



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2022/2023 ACADEMIC YEAR

2ND YEAR TRIMESTER 2 EXAMINATIONS

FOR THE DEGREE OF

BACHELOR OF SCIENCE IN NURSING

COURSE CODE: NCD 133

COURSE TITLE: IMMUNOLOGY

DATE: 08TH APRIL 2024

TIME: 11:30AM- 2:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER ALL QUESTIONS

TIME: 3 HOURS

MMUST observes ZERO tolerance to examination cheating
SECTION A
MULTIPLE CHOICE QUESTIONS (60 MARKS) Please Turn Over.

CHOOSE THE CORRECT RESPONSE
EACH QUESTION IS ONE MARK

1. Which of the following accurately describes normal changes of aging of the immune system?
 - A. The older adult has decreased susceptibility to infections.
 - B. Older adults have increased tear production.
 - C. Older adults have increased production of saliva and gastric secretions.
 - D. The thymus gland decreases in size and activity with age.
2. The technique of assisting the body to develop immunity by way of injecting a diluted antigen, in a series of injections of increasing strength, over a 1- to 3-year period is known as:
 - A. Immunization
 - B. Immunotherapy
 - C. Vaccination
 - D. Anaphylaxis
3. The most effective treatment for a hypersensitivity disorder is:
 - A. Symptom management
 - B. Environmental control
 - C. Immunotherapy
 - D. Taking a detailed and thorough history
4. The highest priority nursing diagnosis for the patient experiencing anaphylaxis is:
 - A. Anxiety
 - B. Breathing pattern, ineffective
 - C. Impaired tissue perfusion
 - D. Impaired thought processes
5. Which of the following are accurate statements regarding latex allergies?
 - A. Fifty percent of health care workers regularly exposed to latex are sensitized.
 - B. Type IV contact dermatitis is a response to natural rubber latex proteins that occurs within minutes of contact.
 - C. Using oil-based creams or lotions prior to donning gloves is recommended.
 - D. A person with a latex allergy should be taught to wear a medic alert bracelet and carry an epinephrine pen
6. Autoimmune disorders fall into which category of "inappropriate responses of the immune system?"
 - A. Hyperactive responses against environment antigens
 - B. Inability to protect the body

- A. Antibodies to lyse cells via the C8 and C9 components
- B. The major histocompatibility complex for cell recognition
- C. Antibodies to opsonize cells
- D. Antibodies to lyse cells via the perforin molecules

13. T-cell antigen receptors are distinguished from antibodies by which of the following

- A. T-Cell receptors are glycosylated
- B. T-cell receptors must interact with antigen uniquely presented by other cells but not with free antigen
- C. T-Cell receptors bind various cytokines
- D. T-Cell receptors bind complement to lyse cells

14. T-cell receptors or antibodies react with antigens

- A. Because both are made by lymphocytes
- B. Because of complementary of molecular fit of both with antigen
- C. Because both have light chain and heavy chain polypeptides
- D. Facilitate perforin release

15. All of the following are TRUE of antigen except?

- A. They contain epitopes.
- B. They will react with antibodies.
- C. They can elicit an immune response.
- D. They contain paratopes.

16. All of the following are true with respect to IgE molecules, EXCEPT which one?

- A. They are the principal immunoglobulin class involved in allergic reactions.
- B. They are involved in mediating anti-parasitic immune responses.
- C. They will cross the placenta and fix complement.
- D. They are the least abundant immunoglobulin in the serum.

17. Which of the following immunoglobulins is present normally in plasma at the highest concentration?

- A. IgG
- B. IgM
- C. IgA
- D. IgD

- C.Failure to recognize the body as self
- D.Attacks on beneficial foreign tissue

7.Monocytes move from the systemic circulatory system into general connective tissues, where they differentiate into what phagocytic cell type?:

- A. Macrophage
- B.T cell
- C.B cell
- D.Neutrophil

8.Humoral immunity is a type of adaptive immunity that results in the circulation of which of the following throughout the blood?

