(*University of Choice*)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

(MAIN CAMPUS)

UNIVERSITY EXAMINATIONS 2018/2019 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER END OF SEMESTER EXAMINATIONS

FOR

1. THE BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES

2. THE BACHELOR OF SCIENCE IN HUMAN NUTRITION AND DIETETICS

COURSE CODE: BML 226
COURSE TITLE: IMMUNOLOGY

DATE: 24TH MAY 2019 **TIME: 3.00 -5.00 PM**

INSTRUCTIONS:
ANSWER ALL QUESTIONS IN ALL SECTIONS

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Amongst early diseases that formed a basis for the global vaccine development milestone is
    (a) Polio
    (b) Smallpox
    (c) Measles
    (d) Plagues

2. Identify an agent involved in the support of bone microenviroment activitiese is
    (a) Lectins
    (b) SDF 12
    (c) Haemocyanin
    (d) Stromal antigen 6

3. One of the major PALS components is
    (a) Lymphocytes
    (b) Antigens
    (c) Macrophages
    (d) NK cells

4. PRR examples include
    (a) Scavenging receptors
    (b) Immunogenic lipoproteins
    (c) Mannose receptors
    (d) Glycan receptors

5. An exemplary complement system activation products is
    (a) C4d
    (b) dgC3b
    (c) C3a
    (d) C5bi

6. Select an inflammatory mediator that is CORRECTLY matched with an inflammatory function
    (a) Endogenous pyrogen interleukin 1 –promote vascular permeability
    (b) Histamines – raise core temperature
    (c) Eicosanoids – promote fever and vasodilation
    (d) Heparin – promotes coagulation

7. All the following are bone marrow microenvironment components support the multipluripotent haematopoietic stem cell (MPHSC) EXCEPT
    (a) Chemoattractants

(b) Cytokines

(c) Growth factors

(d) Extracellular matrix molecules

8. The lymphoid organ in which B lymphocytes precursors undergo full processing to maturity is

(a) The thymus gland

(b) The lymph node

(c) The spleen

(d) The bone marrow

9. Identify cellular products that originate from the common myeloid progenitor

(a) Natural killer cells

(b) T lymphocytes

(c) B lymphocytes

(d) Monocytes

10. The following statements are true of the spleen EXCEPT

(a) It acts as a platelet storage center, storing 30% of the bodies platelet content

(b) Its germinal centers are involved in immunoglobulin M synthesis

(c) Its periarteriolar lymphoid sheath is the site of red blood cell destruction

(d) It has a stagnant blood flow and an almost glucose free environment

11. The specialised receptor that binds antigens on the B lymphocyte membrane is called

(a) The T cell receptor

(b) CD 4

(c) Notch 1 receptor

(d) mIg

12. Natural killer cells release the following microbicidal agent called

(a) The membrane attack complex

(b) Vitronectin

(c) Perforin

(d) Decay accelerating factor

13. Which one of the following complexes forms the alternative pathway C5 convertase

(a) C3bBb

(b) C4b2a3b

(c) C3bBbC3bP

(d) C4b2a

14. The reason why the complement cascade's activation on red blood cells (as opposed to microbial surfaces) is limited is

(a) Due to the presence of the decay accelerating factor
(b) Regulation by C1 inhibitor
(c) Due to the presence of limiting factors H and I
(d) Due to the presence of the membrane cofactor protein

15. Select the unconventional T cell subtype that straddles the border between innate (by have PRRs) and adaptive (by developing memory phenotype) immunity
(a) Suppressor / regulatory T cells
(b) Gamma delta T cells
(c) Cytotoxic T cells
(d) Helper T cells

16. Identify a cellular product that DOES NOT arise from the common lymphoid progenitor from MPHSCs
(a) Neutrophils
(b) Natural Killer (NK) cells
(c) B lymphocytes
(d) T lymphocytes

17. Select an aspect which is NOT associated with B lymphocyte mediated immunity
(a) Differentiated B cells called plasma cells secrete immunoglobulins
(b) Memory B lymphocytes are responsible for the rapid humoral responses during future antigenic encounters
(c) They have cytoplasmic granules that release alpha defensins with microbicidal effects
(d) The B lymphocytes circulate in lymphoid tissues such as the spleen and lymph nodes

18. The cell surface molecule that is important in the presentation of extracellular antigenic peptides to helper T lymphocytes is
(a) MHC class I
(b) Kit ligand
(c) MHC class II
(d) Membrane-bound IgD

19. Identify an INCORRECT statement concerning immunodeficiencies
(a) They can be caused by aging
(b) They are all acquired during a person's lifetime
(c) Obesity, alcoholism and drug use can lead to immunodeficiencies
(d) Poor diet and thymectomy at an early age can lead to immunodificiencies

20. Select a statement that is TRUE concerning ELISA
(a) Its functions can equally be performed by the X ray crystallographer
(b) Can be used to detect both antigen and antibodies
(c) It is commonly used due to the easy affordability of its reagents
(d) It is crucial in hybridoma technology

SECTION B: SHORT ANSWER QUESTIONS [40 MARKS]

1. Describe the basic immunoglobulin structure **(5 marks)**

2. Outline the markers of T cell and macrophage activation **(5 marks)**

3. Describe four functions of the lymph node as a lymphoid organ **(4 marks)**

4. Describe four forms of mechanical surface barriers that aid in preventing entry of microbes into the body **(4 marks)**

5. Examine the differences between the innate and adaptive immune systems **(4 marks)**

6. Outline any four characteristics of immunoglobulin M **(4 marks)**

7. With appropriate examples, describe what autoimmunity entails **(4 marks)**

8. Briefly explain why the engagement of the TCR-CD 3 complex by the MHC-antigen complex alone does not activate the CD 4+ T cells **(4 marks)**

9. Give mechanisms involved in the regulation of the complement biochemical pathways **(5 marks)**

10. What is haemaglutionation inhibition **(4 marks)**

SECTION C: LONG ANSWER QUESTIONS [40 MARKS]

1. What are adjuvants **(10 marks)**

2. Describe B-cell mechanisms that ultimately lead to antibody production **(10 marks)**

3. Discuss the cluster of differentiation (CD) molecules (20 marks)