FACULTY	HEALTH SCIENCES AND VETERINARY MEDICINE		
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UNIVERSITY OF NAMIBIA

FIRST OPPORTUNITY EXAMINATION

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This Question Paper consists of **SIX (6)** pages including this front page

Instructions

Answer all questions

SECTION A: MULTIPLE CHOICE QUESTIONS **[20 MARKS @ 1 mark each]**

1. Phagocytes are present in blood and tissues throughout the body. Which of the following types of phagocytic cells are normally found circulating in blood?
    a. Dendritic cells and neutrophils
    b. Kupffer cells and monocytes
    c. Mast cells and monocytes
    d. Neutrophils and monocytes
2. Strongly immunogenic tumours appear:
    a. In virtually all cancers
    b. Only in lymphoma and leukaemia
    c. In immunosuppressed patients
    d. Only in experimental animals
3. A graft between members of the same species is termed a (an):
    a. Autograft.
    b. Isograft.
    c. Xenograft.
    d. Allograft.
4. Type IV hypersentivity is often referred to as:
    a. Immediate
    b. Delayed
    c. Anaphylactic
    d. Allotypic
5. A potential disadvantage of immunological protection using passive transfer of horse globulins is:
    a. Serum sickness
    b. Weak immune protection
    c. Lack of antibody-mediated immune response
    d. Type IV hypersensitivity reactions
6. The mucosal surfaces of the body are initially protected by free:
    a. Immunoglobulins class G
    b. Immunoglobulins class M
    c. Immunoglobulins class E
    d. Immunoglobulins class A
7. The level of antigens:
    a. Is unrelated to the intensity of the immune response
    b. Is related to the intensity of the immune response
    c. Never has an effect on the response to a T-independent antigen
    d. Has no effect on the concentration of MHC bound processed antigen
8. CD8 is a marker of:
    a. B-cells

b. Helper T-cells
c. Cytotoxic T-cells
d. An activated macrophage

9. Which of the following lymphoid tissues is unencapsulated?
    a. Thymus
    b. Lymph node
    c. Mucosal-associated lymphoid tissue (MALT)
    d. Tonsil
10. An epitope:
    a. Is the area on an antigen which contacts antibody
    b. Is the area on an antibody which contacts antigen
    c. Requires both antigen-binding arms of the antibody molecule for its recognition
    d. Is usually associated with a concave region of the antigen.
11. Protection against microorganisms inside cells is provided by:
    a. T-cells
    b. Antibody
    c. C3b
    d. The membrane attack complex
12. The classical and alternative pathways meet at complement component:
    a. C4
    b. C4b
    c. C3
    d. C5
13. Acute inflammation can be initiated by:
    a. Mast cell activation
    b. Influx of neutrophils
    c. An increase in vascular permeability
    d. Lysozyme
14. There are five classes of immunoglobulins. The type of antibody secreted varies between anatomic locations. Which of the following is the predominant immunoglobulin that defends against microbial invasion in the upper respiratory tract?
    a. Immunoglobulin class A
    b. Immunoglobulin class D
    c. Immunoglobulin class G
    d. Immunoglobulin class M
15. Which of the following describes negative selection of immature B cells?
    a. B cells that receive signals through the pre-B cell receptor survive and continue development.
    b. B cells that can adequately recognize foreign antigen are signalled to continue development.

c. B cells that can adequately recognize self-antigen are signalled to continue development
d. B cells that recognize self-antigen are signalled to die by apoptosis.

