



## UNIVERSITY EXAMINATIONS

**FIRST YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF  
BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCE  
SECOND SEMESTER 2022/2023  
[JAN - APRIL, 2023]**

### **MELS 143: IMMUNOLOGY**

**STREAM: Y1 S2**

**TIME: 3 HOURS**

**DAY: THURSDAY, 2:00-5:00 P.M.**

**DATE: 30/03/2023**

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#### **INSTRUCTIONS**

- 1. Do not write anything on this question paper.***
- 2. Answer ALL questions in Section A and B (Compulsory). In section C, Answer question ONE (Compulsory) and any other questions.***

#### **SECTION A**

- Edward Jenner vaccinated against smallpox using:
  - Killed smallpox virus
  - Recombinant protein derived from smallpox
  - Toxoid
  - Cowpox
- Which one of the following is an attribute of the innate, rather than the adaptive (acquired), arm of our host defenses?
  - Is highly specific in its response to individual bacterial species
  - Responds to viruses and fungi, but not bacteria
  - Exhibits memory following exposure to bacteria
  - Is as effective the first time it is exposed to bacteria as it is subsequent times
- Humoral immunity is a type of adaptive immunity that results in the circulation of which of the following throughout the blood?
  - Antigens
  - Macrophages
  - Natural killer cells
  - Antibodies
- Artificially acquired passive immunity refers to immunity from,
  - Recognition of an antigen by B cells

- b) Injection of antigen in a vaccination
  - c) IV injection of immunoglobulins
  - d) Recognition of an antigen by T cells
5. Which of the following cell types of the innate system does not perform phagocytosis?
- a) Neutrophils
  - b) Basophils
  - c) Macrophages
  - d) Eosinophils
6. The presence of IgM indicates
- a) Activated B cells
  - b) A recent exposure has taken place
  - c) An allergic reaction is present
  - d) A reaction between mother and foetus across the placenta
7. What is the normal immunological role of the CD8+ve T-cell?
- a) Helps B-lymphocytes to develop into plasma cells.
  - b) Kills virus infected cells.
  - c) Secretes antibodies.
  - d) Rejects transplanted tissue.
8. The two identical light chains of an antibody belong to
- a) Kappa only
  - b) Lambda only
  - c) Either lambda or kappa
  - d) None of these
9. B and T cells are produced by stem cells that are formed in:
- a) Bone marrow
  - b) The liver
  - c) The spleen
  - d) The lymph nodes
10. Immunoglobulin classes must be distinguished by the type of:
- a) light chains they possess.
  - b) carbohydrate on their light chains.
  - c) constant regions in their light chains.
  - d) heavy chains they possess
11. Innate host defense mechanisms are critical to the protection of the body because:
- a) They utilize pre-committed antigen presenting cells that have already been induced
  - b) The antibodies derived from the innate response are critical to neutralize bacterial toxins.
  - c) They are highly specific for the invading pathogens that avoid PAMP receptor recognition.

- d) They provide immediate, continuous protection in absence of a specific immune response.
12. Which one of the following statements concerning leukocytes is correct?
- a) All phagocytes are granulocytes.
  - b) No cells of the innate immune system are lymphocytes
  - c) Eosinophils are reactive against invasive helminthic infections
  - d) Neutrophils have a longer lifespan than macrophages
13. Which of the following cell types or systems is **not** part of an innate immune response to a pathogen?
- a) Phagocytes
  - b) Natural killer cells.
  - c) The inflammatory response.
  - d) Cytotoxic T-lymphocytes
14. Immunological unresponsiveness to self-antigens is called:
- a) Tolerance
  - b) Tolerogen
  - c) Memory
  - d) Acquired immunity
15. A plasma cell secretes:
- a) Antibody of a single specificity related to that on the surface of the parent B-cell
  - b) Antibody of two antigen specificities
  - c) The antigen it recognizes
  - d) Many different types of antibodies
16. A deficiency of which one of the following complement components predisposes to bacteremia caused by members of the genus *Neisseria*?
- a) C1
  - b) C3b
  - c) C5b
  - d) C5b,6,7,8,9
17. Interferons are vital in immunity since they act as;
- a) Cytokine barriers
  - b) Physical barriers
  - c) Cellular barriers
  - d) Physiological barriers
18. What distinguishes helper T-cells from cytotoxic T-cells
- a) Helper cells recognize antigen complexed with MHC class I molecules
  - b) Cytotoxic cells recognize antigen complexed with MHC class I molecules
  - c) Cytotoxic cells recognize antigen complexed with MHC class II molecules
  - d) There is no distinction between the two types of cell.

19. Killer T-cells effect their killing by:
- Antibodies with specific recognition capabilities
  - Inserting the complement components C9, into the target cell membrane
  - The T- cell antigen receptor and Class MHC proteins
  - Inserting a pore forming protein called perforin into the target cell membrane'
20. The following cellular components are from the lymphoid series, which one is not?
- Natural killer cells
  - Erythrocytes
  - B cells
  - T cells

**SECTION B: Answer ALL the structured questions in this section. (20 marks)**

- Highlight four barriers of first line defense in innate immunity (4 marks)
- Tabulate differences in primary and secondary immune responses  
(4marks)
- Outline four types of vaccines according to their methods of preparation  
(4 marks)
- Explain the immunological importance of multiple layers of dead cells on the skin?  
(4marks)
- State four pathogen elimination mechanisms used by complement system  
(4 marks)

**SECTION C: INSTRUCTIONS: Answer question one compulsory and any other one from the two questions in this section. (Total 30 marks)**

- Describe
  - Manifestation cardinal signs during inflammation (10 marks)
  - Development and importance of fever (5 marks)
- Describe exogenous (extracellular) antigen processing and presentation  
(15 marks)
- Discuss the mechanism and consequences of Type-I hypersensitivity  
(15 Marks)