AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF REHABILITATION MEDICINE
BACHELOR OF SCIENCE IN PHYSIOTHERAPY
END OF SEMESTER EXAMINATIONS
DECEMBER 2024 SERIES
PHT 122: IMMUNOLOGY

(SUPPLEMENTARY/SPECIAL EXAMINATIONs)

TIME: 2 HOURS

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. 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.

2. 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*.

3. 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

4. T/F _____ Secretion of antibodies by activated B cells is a form of cell-mediated immunity.

5. 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.

6. Which of the following is not targeted by a Toll-like receptor?
   A. eukaryotic flagellar
   B. protein
   C. single-stranded RNA
   D. lipoteichoic acid

7. Which of the following diseases was declared eradicated globally through vaccination efforts?
   A. Measles
   B. Mumps
   C. Tuberculosis
   D. Smallpox

8. 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

9. 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

10. Which cells are responsible for phagocytosis in the innate immune response?
A. T cells
B. B cells
C. Natural killer cells
D. Macrophages

11. 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

12. 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.

13. 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

14. 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.

15. Which cells are responsible for producing antimicrobial peptides as part of innate immunity?
A. Neutrophils
B. Macrophages
C. Natural killer cells
D. Epithelial cells

16. The acquired immune response is specifically activated in response to:

A. Allergens
B. Self-antigens
C. Pathogens or foreign substances
D. Inflammation

17. 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

18. Which of the following binds iron?
A. lactoferrin
B. siderophores
C. transferrin
D. all of the above

19. An autoantigen is
A. an antigen from normal microbiota.
B. a normal body component.
C. an artificial antigen.
D. any carbohydrate antigen

20. Tc cells recognize epitopes only when the latter are held by
A. MHC proteins.
B. B cells.
C. interleukin 2.
D. granzyme.

21. Attenuation is
A. the process of reducing virulence.
B. a necessary step in vaccine manufacture.
C. a form of variolation.
D. similar to an adjuvant.

22. 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

23. The development of the vaccine for polio is credited to:
A. Albert Sabin
B. Jonas Salk
C. Edward Jenner
D. Louis Pasteur

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 tetanus vaccine is an example of which type of vaccine.

A. Inactivated vaccine
B. Subunit vaccine
C. Live attenuated vaccine
D. Toxoid vaccine

26. 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

27. 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

28. 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

29. 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

30. 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

SECTION II: SHORT ANSWER QUESTIONS (20 MARKS)

Attempt ALL questions

1. **[4 Marks]:** Distinguish among exogenous antigens, and autoantigens
2. **[4 Marks]:** Describe the advantages and disadvantages of five type of vaccines.
3. **[4 Marks]:** Differentiate primary from acquired immunodeficiencies and cite one disease caused by each form of immunodeficiency.
4. **[4 Marks]:** Describe the two classes of major histocompatibility complex (MHC) proteins with regard to their location and function.
5. **[4 Marks]:** List the different classes of immunoglobulins secrete in the body?

SECTION III: LONG ANSWER QUESTION (20 MARKS)

Attempt ANY TWO (2) questions

1. **[10 Marks]:** Describe apoptosis and explain its role in lymphocyte editing by clonal deletion.
2. **[10 Marks]:** Two students are studying for an exam on the body's defensive systems. One of them insists that complement is part of the nonspecific second line of defense, but the partner insists that complement is part of an antibody immune response in the third line of defense. How would you explain to them that they are both correct?
3. **[10 Marks]:** Human immunodeficiency virus (HIV) preferentially destroys CD4 cells. Specifically, what effect does this have on antibody and cell-mediated immunity?

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