- A.Antigens
- B.Natural killer cells
- C.Antibodies
- D.Macrophages

9.All of the following are TRUE with respect to IgM antibodies EXCEPT which one

- A.They fix complement
- B.They predominate in the primary response to antigen
- C.They mediate allergic reaction
- D.They are monomeric

10.One principal function of complement is to

- A.Mediate the release of histamine
- B.Bind antibodies attached to cell surfaces and cause cell lysis
- C.Cross link allergens
- D.Opsonize antibodies

11.One principal function of the Class I and Class II major histocompatibility complex S proteins is to

- A.Transduce the signal to the T-cell interior following antigen binding
- B.Mediate immunoglobulin class switching
- C.Present antigen for recognition by the T-cell antigen receptor
- D.Bind complement

12.The major role of the complement system is to work in conjunction with

- A. Have a thin layer of cytoplasm
- B. Are derived from T-cells
- C. Develop into B-cells
- D. Have a highly developed rough endoplasmic reticulum

41. Specific antibodies are readily detectable in serum following primary contact with antigen after:

- A. 10 min
- B. 5–7 days
- C. 3–5 weeks
- D. Only following a second contact with antigen

42. 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 antibody

43. Adoptive transfer of acquired immune responsiveness involves the transfer of:

- A. Antibody
- B. Complement
- C. Phagocytes
- D. Lymphocytes

44. Immunological unresponsiveness to self antigens is called:

- A. Tolerance
- B. Tolerogen
- C. Memory
- D. Acquired immunity

45. Edward Jenner vaccinated against smallpox using

- A. Killed smallpox virus
- B. A recombinant protein derived from smallpox
- C. Toxoid
- D. Cowpox

46. Intracellular parasites within macrophages are killed more readily in the presence of:

- A. Antibody
- B. Kinins

- C. Properdin
- D. Gamma-interferon

47. T cell surface receptors for antigen partly recognize:

- A. Cytokines
- B. MHC
- C. ADCC
- D. Antibody

48. An immune response against grass pollen often involves:

- A. Pathogen-associated molecular patterns
- B. Breakdown of self tolerance
- C. A hypersensitivity reaction
- D. Reaction against MHC

49. Secondary antibody responses are better because:

- A. They provide defense against unrelated antigens
- B. The antibody can be made by both T and B cells
- C. Complement-fixing antibodies are made
- D. They are stronger and faster

50. Which cell type produces antibodies?:

- A. Macrophages
- B. T-lymphocytes
- C. NK
- D. Plasma cells

51. The secondary, but not the primary, immune response is based on:

- A. Memory
- B. The bonus effect of multivalency
- C. Complement activation
- D. Clonal selection

52. Protection against microorganisms inside cells is provided by:

- A. T-cells
- B. Antibody
- C. C3b
- D. The membrane attack complex

53. The basic Ig unit is composed of:

- A. 2 identical heavy and 2 identical light chains.
- B. 2 identical heavy and 2 different light chains.
- C. 2 different heavy and 2 identical light chains.
- D. 2 different heavy and 2 different light chains

54. Which of the following statements does not apply to IgG?:

- A. Appears early in the primary immune response.
- B. Neutralizes bacterial toxins.
- C. Can fix complement.
- D. Crosses the human placenta

55. IgD:

- A. Is pentameric.
- B. Is resistant to proteolytic degradation.
- C. Is present mainly as a surface receptor on B-cells.
- D. Is abundant in milk

56. IgE:

- A. Is abundant in saliva.
- B. Binds strongly to mast cells.
- C. Cannot bind to macrophages.
- D. Activates the complement cascade.

57. The first immunoglobulin heavy chain class to be expressed on the surface of a newly produced B-cell is:

- A. IgA
- B. IgD
- C. IgG
- D. IgM

58. NK cells lack receptors with:

- A. Specificity for MHC class II molecules.
- B. Specificity for MHC class I molecules.
- C. C-type lectin domains.
- D. Immunoglobulin-like domains

59. MHC class II molecules are found on:

- A. Virtually all cells in the body.
- B. B cells, dendritic cells and macrophages.
- C. Only gamma-interferon activated cells.
- D. Virtually all nucleated cells in the body.

60. Which of the following statements is incorrect? Affinity is:

- A. A measure of the strength of the binding of antigen to antibody.
- B. The association constant of the Ag/Ab equilibrium.
- C. Avidity.
- D. Related to specificity

SECTION B

SHORT ANSWER QUESTIONS (20 MARKS)

1. Explain the four (4) types of hypersensitivity reactions (8 marks)
2. State the three complement pathways (6 marks)
3. Mention any four (4) founding fathers of immunology listing their discoveries (6 marks)

SECTION C

LONG ANSWER QUESTIONS (20 MARKS)

1. Describe the production of antibodies (20 marks)

18. All of the following are true about antibodies, EXCEPT which one?

- A. They fix complement.
- B. They occur on the surface of B-lymphocyte
- C. They predominate the primary immune response to antigen.
- D. They are molecule with a single, defined amino acid sequence.

