AMREF INTERNATIONAL UNIVERSITY

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF REHABILIATION MEDICINE

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

END OF TRIMESTER EXAMINATIONS JANUARY TO APRIL 2026

UNIT CODE: PHT 122

UNIT NAME: IMMUNOLOGY

DATE: 7th APRIL 2026

TIME: 11.15AM-1.15AM

INSTRUCTIONS

1. **All students will have two (2) hours to complete the examination**
2. **This is an online exam, Attempt all questions as per the instruction**
3. **It is the student's responsibility to report any page and number missing in this paper.**
4. **Check that the paper is complete**
5. **Total number of pages is 6 including the cover.**
6. **Read through the paper quickly before you start.**

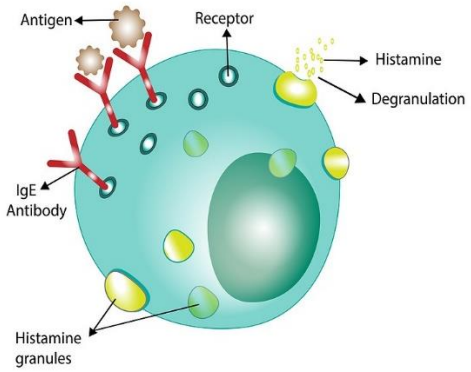
SECTION A. MULTIPLE CHOICED QUESTION (30 MARKS)

1. Pattern recognition receptors (PRR) include: (1 mark)

   A. LPS.
   B. PAMPS
   C. Lipoteichoic acid
   D. Lectin – like molecules

3. Which of the following statements is FALSE about a pathogen? (1 mark)
   A. A pathogen in the oldest and broadest sense is anything that that can produce disease.
   B. A pathogen is an infectious agent such as bacteria, a virus, protozoa, a fungus or other microscopic organisms.
   C. A pathogen can rapidly evolve and adapt, thereby avoid detection and neutralization by the immune system
   D. None of the above
3. Which of the following statements is true about leucocytes? (1 mark)

   A. These are the white blood cells
   B. Are the largest cells of the blood
   C. They are biconcave shaped and have no nucleus
   D. Measures about 7µm in diameter
4. Identify the cell shown in the image (1 mark)



   A. Mast cell
   B. Macrophage
   C. Basophil,

D. Eosinophil

5. Which of the following does not protect body surfaces? (1 mark)
   A. Mucus
   B. Gastric acid
   C. Salivary amylase
   D. Gut Microflora

7. Interferons: (1 mark)

   A. Are found only in mammalian species.
   B. Induce enzyme synthesis in the target cell.
   C. Only affect infected cells.
   D. Are specific for individual viruses.

8. Natural killer (NK) cells do not: (1 mark)
   A. Respond to interferon.
   B. Contain perforin.
   C. Kill only by damaging the target cell outer membrane.
   D. Contain serine proteases.

9. Eosinophils do not: (1 mark)

   A. Stain with basic dyes.
   B. Contain a major basic protein.
   C. Contain peroxidase.
   D. Give a respiratory burst on activation.

14. Polymorphonuclear neutrophils attack bacteria: (1 mark)
   A. Exclusively by oxygen-dependent mechanisms.
   B. Exclusively by oxygen-independent mechanisms.
   C. By phagocytosis.
   D. By secreting complement.

