



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
END OF SEMESTER AUGUST 2024 EXAMINATIONS**

COURSE CODE AND TITLE: BSN 223-BSM 223- IMMUNOLOGY

DATE:

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 cell is involved in the presentation of antigens to T cells;-
 - A. Mast cells
 - B. Natural killer cells
 - C. Dendritic cells
 - D. Monocytes
2. The primary function of regulatory T cells (Tregs) in the immune system is;-
 - A. Antibody production
 - B. Cytotoxicity against infected cells
 - C. Immune memory formation
 - D. Suppression of excessive immune responses
3. The following source is not associated with Pathogen-Associated Molecular Patterns (PAMPs);-
 - A. Bacterial products
 - B. Viral products
 - C. Exogenous substances from inert sources
 - D. Fungal products
4. The cytokine involved in the activation of cytotoxic T cells and natural killer (NK) cells is;-
 - A. Interleukin-2 (IL-2)
 - B. Tumor necrosis factor-alpha (TNF- α)
 - C. Interferon-gamma (IFN- γ)
 - D. Interleukin-4 (IL-4)
5. The immunoglobulin that is most abundant in serum and is involved in secondary immune responses is;-
 - A. IgA
 - B. IgD
 - C. IgE
 - D. IgG
6. In the context of immunology, what is the term for the process by which immune cells recognize self-antigens and are eliminated;-
 - A. Tolerance
 - B. Sensitization
 - C. Immunization
 - D. Hyperreactivity
7. The main function of the complement system in the immune response is;-
 - A. Antigen presentation
 - B. Phagocytosis
 - C. Antibody production
 - D. Cell lysis and inflammation
8. _____ is the unique set of antigenic determinants of the variable of an immunoglobulin molecule.
 - A. Paratope

- B. Idiotype
 - C. Idiotope
 - D. Isotype
9. The cytokine involved in the differentiation of B cells into plasma cells for antibody production is;-
- A. Tumor necrosis factor-alpha (TNF- α)
 - B. Interferon-gamma (IFN- γ)
 - C. Interleukin-4 (IL-4)
 - D. Interleukin-10 (IL-10)
10. Graft-versus-host disease (GVHD) refers to;-
- A. Rejection of a transplanted organ
 - B. Immune response against self-antigens
 - C. Immune attack by transplanted cells against the host
 - D. Allergic reaction to the graft
11. The immunodeficiency disorder characterized by a lack of B and T lymphocytes, resulting in severe combined immune deficiency is;-
- A. DiGeorge syndrome
 - B. X-linked agammaglobulinemia
 - C. Wiskott-Aldrich syndrome
 - D. Severe combined immunodeficiency (SCID)
12. The type of immune cell most directly involved in the destruction of intracellular pathogens, such as viruses, through the release of perforins and granzymes is;-
- A. B cells
 - B. Cytotoxic T cells
 - C. Helper T cells
 - D. Macrophages
13. The immune cells are attracted to and migrate toward a site of infection or inflammation through;-
- 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. Enhances the immune response to the immunogen
 - D. Enhances immunologic cross-reactivity
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?
- 1
 - 2
 - 3
 - 4
17. Antibodies enhance the phagocytosis of pathogens by immune cells through;-
- Opsonization
 - Chemotaxis
 - Anaphylaxis
 - Hypersensitivity
18. 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. The likely autoimmune disorder is;-
- Systemic lupus erythematosus (SLE)
 - Rheumatoid arthritis
 - Sjögren's syndrome
 - Ankylosing spondylitis
19. A 28-year-old male presents with a pruritic rash with silvery scales on the elbows and knees. The likely autoimmune disorder is suggested by these skin findings is;-
- Psoriasis
 - Dermatomyositis
 - Vitiligo
 - Bullous pemphigoid
20. The cell where clonal expansion occurs following their direct interaction with the antigen is;-
- Macrophages
 - B cells
 - T cells
 - mast cells

SECTION II: SHORT ANSWER QUESTIONS (30 MARKS)

- Draw the structure of an immunoglobulin (5 marks)
- State four (4) first line of defense in immunology (4 marks)
- Name four (4) secondary lymphoid organs (4 marks)
- State three (3) complement system pathways and in each pathway name the trigger substance (6 marks)
- Outline two (2) differences in antigen recognition by B and T cells (4 marks)
- Briefly enumerate four (4) steps in anamnestic response (4 marks)
- Outline three (3) ways antibodies contribute to immunity (3 marks)

SECTION III: LONG ANSWER QUESTION – (20 MARKS)

1. Immune system play a significant role in protecting an individual against infections;-
 - a) Define hypersensitivity (1mark)
 - b) Discuss three types of hypersensitivity reactions. (9 marks)
 - c) Explain how immunological memory is developed starting from administration of vaccine-oral polio vaccine (OPV) to a child. (10maks)

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