



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
End of Semester December 2024 EXAMINATIONS**

COURSE CODE AND TITLE: BSN 223- Immunology

DATE: TUESDAY 3RD 2024

Duration: 2 HOURS

Start: 9:00 AM

Finish: 11:00 AM

INSTRUCTIONS

1. This exam is out of 70 marks
2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions (20 marks) Section II: Short Answer Questions (30 marks) and Section III: Long Answer Questions (20 marks)
3. Answer ALL Questions.
4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.

SECTION I: MULTIPLE CHOICE QUESTIONS**(20 MARKS)**

1. The following cells is involved in the presentation of antigens to T cells: -
 - A. Mast cells
 - B. Natural killer cells
 - C. Dendritic cells
 - D. Monocytes
2. The main function of the complement system in the immune response: -
 - A. Antigen presentation
 - B. Phagocytosis
 - C. Antibody production
 - D. Cell lysis and inflammation
3. The primary function of regulatory T cells (Tregs) in the immune system: -
 - A. Antibody production
 - B. Cytotoxicity against infected cells
 - C. Immune memory formation
 - D. Suppression of excessive immune responses
4. The following sources is not associated with Pathogen-Associated Molecular Patterns (PAMPs): -
 - A. Bacterial products
 - B. Viral products
 - C. Exogenous substances from inert sources
 - D. Fungal products
5. The immunoglobulin is the most abundant in serum and is involved in secondary immune responses: -
 - A. IgA
 - B. IgE
 - C. IgG
 - D. IgM
6. Which cytokine is involved in the activation of cytotoxic T cells and natural killer (NK) cells: -
 - A. Interleukin-2 (IL-2)
 - B. Tumor necrosis factor-alpha (TNF- α)
 - C. Interferon-gamma (IFN- γ)
 - D. Interleukin-4 (IL-4)
7. _____ is the unique set of antigenic determinants of the variable of an immunoglobulin molecule.
 - A. Paratope
 - B. Idiotype
 - C. Idiotope
 - D. Isotype

8. A cytokine is involved in the differentiation of B cells into plasma cells for antibody production: -
- A. Interleukin-2 (IL-2)
 - B. Tumor necrosis factor-alpha (TNF- α)
 - C. Interferon-gamma (IFN- γ)
 - D. Interleukin-4 (IL-4)
9. In the context of transplantation, what is graft-versus-host disease (GVHD) : -
- A. Rejection of a transplanted organ
 - B. Immune response against self-antigens
 - C. Immune attack by transplanted cells against the host
 - D. Development of autoantibodies
10. The immunodeficiency disorder is characterized by a lack of B and T lymphocytes, resulting in severe combined immune deficiency: -
- A. DiGeorge syndrome
 - B. X-linked agammaglobulinemia
 - C. Common variable immunodeficiency (CVID)
 - D. Wiskott-Aldrich syndrome
11. The type of immune cell is most directly involved in the destruction of intracellular pathogens, such as viruses, through the release of perforins and granzymes: -
- A. B cells
 - B. Cytotoxic T cells
 - C. Helper T cells
 - D. Macrophages
12. A 35-year-old female experiences joint pain, swelling, and morning stiffness lasting more than 30 minutes. Rheumatoid factor and anti-cyclic citrullinated peptide (anti-CCP) antibodies are elevated. What autoimmune disorder is likely present; -
- A. Systemic lupus erythematosus (SLE)
 - B. Rheumatoid arthritis
 - C. Sjögren's syndrome
 - D. Polymyositis
 - E. Ankylosing spondylitis
13. The term for the process by which immune cells are attracted to and migrate toward a site of infection or inflammation: -
- A. Opsonization
 - B. Chemotaxis
 - C. Anaphylaxis
 - D. Hypersensitivity
14. An adjuvant: -
- A. Increases the size of the immunogen
 - B. enhances the immunogenicity of haptens
 - C. increases the chemical complexity of the immunogen
 - D. enhances the immune response to the immunogen

15. The main function of MHC class II molecules in antigen presentation is: -
- A. Presentation of endogenous antigens to cytotoxic T cells
 - B. Presentation of exogenous antigens to helper T cells
 - C. Presentation of viral antigens to natural killer cells
 - D. Activation of complement system
16. The DNA for an H chain in a B-cell making IgG2 antibody for diphtheria toxoid has the following structure: 5'-V17D5J2 C γ 2-C γ 4-C ϵ -C α 2-3'. How many individual rearrangements were required to go from the embryonic DNA to this B-cell DNA: -
- A. 1
 - B. 2
 - C. 3
 - D. 4
17. In immunology, what is the term for the process by which antibodies enhance the phagocytosis of pathogens by immune cells?
- A. Opsonization
 - B. Chemotaxis
 - C. Anaphylaxis
 - D. Hypersensitivity
18. The migration of leukocytes from blood circulation into the tissues where there is an infection following chemical signals is known as: -
- A. Extravasation
 - B. Chemotaxis
 - C. Tropism
 - D. Diapedesis
19. The term for the process by which immune cells recognize self-antigens and are eliminated is: -
- A. Tolerance
 - B. Sensitization
 - C. Immunization
 - D. Hyperreactivity
20. A 28-year-old male presents with a pruritic rash with silvery scales on the elbows and knees. What autoimmune disorder is suggested by these skin findings?
- A. Psoriasis
 - B. Dermatomyositis
 - C. Systemic sclerosis
 - D. Vitiligo

SECTION II: SHORT ANSWER QUESTIONS**(30 MARKS)**

21. Briefly explain the FOUR (4) major characteristics of the adaptive immune response. (8 marks)
22. Explain three (3) complement system pathways and in each pathway name the trigger substance (6 marks)
23. State four (4) fates of Self-reactive B cells (4 marks)
24. Explain three(3) effector mechanisms of the activated T cell? (6 marks)
25. Outline TWO (2) molecules, found on pathogens and damaged tissues, that are recognized by innate immune cells through Toll-like receptors (TLR). (2 marks)
26. Outline FOUR (4) main antigen presenting cells in the human body. (4 marks)

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

27. Hypersensitivity is an exaggerated immune response following exposure to antigen;-
 - a. Discuss the four (4) types of hypersensitivity reactions. (12 marks)
 - b. Explain four (4) Triggers of the hypersensitivity reactions above (8 marks)