



(University of Choice)

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

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR**

SECOND YEAR FIRST SEMESTER REGULAR EXAMINATIONS

**FOR THE DEGREES
OF
BACHELOR OF MEDICAL LABORATORY SCIENCES
AND
BACHELOR OF MEDICAL BIOTECHNOLOGY
(REGULAR)**

COURSE CODE: BML 328

COURSE TITLE: CLINICAL IMMUNOLOGY AND VACCINOLOGY

DATE: 8TH OCTOBER 2018

TIME: 2PM-4PM

INSTRUCTIONS TO CANDIDATES

This paper is divided into three sections, **A**, **B**, and **C** carrying respectively: Multiple Choice Questions (**MCQs**), Short-Answer Questions (**SAQs**), and Long-Answer Questions (**LAQs**).

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over.

BML 328: Clinical Immunology and Vaccinology

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Which of the following is an immunofluorescence technique?
 - a) Rapid diagnostic test
 - b) Flow cytometry
 - c) Radio-immunoassay
 - d) Complement fixation
2. Which globulin migrates furthest following electrophoresis of human serum?
 - a) Gamma-globulin
 - b) Beta-globulin
 - c) Alpha-globulin
 - d) Albumin
3. Which of the following cells causes tumour cell cytolysis without prior sensitization?
 - a) Platelets
 - b) Cytotoxic T lymphocytes
 - c) Natural Killer cells
 - d) Killer cells
4. Which of the following is required for the formation of immune complexes during precipitation reactions?
 - a) Magnesium ions
 - b) Multivalent antigens
 - c) Excess of antibody
 - d) Monoclonal antibodies
5. Which of the following is a type of immunoprecipitation?
 - a) Ouchterlony
 - b) Enzyme-linked immunosorbent assay
 - c) Gel electrophoresis
 - d) Complement fixation
6. Which of the following is a primary immunodeficiency affecting the thymus?
 - a) Hereditary ataxia-Telangiectasia
 - b) Di George syndrome
 - c) HIV/AIDS
 - d) Severe combined immunodeficiency
7. Which of the following describes the affinity of antigen-antibody binding?
 - a) The strength of binding between a single epitope and a paratope
 - b) The strength of multiple interactions between a multivalent antigen and antibody

- c) The strength of the interaction between two or more antigens sharing similar structural features
 - d) The reversible non-covalent binding between hydrophilic groups
8. Which of the following defines a precipitin?
- a) Antibodies that aggregate soluble antigens into visible precipitate
 - b) Antibodies that agglutinate particulate antigens into visible aggregates
 - c) An immunoglobulin
 - d) Antibodies that clump bacterial cells
9. Which of the following antibodies mediate complement fixation tests?
- a) IgM and IgG
 - b) IgE and IgM
 - c) IgG and IgD
 - d) IgM and IgD
10. Which of the following is the principle for rapid diagnostic tests?.
- a) Immunofluorescence
 - b) Immunochromatography
 - c) Immune-turbidometry
 - d) Chemiluminescence
11. Primary risks associated with vaccines include, vaccines
- a) Causing illness
 - b) Acting as a super antigen and over stimulating the immune system
 - c) Inducing memory lymphocyte production
 - d) Causing allergic reaction
12. Which of the following is NOT TRUE regarding immunofluorescent tests?
- a) Detecting specific antigen or antibody in a histologic specimen
 - b) Detecting bacterial organisms
 - c) Detecting antigen-antibody complexes
 - d) Detecting clumping
13. In most patients with chronic granulomatous disease, a failure of phagocytic respiratory burst results from:
- a) Defect in integrin molecules, LFA-1 or mac-1
 - b) Defect in NADPH oxidase gene
 - c) Lack of variable immunoglobulin heavy chain sequences
 - d) Defect in CD11 or CD18 peptides
14. Development of congenital thymic hypoplasia is due to?
- a) Malformation of third and fourth pharyngeal pouches during sixth to tenth week of gestation

- b) Failure to respond to B cell maturational signals
 - c) Deficiency of adenosine deaminase
 - d) Breakage of T cell receptor and immunoglobulin heavy chain genes loci in chromosome 14
15. Test for recall tuberculosis responses is known as:
- a) Mantoux
 - b) AFB test
 - c) PCR
 - d) BCG
16. Which of the following potentiates vaccine efficacy?
- a) Recombinant antigens
 - b) Haptens
 - c) Adjuvants
 - d) Polysaccharide antigens
17. Autoimmune diseases are due to:
- a) Negative selection in the thymus
 - b) Negative selection in the bone marrow
 - c) Clones of self-reactive T and B cells that escape central tolerance
 - d) Peripheral clonal deletion following anergy
18. Rheumatoid factor are:
- a) Autoimmune IgM against Fc portion of IgG antibodies
 - b) Autoimmune IgG to Fc portion of IgG antibodies
 - c) Autoimmune IgM to Fc portion of IgM antibodies
 - d) Autoimmune IgM against joint antigens
19. Which of the following is a monomorphic HLA-I molecule expressed by adult and foetal cells?
- a) HLA-A
 - b) HLA-C
 - c) HLA-G
 - d) HLA-B
20. Which of the following causes haemolytic anaemia?
- a) Passive transfer of maternal Rh antibody to the foetus
 - b) Production of cold agglutinins after certain viral infections
 - c) Production of cold antibody to certain drugs
 - d) Transfusion of autologous stored red cells

SECTION B: SHORT-ANSWER QUESTIONS (40 MARKS)

1. Outline the laboratory tests used for diagnosis of HIV-1 infections (8 marks).
2. **Match the immunodeficiency diseases in COLUMN A (1-6) with the clinical features in COLUMN B (a-f) (8 marks)**

COLUMN A		COLUMN B	
1.	Congenital C3 deficiency	a)	Patients have repeated, recurrent sinus, lung, GI infections
2.	Chronic Granulomatous Disease	b)	Recurrent bacterial infections
3.	Leukocyte Glucose-6-Phosphate Dehydrogenase Deficiency	c)	Severe Chronic Candidiasis of mucosa, skin and nails
4.	Infantile sex-linked agammaglobulinemia	d)	Inability to kill catalase positive organisms leading to recurrent pyogenic infection
5.	IgA deficiency	e)	Inability to ingest microorganisms leading to repeated severe infections with encapsulated bacteria
6.	Chronic mucocutaneous Candidiasis	f)	Similar to CGD/Slow bacterial killing, but complete

3. Summarize the mechanisms of each of the different types of hypersensitivity states (8 marks).
4. Classify by tabulating organ and non-organ specific autoimmune diseases (8 marks).
5. Name any 4 tumour markers and mention the tumours they are used for (8 marks).

SECTION C: LONG-ANSWER QUESTIONS (40 MARKS)

1. Describe the applications of precipitation and agglutination tests in human disease diagnosis (20 marks).
2. Discuss vaccination as a strategy for human infectious disease prevention (20 marks).