

CANDIDATE NUMBER.....

*"Investing in Africa's Future"***COLLEGE OF HEALTH, AGRICULTURE AND NATURAL
SCIENCES****DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES****BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS****END OF SECOND SEMESTER EXAMINATIONS****NSLS208: IMMUNOLOGY****APRIL/MAY 2023****LECTURER: MR G. MALUNGA****DURATION: 3 HOURS*****INSTRUCTIONS***

1. Write your candidate number on the space provided on top of each page
2. Answer **all** questions in sections A on the question paper.
3. Answer **all** questions in section B on separate answer sheets provided.
4. Answer any **3** questions in section C on separate answer sheets provided
5. The mark allocation for each question is indicated at the end of the question
6. Credit will be given for logical, systematic and neat presentations in sections B and C

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SECTION A: MULTIPLE CHOICE [40 MARKS]

- **Answer all questions by encircling the correct response T for TRUE or F for FALSE for each statement in all the questions**
- **Each correct response is allocated half mark**

1. Cells involved in phagocytosis production include

- T F a) Macrophages
T F b) Dendritic cells
T F c) Endothelial cells
T F d) Neutrophils

2. Which of the following is associated with active immunity

- T F a) Exposure to an antigen
T F b) Infusion of weakened viruses
T F c) Movement of IgG antibodies from a pregnant mother to her fetus
T F d) All of the above

3. Cells of the humoral immunity include

- T F a) Macrophages
T F b) NK cells
T F c) T_h cells
T F d) Neutrophils

4. The following are key cells of innate immunity

- T F a) Phagocytes
T F b) B cells
T F c) Natural killer cells
T F d) T helper cells

5. Functions of pathogen recognition receptors include

- T F a) Opsonisation
T F b) Complement activation
T F c) Antibody production
T F d) Trigger cytokine release

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6. The following refers to the lymph node and spleen

- T F a) The lymph node filters antigens out of the blood.
- T F b) Afferent lymphatic vessels draining the tissue spaces enter the spleen
- T F c) Both the lymph node and spleen contain germinal centers
- T F d) The paracortex is rich in T cells

7. Methods of antigen-antibody detection include

- T F a) Precipitation
- T F b) Radioimmunoassays
- T F c) Agglutination
- T F d) PCR

8. Helper T cells receive antigens from

- T F a) Macrophages
- T F b) MHC II
- T F c) Viruses
- T F d) Bacteria

9. The following refers to antibodies

- T F a) IgM participate in antigen trapping
- T F b) IgG do not activate the complement
- T F c) IgA participate in phagocytosis
- T F d) IgD act as antigen receptors on naive B cells

10. The following are cell separation techniques

- T F a) Flow cytometry
- T F b) Centrifugation
- T F c) Immunoaffinity
- T F d) Adherence

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11. The interaction between antibody and antigen can be detected by
- T F a) agglutination
 - T F b) Polymerase chain reaction (PCR)
 - T F c) Rapid plasma reagin
 - T F d) precipitation
12. The T Cell Receptor
- T F a) consists of α and β chains only
 - T F b) can also be secreted
 - T F c) act only as a receptor
 - T F d) doesn't have a constant region
13. The following are immunodiffusion methodologies
- T F a) precipitation
 - T F b) immunoelectrophoresis
 - T F c) Ouchterlony disc assay
 - T F d) PCR
14. The following factors affect immunoassays
- T F a) ionic strength of buffer
 - T F b) gel pore size
 - T F c) incubation temperature
 - T F d) strength of electrical current
15. Regarding the complement
- T F a) C5a is an important opsonizing molecule
 - T F b) C3b has chemotactic function
 - T F c) C3a may cause mast cell degranulation
 - T F d) cytolysis of bacteria cannot occur in the absence of immune complexes

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16. Regarding immunohistochemistry

- | | | |
|---|---|---|
| T | F | a) Fluorescent substances are sometimes used |
| T | F | b) Enzyme label on antibody is reacted with a substrate |
| T | F | c) The direct method of immunohistochemical staining uses one labelled antibody |
| T | F | d) The indirect method of immunohistochemical staining uses one antibody labeled with avidin-biotin complex |

17. Antibody titer refers to the

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|---|---|--|
| T | F | a) Absolute amount of specific antibody. |
| T | F | b) Affinity of specific antibody. |
| T | F | c) Avidity of specific antibody. |
| T | F | d) Concentration of specific antibody. |

18. Latex particles are commonly used in:

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|---|---|----------------------------|
| T | F | a) Agglutination tests. |
| T | F | b) Affinity chromatography |
| T | F | c) Affinity measurements |
| T | F | d) Adjuvants |

19. The following are autoimmune disorders

- | | | |
|---|---|-------------------------|
| T | F | a) Multiple sclerosis |
| T | F | b) SLE |
| T | F | c) Rheumatoid arthritis |
| T | F | d) SCID |

20. The following assay(s) involve(s) separation of antigens by size on a gel, followed by diffusion and precipitation

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| T | F | a) Indirect immunosorbent assay |
| T | F | b) Flow cytometry |
| T | F | c) Double diffusion immunoassay |
| T | F | d) Immunoelectrophoresis |

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SECTION B [20 MARKS]**Answer all questions on separate answer sheets provided**

1. Describe the functions of the following facets of innate immunity
 - a) Opsonisation [2]
 - b) Complement system. [2]
 - c) Inflammation [2]
 - d) Phagocytosis [2]
2. What are the differences between acute inflammation and chronic inflammation? [4]
3. Write short notes on the following immunoglobulins (Ig)
 - a) IgA [2]
 - b) IgE [2]
 - c) IgM [2]
 - d) IgG [2]

SECTION C [75 marks]**Answer any 3 questions from this section on separate answer sheets provided**

1. Describe the process of phagocytosis. [25]
2. Discuss the differences between acute inflammation and chronic inflammation. [25]
3. Describe how endogenous antigens are processed. [25]
4. Give an analysis of hypersensitivity reactions. [25]
5. Explain the principles of the following immunological techniques
 - a) Immunochromatography. [10]
 - b) ELISA. [15]