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AFRICA
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**COLLEGE OF HEALTH, AGRICULTURE AND NATURAL
SCIENCES
DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES
BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE**

NSLS 200: BLOOD TRANSFUSION AND IMMUNOLOGY

END OF SEMESTER EXAMINATION

NOVEMEBR, 2025

LECTURER: DR A MARAMBA

DURATION: 3 HOURS

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SECTION A : MULTIPLE CHOICE [50MARKS]

- Answer all questions by encircling the correct response T for TRUE or F for FALSE for each statement in all the questions
- Each correct response is allocated half mark

1. The antihuman globulin (AHG) test is used for:

- T F a) haemolytic transfusion reaction (HTR) investigation
T F b) blocking the primary antibody
T F c) HDNF investigation
T F d) blood grouping
T F e) investigation of drug-induced haemolysis

2. The following are components of the immune system

- T F a) Plasma cells
T F b) Mucosa Associated Lymphoid Tissue (MALT)
T F c) CD4 T lymphocytes
T F d) Trophoblasts
T F e) Eosinophils

3. Mucus-secreting membranes are found in the

- T F a) urinary system
T F b) digestive cavity
T F c) respiratory passages
T F d) nervous system
T F e) coagulation system

4. Which of the following are used for elution?

- T F a) Xylene
T F b) Ficin
T F c) Ether
T F d) Ethanol
T F e) Chloroform

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5. Direct antiglobulin test (DAT):

- T F (a) detects antibodies bound to red cells *in vivo*
 T F (b) results from clinical event or illness
 T F (c) detects antibodies bound *in-vitro*
 T F (d) EDTA anticoagulated sample cannot be used
 T F (e) plasma is the sample of choice

6. Concerning the P blood group system

- T F a) all antigens are expressed on glycolipids on RBCs
 T F b) there is naturally occurring anti-P
 T F c) action of anti-P is enhanced by the use of enzymes
 T F d) P1 has the reactivity as hydatid cyst fluid
 T F e) anti-Tja is a combination antibody in p-individuals

7. The following antigens are fully developed at birth

- T F a) D
 T F b) I
 T F c) Lewis
 T F d) ABH
 T F e) P1

8. Immature T cells that have a TCR (T cell receptor) which recognize self-antigens are eliminated in the thymus through the following process:

- T F a) cytotoxic T cell killing
 T F b) negative selection
 T F c) positive selection
 T F d) apoptosis
 T F e) somatic hyper-mutation

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- T F a) more mature macrophage populations
- T F b) antibodies with a capacity to bind more tightly to the foreign antigen
- T F c) slower immune complex formation
- T F d) rapid immunoglobulin gene rearrangements
- T F e) increased antibody valence

10. Lymphatic vessels are found throughout the body except

- T F a) Skin
- T F b) Avascular tissue
- T F c) Central nervous system
- T F d) Splenic pulp
- T F e) Bone marrow

11. The process of isotype switching

- T F a) results in B cells that express antibodies of different classes, but which have the same antigen specificity.
- T F b) results in increased avidity.
- T F c) comes from the use of different heavy chain proteins.
- T F c) comes from the use of different light chain proteins.
- T F e) has no effect on immune function.

12. Enzyme action enhances reaction with:

- T F a) anti-C
- T F b) anti-K
- T F c) anti-S
- T F d) anti-M
- T F e) anti-E

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13. The following form part of the fluidics in flow cytometry

- T F a) light source
- T F b) optical channels
- T F c) sheath fluid
- T F d) photo multiplier tube
- T F e) Flow chambers

14. The following constitute positive reactions in blood transfusion:

- T F a) inhibition
- T F b) haemolysis
- T F c) inflammation
- T F d) agglutination
- T F e) elution

15. The following factors affect the antigen/ antibody reactions

- T F a) pH
- T F b) number of antigenic sites
- T F c) storage time
- T F d) antigen class
- T F e) antigen/ antibody affinity

16. What pre-transfusion laboratory procedures are recommended?

- T F a) Checking the record of previous group and Ab screening results
- T F b) Performing ABO and Rhesus D grouping
- T F c) Performing an antibody detection (screening) test
- T F d) checking for CD38 expression
- T F e) Selection of blood and cross-matching the patient's serum/plasma against the donor's red cells, or using an 'electronic issue' system.

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17. The following statements about agglutination are True or False

- | | | | |
|---|---|----|--|
| T | F | a) | is combination of an insoluble particulate antigen with its soluble antibody |
| T | F | b) | provides a way to serotype bacteria |
| T | F | c) | can be used to test for pregnancy |
| T | F | d) | is sensitive for detection of antibody |
| T | F | e) | takes a long a time to give results |

18. Separation of the different proteins can be done on the basis of

- | | | | |
|---|---|----|-------------------|
| T | F | a) | density, |
| T | F | b) | size and charge |
| T | F | c) | antigenicity |
| T | F | d) | solubility |
| T | F | e) | antibody affinity |

19. The ABO blood group system:

- | | | | |
|---|---|----|---|
| T | F | a) | antigens are mostly glycoproteins |
| T | F | b) | A ₂ antigen is a weak subgroup |
| T | F | c) | an O blood group has anti- A and anti-B |
| T | F | d) | the blood group was discovered by Landsteiner |
| T | F | e) | the gene that controls it is on chromosome 9 |

20. The following antigens show dosage in their reactivity

- | | | | |
|---|---|----|------|
| T | F | a) | Rh D |
| T | F | b) | S |
| T | F | c) | P |
| T | F | d) | JKa |
| T | F | e) | FYa |

SECTION B: [20 MARKS]

I. Answer all questions on separate answer sheets provided.

Each question carries 5 Marks

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1. State the difference between an 'allo-antibody' and an 'auto-antibody'. [5marks]
2. Why is homozygosity of antigenic expression, for certain antigens, important for antibody screening cells? [5 marks]
3. List any 5 -major blood group'. [5 marks]
4. Why is anti-k such a rare antibody while anti-K is such a common antibody? [5 marks]

SECTION C: ESSAY QUESTIONS [50 Marks]**Instructions**

- i) **Answer 3 questions out of 5 in this section.**
- ii) **Each question carries 25 marks.**
 1. Describe the Fisher, Wiener and Rosenfield nomenclature systems of the Rhesus blood group system.
 2. Explain how a suspected immediate haemolytic transfusion reaction is investigated
 3. Write short notes on the following
 - a. B cell development [12.5 Marks]
 - b. T cell development [12.5 Marks]
 4. Describe the events in chronic inflammation
 5. Discuss the causes of ABO blood group discrepancies and how they can be resolved