19. The major immunoglobulin family to which a particular immunoglobulin belongs can be determined by sequential analysis of the 110 amino acids beginning from the

- A. Amino terminus of the light chain.
- B. Carboxy terminus of the light chain.
- C. Amino terminus of the heavy chain.
- D. Carboxy terminus of the heavy chain.

20. The immunoglobulin Joining chain (J-chain) is

- A. Only produced by T-Cells
- B. Only produced by neutrophils
- C. Associated with only multimeric forms of IgM and IgA
- D. Associated with IgE for histamine release

21. All of the following are true EXCEPT

- A. An epitope is a small portion of a macromolecule
- B. The variable region domains contain the antigen recognition site
- C. An antigenic determinant is a paratope
- D. The class of an immunoglobulin is determined by its heavy chain

22. Which immunoglobulin is the principal one found in secretions such as milk?

- A. IgG
- B. IgM
- C. IgA
- D. IgD

23. Individuals unable to make the J protein found in certain immunoglobulins would be expected to

have frequent infections of the

- A.Blood.
- B.Liver.
- C.Pancreas.
- D.Intestinal tract.

24. Which of the following statements best characterizes an antibody?

- A.An antibody is composed of protein and cannot be distinguished from the albumin fraction of the serum proteins.
- B.An antibody is composed of four identical protein subunits which may be caused to dissociate by treatment with urea.
- C.An antibody contains protein as its major chemical component and its synthesis may be elicited by the administration of a foreign protein or polysaccharide.
- D.An antibody contains mucopolysaccharides as its major chemical component and the synthesis of these may be elicited by the administration of a foreign protein or polysaccharide.

25.The immunoglobulin class which is the least abundant in the normal adult is

- A.IgG
- B.IgM
- C.IgD
- D.IgE.

26.Class switching of immunoglobulins occurs

- A.Usually with booster immunizations, going from IgM to IgG
- B.Binds complement
- C.Causes the histamine release
- D.Mediates immunoglobulin class switching

27.When a B-cell undergoes immunoglobulin class switching

- A.The variable region of the light chain changes, but its constant region remains the same
- B.The variable region of the light chain remains the same, but its constant region changes
- C.The variable region of the heavy chain remains the same but its constant region changes
- D.The variable region of the heavy chain changes but its constant region remains the same

28. The class of an immunoglobulin

- A. Is determined by Class I and Class II major histocompatibility complex proteins
- B. Is determined by the carbohydrate attached to the light chain
- C. Is determined by the antigen
- D. Is determined by the heavy chain type

29. A graft between members of the same species is termed an:

- A. Autograft
- B. Isograft
- C. Xenograft
- D. Allograft

30. Which one of the following statements is FALSE regarding rejection of a second (set) skin graft from the same allogeneic donor:

- A. Can be blocked by azathioprine (an antimitotic agent).
- B. Proceeds at the same speed as the first graft rejection.
- C. Shows specificity for the graft donor.
- D. Can be transferred to a naive recipient with lymphocyte

31. The human major histocompatibility complex:

- A. Provokes the most intense allograft reactions
- B. Contains only class I and class II genes
- C. Is not expressed as codominant antigens on the cell surface
- D. Encodes the human leukocyte antigens (HLA) expressed only on leukocytes

32. Which one of the following is a primary lymphoid organ:

- A. Lymph nodes
- B. Spleen
- C. Tonsil
- D. Thymus

33. Which of the following does not protect body surfaces:

- A. Skin.
- B. Mucus.
- C. Gastric acid.
- D. Salivary amylase

34. The mononuclear phagocyte system does not include:

- A. Monocytes.
- B. Kupffer cells
- C. Lymph node medullary macrophages.
- D. Endothelial cells

35. A polymorphonuclear neutrophil (PMN):

- A. Is a bone marrow stem cell.
- B. Contains microbicidal cytoplasmic granules.
- C. Is not a professional phagocytic cell.
- D. Has granules which stain with eosin

36. The initial complement component that is bound by complement-fixing antibodies is:

- A. C1q
- B. C1s
- C. C3b
- D. C5a

37. Several of the complement components are:

- A. Cytokines
- B. Enzymes
- C. Hormones
- D. Antibodies

38. The classical and alternative pathways meet at complement component:

- A. C4
- B. C4b
- C. C5
- D. C3

39. Clonal selection occurs when antigen is encountered by:

- A. Neutrophils
- B. Mast cells
- C. T-cells
- D. Basophils

40. Plasma cells: