LONG ANSWER QUESTION

(20 MARKS)

Attempt ANY TWO (2) questions

1. [10 Marks] Discuss the role of helper T cells in coordinating adaptive immune responses.
2. [10 Marks] Discuss the key features and mechanisms of innate immunity, highlighting its importance in the early defense against pathogens.
3. [10 Marks] Discuss the challenges and strategies involved in achieving high vaccination coverage rates in different populations.

*******END*******