



(University of Choice)

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

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

SECOND YEAR SECOND SEMESTER MAIN EXAMINATIONS

**FOR THE DIPLOMA
IN
MEDICAL BIOTECHNOLOGY
COURSE CODE: BBD 226**

COURSE TITLE: CLINICAL IMMUNOLOGY

DATE: 25TH APRIL 2023 TIME: 08.00 – 10.00AM

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 4 Printed Pages. Please Turn Over.

SECTION A Multiple Choice Questions (20 Marks)

- Q1. Serology is the study of _____?
- Serology is the study of blood serum and other bodily fluids for the identification of antibodies.
 - Serology is the study of blood serum and other bodily fluids for the identification of diseases.
 - Serology is the study of blood serum and other bodily fluids for the identification of antigens.
 - Serology is the study of blood serum and other bodily fluids for the identification of autoantibodies.
- Q2. The following is not true about people with Rh-positive blood.
- Are People with blood that have Rh antigens on the surface of their red blood cells. P
 - People with Rh-positive blood can receive blood that is Rh-positive
 - People with Rh-positive can receive Rh-negative blood.
 - People with Rh-positive cannot receive Rh-negative blood
- Q3. What are Radioimmunoassays?
- Are analyses that are based on the measurement of radioactivity associated with radioactives elements.
 - Are analyses that are based on the measurement of radioactivity associated with immune complexes.
 - Are analyses that are based on the measurement of radioactivity associated with compliment fixation proteins
 - Are analyses that are based on the measurement of radioactivity associated with autoimmune diseases.
- Q4. What is the definition of affinity?
- It is the rate at which the body fights a pathogen
 - Affinity is the equilibrium constant that describes the antigen-antibody reaction.
 - It is the equilibrium constant where immune system produce antibodies
 - It is the equilibrium constant where immune system produce antigens
- Q5. The following statement is true about Cross reactivity.
- Refers to the ability of an individual antigen combining site to react with more than one antibody determinant
 - Refers to an antigen reacting with another antigen
 - It is where an antibody reacts with another antibody
 - Refers to the ability of an individual antibody combining site to react with more than one antigenic determinant.
- Q6. The following is the effect of zeta potential.
- Prevents the agglutination of sensitized red cells in saline
 - Prevents the agglutination of sensitized white blood cells in saline.
 - Prevents the precipitation of sensitized red cells in saline
 - Prevents the precipitation of sensitized white blood cells in saline
- Q7. Lack of agglutination at high concentrations of antibodies due to?
- prozone effect.
 - Antibody-antigen incompatibility
 - Antigen-antibody precipitation
 - Antigen-antibody equilibrium

Q8. The following is the definition of precipitation reaction.

- a. Soluble antigens combine with insoluble antibodies in presence of an electrolyte at suitable temperature and pH to form insoluble visible complex.
- b. Soluble antigens combine with soluble antibodies in presence of an electrolyte at suitable temperature and pH to form soluble visible complex
- c. Insoluble antigens combine with soluble antibodies in presence of an electrolyte at suitable temperature and pH to form insoluble visible complex
- d. Soluble antigens combine with soluble antibodies in presence of an electrolyte at suitable temperature and pH to form insoluble visible complex

Q9. Enzyme-linked immunosorbent assay is an immunological assay commonly used to?

- a. Measure specifically antigens, in biological samples.
- b. Measure specifically antibodies in biological samples.
- c. Test for viruses in biological samples.
- d. Measure antibodies, antigens, proteins and glycoproteins in biological samples.

Q10. The following statement is true about Immuno-electrophoresis.

- a. Complex mixture of antigens in an agar gel are separated according to their charge.
- b. complex mixture of antigens in a culture media are separated according to their charge
- c. complex mixture of antigens in a saline solution are separated according to their charge
- d. complex mixture of antigens an agar gel are separated according to their weight.

Q11. Which of the following is true.

- a. A blood group "AB Rh+ve" person has antibodies "a" and "b" in serum
- b. A blood group "AB Rh+ve" person has no antibodies "a" and "b" in serum
- c. A blood group "AB Rh+ve" person has only antibody "a" in serum
- d. A blood group "AB Rh+ve" person has only antibody "b" in serum

Q12. Immunologically, which statement is true about haemolysis?

- a. It is the antigen-antibody reactions that result in lysis,
- b. It is the exposure of blood to oxygen that causes hemolysis
- c. It is the auto reaction of red cells and platelets resulting into hemolysis
- d. The auto reaction of antibodies resulting into hemolysis

Q13. What is avidity?

- a. Avidity is the binding of a multimeric antibody to one antigen.
- b. Avidity is the binding of one antibody to one antigen.
- c. Avidity is the binding of a multimeric antibody to multiple antigens.
- d. None of the above.

Q14. The following is definition of antibody.

- a. It is a pathogen that causes the body to make a specific immune response
- b. It is a protein made by plasma cells in response to specific antigen
- c. It is a substance that causes the body to make a general immune response to microbes.
- d. It is a substance that causes the body to make a specific immune response

Q15. The following is not a cause of incompatible crossmatch.

- a. Patient or donor unit factors
- b. technical error during blood grouping stage
- c. Clerical error
- d. Autoimmune disease in donor cells.

Q16. Which of the following statement is true about antigen-antibody reaction.

- a. The reaction only takes in vitro
- b. The reaction only takes in vivo
- c. The only takes place when a pathogen triggers the reaction
- d. The antibody-antigen reacts specifically.

Q17. Individuals with Blood group AB...

- a. Can donate blood to other AB individuals, but can receive blood of any type.
- b. Cannot donate blood to other AB individuals, but can receive blood of any type.
- c. Can donate to give other only to other AB individuals, but can receive blood of AB type only.
- d. Can be universal donor to any individual.

Q18. An adjuvant is _____?

- a. A substance that non-specifically enhances the immune response to an antigen
- b. A substance that causes an immune response to a pathogen.
- c. A substance that reacts with an antibody.
- d. A substance that reacts with an antigen.

Q19. Which of the following factor cannot affect antigen-antibody reaction?

- a. Zeta potential
- b. PH
- c. Temperature
- d. Presence of other antigens other than the target antigen.

Q20. In second stage of antigen-antibody reaction, the following happens.

- a. There be demonstrable effect of attachment of antibody to antigen.
- b. There will be dissociation of antigen and antibody.
- c. There will be invisible antibody-antigen effect.
- d. The antigen and antibody will be bumping into each other in readiness for a reaction.

SECTION B: 40MKS

- Q1. Describe any 5 immune related disorders (10mks)
- Q2. Explain the procedure of **radial** Immunodiffusion (10mks)
- Q3. Highlight factors that will determine tissue and organ transplant to a patient (10mks)
- Q4. An individual who is Blood group O Rh-positive is a universal donor. Explain (10mks)

SECTION C: 60MKS

- Q1. Explain any five factors that influence antigen-antibody reactions (20mks)
- Q2. Explain the methods of suppression of the immune system (20mks)
- Q3. Explain any five factors that can cause cross-match incompatibility (20mks)