



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN MEDICAL SCIENCES

AML 2209: MEDICAL IMMUNOLOGYII

END OF SEMESTER EXAMINATION

SERIES:AUGUST2019

TIME:2HOURS

DATE:Pick DateAug2019

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **TWO**Section(s). Attempt**ALL** questions.

Circle the correct answer in section A.

Section A

1. Which of the following is the fundamental property of the normal immune system?
 - a) Specificity
 - b) Diversity
 - c) Memory
 - d) Self tolerance

2. Which of the following is a major factor that contributes to the development of autoimmunity?
 - a) Infections
 - b) B cell responses
 - c) Cytokine production
 - d) Innate immune stimulation

3. Which of the following is not responsible for tissue injury in different autoimmune diseases?
 - a) Circulating Autoantibodies
 - b) Immune complexes
 - c) Autoreactive T cells
 - d) Autoreactive NK cells

4. Which of the following explain why once an autoimmune disease has developed, it tends to be chronic and often progressive?
 - a) Receptor editing
 - b) Antigenic variation
 - c) Epitope spreading
 - d) Antigen masking

5. Which of the following cells turn on the acquired immune system by activating T-Helper cells?
 - a) The T cytotoxic cells
 - b) CD4 cells
 - c) B cells
 - d) Antigen presenting cells

6. The T_h cells activate which arm of the immune system?
 - a) Innate immunity
 - b) Humoral and cell mediated immunity
 - c) Antibody mediated immunity only
 - d) Cell mediated immunity only

7. Which of the following statement is not true about the memory cells
 - a) Memory cells produce antibodies that bind with greater affinity to their antigens than the antibodies produced in the initial response.
 - b) The response time is much faster than the primary response
 - c) A greater number of antibodies are produced.
 - d) Memory cells produce antibodies that bind with weaker affinity to their antigens than the antibodies produced in the initial response.

8. The stem of the antibody molecule and the lower portion of the arms is called?
 - a) Variable region
 - b) Constant region
 - c) Fab region
 - d) Epitope

9. Eosinophil's express receptors for which class of antibodies?
 - a) IgA
 - b) IgD
 - c) IgG
 - d) IgE

10. Which of the following antibodies is found on the surface of mature B-cells?
 - a) IgA
 - b) IgD
 - c) IgG
 - d) IgE

11. Which of the following statement is not true about T-Independent Antigens
- Antibody production does not require assistance from T cells.
 - TH cells stimulate B cells specific for that antigen to become plasma cells
 - Antigens are mainly polysaccharides or lipopolysaccharides with repeating subunits.
 - Weaker immune response than for T-dependent antigens.
12. The variable region of the T cell receptor is made of?
- α and β chain
 - Kappa and lambda chains
 - $M\mu$ chains
 - γ chains
13. Which of the following statements is not true about B and T cell receptors?
- Antibodies can be both soluble and membrane bound, TCR only membrane Bound
 - TCR has one binding site, Ab has two
 - TCR is shorter and wider than Fab portion of Ab
 - Antibodies have weaker affinity than TCRs
14. Which of the following is not a factor that influence immunogenicity?
- Molecular weight
 - Immunosuppression
 - Age
 - Chemical composition
15. A patient presents with symptoms suggestive of autoimmune hemolytic anemia. A direct Coombs test is positive. Which of the following is a correct interpretation of the test?
- The patient has autoantibodies in her serum that are directed against her own red blood cells.
 - The patient has anti-Ig antibodies in her serum.
 - The patient's red blood cells have autoantibodies bound to the surfaces.
 - The patient has complement-fixing autoantibodies bound to her red blood cells.
16. A patient presents with an increased number of lymphocytes in his peripheral blood. Which of the following is an appropriate technique to differentiate the lymphocytes?
- Enzyme-linked immunosorbent assay (ELISA).
 - Radioimmunoassay (RIA).
 - Western blotting.
 - Flow cytometric analysis.
17. A patient's serum is mixed with a known concentration of antigen for the detection of specific antibodies, and this reaction is measured by precipitate formation. As the serum is diluted stepwise 1:1 with phosphate-buffered saline, the strength of the reaction increases rather than decreases. This is probably due to which of the following?
- The presence of cross-reactive antibodies.
 - Multiple epitopes on the antigen.
 - The presence of polyclonal antibodies.
 - Prozone effect.

