



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

INSTITUTION BASED PROGRAMME (DECEMBER SESSION)

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

(MEDICAL LABORATORY SCIENCES)

HML 108: BASIC IMMUNOLOGY

DATE: THURSDAY, 3RD MAY 2012

TIME: 8.00 A.M. – 10.00 A.M.

SECTION A: ANSWER ALL QUESTIONS (5 MARKS EACH)

1. Describe the salient characteristic of adaptive immunity. (5 marks)
2. a) Due to genetic defects, a person X has no antibodies and a person Y has no T lymphocytes. Which person is more likely to succumb to:
 - (i) influenza;
 - (ii) diphtheria;
 - (iii) malignant myeloma? (3 marks)
- b). Distinguish between an immunogen and an antigen (2 marks)
3. Describe the properties of immunoglobulin A (IgA) (5 marks)

SECTION B: ANSWER ONLY ONE QUESTION (20 MARKS EACH)

4. Discuss the body's innate defence mechanism. (20 marks)
5. Discuss the various activation pathways of complement (20 marks)

SECTION C: ANSWER ALL QUESTIONS BY CIRCLING THE CORRECT ONE (½ MARKS EACH)

- 1-When neutrophils and macrophages squeeze out of capillaries to fight off infection it is called:
 - A) phagocytosis
 - B) hemolysis
 - C) interleukin
 - D) diapedesis
 - E) folliculitis
- 2-During a great battle between your WBC's and an aggressive microbe, an inflammatory response has been initiated. Redness and edema has kicked in what else does the body do to protect itself?
 - A) Histamine cause vasodilation
 - B) Hypothalamus raises the thermostat
 - C) Neutrophils engulf and destroy the microbe
 - D) Living and dead WBC and bacteria accumulate
 - E) All of the above
- 3-Specificity and memory are associated with which body defense mechanism?
 - A) inflammatory response
 - B) phagocytosis by macrophages and neutrophils
 - C) interferon
 - D) T cell and B cell responses
 - E) anatomical barriers in the body
- 4-An additional chemical defense found in tears and saliva?
 - A) T lymphocytes
 - B) saline
 - C) lysozyme
 - D) EFC
 - E) Sulfuric acid

- 5-Which of the following does complement protein perform
- A) They cause antibody release
 - B) T cell development
 - C) The release if histamine
 - D) Promotes tissue repair
 - E) Mast cell degranulation
- 6-Which substance induces fever?
- A) Pyrogen
 - B) Pus
 - C) Monocytes
 - D) Oedema
 - E) Interferon
- 7-Major function(s) of the lymphatic system is/are?
- A) provide route for return of extracellular fluid
 - B) act as drain off for inflammatory response
 - C) render surveillance, recognition , and protection against foreign materials via lymphocytes, phagocytes, and antibodies.
 - D) a and c
 - E) all of the above
- 8-An antigen is:
- A) a chemical messenger that is released by virus infected cells
 - B) a lymphocyte responsible for cell-mediated immunity
 - C) something that coats the inside of lungs, causing infection
 - D) a protein or other molecule that is recognized as non-self
 - E) a thick yellow-white fluid
- 9-A foreign substance, usually a protein, that stimulates the immune system to react, such as by producing antibodies is a _____.
- A) allergen
 - B) antigen
 - C) histamine
 - D) mast cell
 - E) interferon
- 10-When a macrophage ingests an invading bacteria and takes the antigen to a lymph node, what happens next?
- A) the macrophage will present it to the first B-cell it encounters, and the B-cell will in turn change its surface receptors to match the antigen
 - B) a B-cell will only become activated if it already has a match for the antigen
 - C) a matching B-cell will become activated into a cytotoxic T-cell
 - D) the cells of the lymph node will release histamine
 - E) the lymph node will increase production of neutrophils
- 11-What is the most common portal of entry for diseases, into the body?
- A) Respiratory system
 - B) Endocrine system
 - C) Hematacrit system
 - D) Any opening into the body.
 - E) Lymphatic system

12-This gland shrinks in size during adulthood, and has hormones that function in maturation of T-lymphocytes:

- A) lymph nodes
- B) thymus
- C) spleen
- D) GALT
- E) tonsils

13-Which of the following is not a mechanical factor to protect the skin and mucous membranes from infection?

