



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)
MAIN CAMPUS
UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

SECOND YEAR SEMESTER EXAMINATIONS

**FOR THE DIPLOMA
OF
MEDICAL BIOTECHNOLOGY**

COURSE CODE: BBD 226

**COURSE TITLE: CLINICAL IMMUNOLOGY
MAIN EXAM**

DATE: 21/04/2022

TIME: 12.00 -2.00PM

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**). **Answer all questions. DO NOT WRITE ON THE QUESTION PAPER.**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

SECTION A (MCQ 20 MARKS)

- Q1. The following is definition of antibody.
- It is a pathogen that causes the body to make a specific immune response
 - It is a protein made by plasma cells in response to specific antigen
 - It is a substance that causes the body to make a general immune response to microbes.
 - It is a substance that causes the body to make a specific immune response
- 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 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
- Q4. 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.
- Q5. 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
- Q6. 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.
- 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.
- 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. Serology is the study of _____ ?
- a. Serology is the study of blood serum and other bodily fluids for the identification of antibodies.
 - b. Serology is the study of blood serum and other bodily fluids for the identification of diseases.
 - c. Serology is the study of blood serum and other bodily fluids for the identification of antigens.
 - d. Serology is the study of blood serum and other bodily fluids for the identification of autoantibodies.
- 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...
- Can donate blood to other AB individuals, but can receive blood of any type.
 - Cannot donate blood to other AB individuals, but can receive blood of any type.
 - Can donate to give other only to other AB individuals, but can receive blood of AB type only.
 - Can be universal donor to any individual.
- Q18. An adjuvant is _____?
- A substance that non-specifically enhances the immune response to an antigen
 - A substance that causes an immune response to a pathogen.
 - A substance that reacts with an antibody.
 - A substance that reacts with an antigen.
- Q19. Which of the following factor cannot affect antigen-antibody reaction
- Zeta potential
 - PH
 - Temperature
 - Presence of other antigens other than the target antigen.
- Q20. In second stage of antigen-antibody reaction, the following happens.
- There be demonstrable effect of attachment of antibody to antigen.
 - There will be dissociation of antigen and antibody.
 - There will be invisible antibody-antigen effect.
 - The antigen and antibody will be bumping into each other in redness for a reaction.

SECTION B: 40MKS

- Q1. An individual who is Blood group O Rh-positive is a universal donor. Explain (10mks)
- Q2. Explain the procedure of **radial Immunodiffusion** (10mks)
- Q3. Highlight factors that will determine tissue and organ transplant to a patient (10mks)
- Q4. Corona Virus has been more severe in people with other underlying conditions and in people above 60 years than in healthy population. Explain. (10mks).

SECTION C: 60MKS

- Q1. Explain any five factors that influence antigen-antibody reactions (20mks)
- Q2. State the principle and procedure of Immuno Enzyme-Linked Immunosorbent Assay, list any two viruses that can be identified by this method (20mks)
- Q3. Explain any five factors that can cause cross-match incompatibility (20mks)