18. The single best defining description of the classical pathway of complement activation is:
- a) It produces a C5 convertase
 - b) It generates the membrane attack complex (MAC)
 - c) It results in the splitting of C3 into C3a and C3b
 - d) It utilizes complement component C1r
19. The antibody molecule is held together by _____ bonds.
- a) Disulfide
 - b) Hydrogen
 - c) Amino acid
 - d) Sodium
20. The process whereby neutrophils and other white blood cells are attracted to an inflammatory site is called _____.
- a) Diapedesis
 - b) Chemotaxis
 - c) Margination
 - d) Phagocytosis
21. The only T cells that can directly attack and kill other cells are the _____.
- a) Regulatory cells
 - b) Helper cells
 - c) Cytotoxic cells
 - d) Plasma cells
22. B lymphocytes develop immune-competence in the _____.
- a) Thymus
 - b) Spleen
 - c) Bone marrow
 - d) Lymph nodes
23. The ability of the immune system to recognize self-antigens versus non-self-antigen is an example of:
- a) Specific immunity
 - b) Tolerance.
 - c) Cell mediated immunity
 - d) Humoral immunity
24. Which of the following substances will not stimulate an immune response unless they are bound to a larger molecule?
- a) Antigen
 - b) Virus
 - c) Hapten
 - d) Miligen

25. Which of the following is NOT true about graft vs host reaction?
- a) It often occurs in immunocompromised hosts
 - b) The host rejects the allogeneic cells in the graft
 - c) Occurs when solid transplanted organs contain large numbers of T cells
 - d) Reactions are directed against minor histocompatibility antigens of the host
26. Which of the following does not explain why immune responses often fail to prevent the growth of tumors?
- a) Too few cells initiate tumors
 - b) Only a few tumor antigens may be recognized as foreign
 - c) The tumors grow too fast
 - d) The tumors have specialized ways of evading the immune system
27. Which of the following is true of tumor associated antigens?
- a) They are expressed on tumor cells only
 - b) They are expressed on tumor cells and also on normal cells
 - c) They are the major inducers of tumor immunity
 - d) They are the promising candidates for tumor vaccines
28. Which of the following cell types is the principal adaptive defense mechanism against tumors?
- a) NK cells
 - b) NKT cells
 - c) Macrophages
 - d) CD8+ T cells
29. The gene responsible for ataxia telangiectasia is located on which of the following chromosomes?
- a) 1
 - b) 5
 - c) 8
 - d) 11
30. Ataxia telangiectasia is characterized by the following except?
- a) Abnormal gait
 - b) Neurologic deficits
 - c) Increased incidence of tumors
 - d) Cardio malformations
31. HIV disease progresses to AIDS under which of the following?
- a) CD4+ T cell count drops below 300 cells/mm³
 - b) CD4+ macrophages count drops below 300 cells/mm³
 - c) CD4+ T cell count drops below 200 cells/mm³
 - d) CD4+ Macrophages count drops below 200 cells/mm³

32. Immunological tolerance is generated through the recognition of antigens by which of the following cells?
- Neuronal cells
 - Lymphocytes
 - M cells
 - RBCs
33. The following are factors that favor stimulation of immune responses except?
- Prolonged persistence of antigens
 - High levels of co-stimulators on APCs
 - Optimal doses of antigens
 - Antigens with adjuvants
34. Activation of tissue APCs in the presence of an infectious microbe resulting in responses that are not specific for the infectious pathogen is called?
- Primary activation
 - Secondary activation
 - Bystander activation
 - Principal activation
35. The aim of using anti-inflammatory drugs in treating autoimmune diseases is to
- Activate inflammation
 - Reduce tissue injury
 - Neutralize infections
 - Prevent rejection
36. The acronym ELISA stands for
- Especially Liked in Systemic Analysis
 - Enzyme Liked Immuno-sorbent Analysis
 - Enzyme Linked Immuno-Spot Assay
 - Enzyme Linked Immuno-sorbent Assay
37. Western blotting is used to
- Determine the relative quantity of a protein
 - Determine the sequence of a protein
 - Determine the migration ability of a protein
 - Determine the separation power of a gel

38. Which of the following is a disadvantage of using a fluorescence microscope?

- a) Requires highly skilled manpower
- b) It is used to detect fluorescent labeled antibody
- c) Has low signal to noise ratio
- d) Needs labeled enzymes to work

39. The parents of a child with X-linked agammaglobulinemia (Bruton's agammaglobulinemia) give a family history of a male cousin dying following vaccination. Which vaccine could have caused this catastrophic result?

- a) Diphtheria
- b) oral polio vaccine (Sabin)
- c) hepatitis B vaccine
- d) pertussis vaccine

40. Which of the following may be used to activate T cells polyclonally?

- a) Rapamycin
- b) Phytohemagglutinin
- c) Neuraminidases
- d) Anti-inflammatory drugs

Section B

41. a) Draw a well labelled diagram of an antibody (10 marks)

b) State four general features of immunodeficiency diseases (10 marks)

42. a) Describe two causes of hypersensitivity diseases (8 marks)

b) Explain four ways by which the innate immune system protect against infections (12 marks)

43. a) Discuss at least five factors that influence immunogenicity (10mks)

b) Outline five differences between killed vaccines and live attenuated vaccines (10mks)