16. The term humoral immunity applies to
    a. Antibody-mediated immunity
    b. Cell-mediated immunity
    c. Adaptive immunity
    d. Naturally acquired immunity
17. Rejection of a foreign skin graft is an example of:
    a. Destruction of virus-infected cells
    b. Cell-mediated immune response
    c. Antibody-mediated immunity
    d. Secondary immune response
18. A secondary immune response:
    a. Occurs after several months
    b. Has a very short lag period
    c. Is mediated by cells
    d. Only occurs against toxoids
19. A macrophage is a tissue-based version of which other cell?
    a. Neutrophil
    b. Eosinophil
    c. Mast cell
    d. Monocyte
20. A virus infects a cell's cytoplasm. Which of the following immune response components could deal with this problem?
    a. Antimicrobial peptides
    b. Antibodies
    c. NK Cells
    d. Phagocyte

SECTION B: TRUE/FALSE, FILL IN AND MATCHING QUESTIONS [20 MARKS]

(a) True/False questions [10 marks @ 1 mark each]

1. Intracellular bacteria are eliminated from the immune system mainly by humoral immune mechanisms.
2. Cellular immunity plays a key role in protection against viruses.
3. Phagocytosis is a process involving NK cells and cytotoxic T lymphocytes.
4. At the primary immune response against bacteria and viruses, specific IgG antibodies appear in the patient's serum.
5. The receptors are highly specific in the adaptive, but not in the innate immune response.

6. Passive immunization activates the immune system and generates memory response.
7. Vaccines must be stored in the fridge in their original packaging.
8. Haptens can react specifically with their corresponding antibodies.
9. In the complement fixation test the absence of haemolysis is considered as a positive test, while the haemolysis of erythrocytes is indicative of a negative test
10. Leukaemia, lymphoma, and myeloma are malignant tumours of haematopoietic cells of the bone marrow.

(b) Fill in the blanks in the questions **[10 marks @ 1 mark each]**

1. Central tolerance refers to the destruction of antibodies that are ..... for self-antigens.
2. Primary immunodeficiencies are also called ..... immunodeficiencies.
3. Type I hypersensitivity is also known as ..... or ..... hypersensitivity.
4. Unlike the other types of hypersensitivity, type IV hypersensitivity is a type of ..... response.
5. "Germ-free" animals are also known as ..... animals (GA).
6. In bovine tuberculin test, tuberculin can be injected either on the ....., or in the .....
7. A failure of clonal deletion leads to ..... (development of self-reactive lymphocytes)
8. In veterinary medicine, transplantation is mostly done in .....

SECTION C: SHORT ANSWER QUESTIONS [20 MARKS]

QUESTION 1. Name the 3 pathways of complement protein activation. [3]

QUESTION 2. Describe the origin of the word "complement system". [2]

QUESTION 3. Define the following terminologies: [6]

a. Cross reactivity of an antibody [2]

b. Affinity of antibody [2]

c. Left shift or blood shift in white blood cell count. [2]

QUESTION 4.

Hypersensitivity type III is also known as immune complex disease. Name three (3) organs in which these immune complexes can be deposited. [3]

QUESTION 5.

Name three (3) types of canine pruritic dermatoses which are associated with hypersensitivity. [3]

QUESTION 6.
Give three (3) examples of adjuvants normally used in the formulation of inactivated vaccines. [3]

SECTION C. STRUCTURED QUESTIONS **[60 MARKS]**

QUESTION 1. **[10 marks]**

A. Give the advantages and disadvantages of inactivated (killed) vaccines. [8]

A. A toxoid vaccine is prepared from a….. (harmful product) made by the germ that causes a disease. Give an example of toxoid vaccine used in horses. [2]

QUESTION 2. **[10 marks]**

(a) Outline any five (5) functions of antibodies to protect the body [5]

(b) Name five (5) steps followed in vaccine production [5]

QUESTION 3. **[10 marks]**

Outline the general features of immunity to microbial pathogens.

QUESTION 4. **[10 marks]**

(a) Briefly describe the good and bad sides of inflammation. [5]

(b) Define a "hapten" and name two (2) fungal antigens. [5]

QUESTION 5. **[10 marks]**

a. Give five (5) factors which may be at the basis of immunodeficiency in neonates. [5]

b. With regard to the complement, give the extension of the term "MAC" and summarize the functions of the complement [5]

QUESTION 6. **[10 marks]**

Namibia is divided into three foot and mouth disease (FMD) control zones. Name them and state how FMD vaccination to control the disease is carried out in each zone.

END OF EXAM PAPER