12. Acute inflammation can be initiated by: (1 mark)

   A. Mast cell activation.
   B. Influx of neutrophils.
   C. An increase in vascular permeability.
   D. Lysozyme.

13. A plasma cell secretes: (1 mark)

   A. Antibody of a single specificity related to that on the surface of the parent B-cell
   B. Antibody of two antigen specificities
   C. The antigen it recognizes

D. Many different types of antibody

14. Immunological unresponsiveness to self-antigens is called: (1 mark)

A. Tolerance
B. Memory
C. Acquired immunity
D. ADCC

15. Edward Jenner vaccinated against smallpox using: (1 mark)

A. Killed smallpox virus
B. A recombinant protein derived from smallpox
C. Toxoid
D. Cowpox

16. The function of memory B-cell is: (1 mark)

A. Antibody production
B. Immunologic memory
C. Regulate antibody production
D. None of the above

17. _____ refers an immune process where particles such as bacteria are targeted for destruction by an immune cell known as a phagocyte. (1 mark)

A. Neutralization
B. Opsonization
C. Cytotoxicity
D. Phagocytosis

18. A living microbe with reduced virulence that is used for vaccination is considered? (1 mark)

A. A toxoid
B. Denatured
C. Virulent
D. Attenuated

19. The specificity of an antibody is due to? (1 mark)

A. Its valence
B. The heavy chains
C. The Fc portion of the molecule
D. The variable portion of the heavy and light chain.
A. Hybridoma

20. _____ studies the relationship between the body systems, pathogens and immunity. (1 mark)

A. Clinical immunology
B. Classical immunology
C. Epidemiology
D. Immunotherapy

21. Neutrophils, eosinophils and basophils are also known as: (1 mark)

A. Platelets
B. Buffers
C. Astocytomas
D. Granulocytes

22. What is the name of the first cell recruited at the site of infection? (1 mark)
A. NK cells
B. Basophiles
C. Neutrophils
D. Macrophages

23. Cell mediated immunity is carried out by _____ and humoral immunity is carried out by_____. (1 mark)
A. B cell/T cell
B. Epitopes/Antigens
C. T cells/ B cells
D. Antibodies/antigens

24. B cells are activated by? (1 mark)
A. Complement
B. Antibody
C. Memory cells
D. Antigens

25. The peripheral level of the cold chain involves. (1 mark)

A. Manufacturing vaccines
B. National storage of vaccines
C. Transport from health facilities to outreach sites
D. Importation of vaccines

26. Which of the following is a CORRECT cold chain maintenance practice? (1 mark)

A. Store vaccines in the refrigerator door
B. Overload refrigerators
C. Keep vaccines in direct sunlight
D. Use the FEFO (first-expiry, first-out) principle

27. Which of the following is a feature of the primary immune response? (1 mark)

A. Very rapid onset
B. High antibody levels immediately
C. Long lag phase
D. Predominantly IgG production

28. Which antibody predominates in the secondary immune response? (1 mark)

A. IgM
B. IgG
C. IgD
D. IgE

29. What is the main function of immunological memory? (1 mark)

A. Destroy pathogens immediately
B. Produce only IgM antibodies
C. Ensure rapid and stronger response upon re-exposure
D. Reduce lymphocyte activity

30. Booster doses are given to: (1 mark)

A. Reduce vaccine cost
B. Replace primary doses
C. Strengthen and prolong immunity
D. Eliminate side effects

31. Which type of vaccine typically requires multiple doses and boosters? (1 mark)

A. Live attenuated vaccines
B. Inactivated vaccines
C. Herbal vaccines
D. DNA vaccines only

SECTION B **(20 MARKS)**

33. Describe the thymus as an organ of the immune system and its roles in immunity. (4 marks)

33. Draw a well labelled structure of immunoglobulin G (IgG). (4 marks)
34. Explain the implication of Rh factor (Rh D antigen) during child birth. (4 marks)
35. Enumerate FIVE applications of immunology in physiotherapy. (4 marks)
36. Explain the role of antibodies in ELISA. (4 marks)

SECTION C. ANSWER ANY TWO QUESTION BELOW **(20 MARKS)**

37. Discuss the cause, organs affected, symptoms and treatment of the following autoimmune disorders
    a. Lupus (5 marks)
    b. Rheumatoid arthritis (5 marks)

38. Discuss routes of administration of vaccines during clinical trials. (10 Marks)
39. Discuss mechanisms of action of innate immunity. (10 marks)