- A) Layers of cells
- B) Tears
- C) Saliva
- D) Lysozyme
- E) None of the above

14-Where is the site of maturation for a B cell?

- A) thymus
- B) bone marrow
- C) pancreas
- D) cortex
- E) nucleus

15-Nonspecific resistance is

- A) The body's ability to ward off diseases.
- B) The body's defenses against any kind of pathogen
- C) The body's defense against a particular pathogen.
- D) The lack of resistance.
- E) None of the above.

16. In the classical pathway of complement activation, C3 convertase is

- A C4b2a
- B C3bBb
- C C4b2a3b
- D C3bBb3b
- E. C5-9

17. The fragment that does not belong to the anaphylatoxin is

- A C3a
- B C3b
- C C4a
- D. C5a
- E. C2a

18. The fragment involves in the opsonization is

- A C3a
- B C3b
- C C4a
- D.C5
- E. C5-9

19.Factors that influence immunogenicity include:

- A foreignness

- B molecular size
 - C chemical composition
 - D all above
 - E. None of the above
20. Which one of the following anatomical regions is most likely to show a predominance of T lymphocytes?
- A. A periarteriolar sheet in the spleen
 - B. A Peyer's patch in the small intestine
 - C. A tonsillar follicle
 - D. The bone marrow
 - E. The germinal center of a lymph node follicle
21. A patient born without the human bursa equivalent would be expected to have normal:
- A. Cellularity in the paracortical areas of the lymph nodes
 - B. Differentiation of germinal centers in the lymph nodes
 - C. Numbers of circulating lymphocytes bearing surface immunoglobulins
 - D. Numbers of plasma cells in the bone marrow
 - E. Tonsils
22. Where are cells expressing both CD4 and CD8 found?
- A. Spleen
 - B. Thymus
 - C. Bone marrow
 - D. Placenta
 - E. Dermis
23. The class-specific antigenic determinants of immunoglobulins are associated with the:
- A. J chain
 - B. T chain
 - C. H chain
 - D. L chain
 - E. Secretory component
24. A newborn's repertoire of antibodies is shown to include all those listed below. Which one is most likely to have been synthesized by the newborn?
- A. IgG1 anti-Rh
 - B. IgG2 anti-human immunodeficiency virus (HIV)
 - C. IgG3 anti-tetanus toxoid
 - D. IgG4 anti-*Haemophilus influenzae* type b
 - E. IgM anti-toxoplasma
25. Which of the following procedures is *less* likely to enhance antigenicity?
- A. Chemical polymerization of the antigen
 - B. High-speed centrifugation to eliminate aggregates
 - C. Immunization on antigen obtained from a phylogenetically distant species to that of the animal immunized
 - D. Injection of an antigen-adjuvant emulsion
 - E. Intradermal injection
26. The antigen-binding sites of an antibody molecule are determined by the structure

of the:

- A. Constant region of heavy chains
 - B. Constant region of light chains
 - C. Variable region of heavy chains
 - D. Variable region of light chains
 - E. Variable regions of both heavy and light chains
27. A preparation of pooled normal human IgG injected into rabbits will *not* induce the production of antibodies against:
- A. Gamma heavy chains
 - B. Gamma 3 heavy chains
 - C. J chain
 - D. Kappa light chains
 - E. Lambda light chains
28. The most abundant immunoglobulin class in serum is
- A IgA
 - B IgG
 - C IgM
 - D IgE
 - E. IgD
29. The most efficient Ig involved in the classical pathway of complement activation is
- A IgA
 - B IgG
 - C IgM
 - D IgE
 - E. IgD
30. In the classical pathway of complement activation, C3 convertase is
- A C4b2a
 - B C3bBb
 - C C4b2a3b
 - D C3bBb3b
 - E. C5-9
