CANDIDATE NUMBER.....

AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS

NSLS 200: BLOOD TRANSFUSION AND IMMUNOLOGY

NOVEMBER 2023

LECTURER: DR A. MARAMBA

DURATION: 3 HOURS

INSTRUCTIONS

1. Write your candidate number on the space provided on top of each page
2. Answer **all** questions in sections A on the question paper.
3. Answer **all** questions in section B on separate answer sheets provided.
4. Answer any **3** questions in section C on separate answer sheets provided
5. Mark allocation for each question is indicated at the end of the question
6. Credit will be given for logical, systematic and neat presentations in sections B and C

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SECTION A : MULTIPLE CHOICE [40 MARKS]

- **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 following constitute positive reactions in blood bank:

T F a) rouleaux formation

T F b) haemolysis

T F c) inflammation

T F d) agglutination

T F e) elution

2. Technical errors associated with positive ABO results are:

T F a) over centrifugation

T F b) failure to add active reagents

T F c) use of dirty glassware

T F d) incorrect interpretation of results

T F e) failure to identify haemolysis

3. The antihuman globulin (AHG) test is used for/ in:

T F a) haemolytic transfusion reaction (HTR) investigation

T F b) Rh D testing

T F c) HDNF investigation

T F d) red cell phenotyping

T F e) investigation of drug-induced haemolysis

4. The following are reasons for antibody screening:

T F a) to complete serological cross-matching

T F b) to allow early detection of allo-antibodies

T F c) to detect in vivo sensitization

T F d) to detect auto-antibodies

T F e) to enable electronic issue only

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5. 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)	Spleen
T	F	e)	Bone marrow

6. The following are primary lymphoid organs

T	F	a)	thymus
T	F	b)	mammary glands
T	F	c)	tonsils
T	F	d)	spleen
T	F	e)	bone marrow

7. The following are leukocytes

T	F	a)	CD4+ monocytes
T	F	b)	erythrocyte
T	F	c)	monocyte
T	F	d)	parenchymal cells
T	F	e)	fibroblast

8. Match the following pairs.

I	R1	a)	dcE
II	R2	b)	dCe
III	R0	c)	DcE
IV	r’	d)	DCe
V	r’’	e)	Dce

I……II……. III…….. IV……..V……

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9. The following lymphocyte is involved in nonspecific immune defense

T F a) T-cells

T F b) B-cells

T F c) Natural Killer (NK) cells

T F d) mast cells

T F e) none of the above

10. Which of the following antigens come from the lactoceramide structure**?**

T F a) A

T F b) Le^b

T F c) D

T F d) c

T F e) P

11. Concerning the Ii blood group system:

T F a) I is a high frequency antigen

T F b) adult cells have a lot of I antigen during disease state

T F c) i increases with age

T F d) anti-I reacts best at 4^0C

T F e) anti-i is never immune type

12. Concerning the *hh* genotype:

T F a) the back type is discrepant

T F b) there is anti-I in the serum

T F c) there is an apparent O front type

T F d) there is anti-AB in the serum

T F e) it is also known as parabombay

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13. Which blood group system is known for showing dosage effect?

T F a) Lewis

T F b) P1

T F c) Kidd

T F d) RhD

T F e) Duffy

14. The reduction of the distance between adjacent cells is achieved by:

T F a) destroying certain antigens

T F b) low zeta potential

T F c) exposing the antigens to carbon dioxide

T F d) neutralization of cations by polybrene and protamine

T F e) reduction of the concentration of ions by LISS

15. Enzyme action enhances reaction with:

T F (a) anti-C

T F (b) anti-s

T F (c) anti-E

T F (d) anti-M

T F (e) anti-S

16. Which of the following statements is not true?

T F (a) The humoral system is mainly concerned with defending the extracellular spaces

T F (b) The cell mediated response is not concerned with dealing with intracellular pathogens.

T F (c) MHC class II plays an important role in the innate response system

T F (d) Adaptive response mechanisms are more specific than innate responses

T F (e) All of the above statements are true

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17. The movement of neutrophils under the influence of an external chemical signal is called

T F (a) Endocytosis

T F (b) Chemotaxis

T F (c) Phagocytosis

T F (d) Chemolysis

T F (e) Opsonization

18. The following antibodies can be naturally occurring:

T F a) Anti-P1

T F b) Anti-Lu^a

T F c) Anti-Fy^b

T F d) Anti-Jk^a

T F e) Anti-AB

19. **The spleen is largely involved with the response to antigens which are in the:**

T F (a) Tissues

T F (b) Blood

T F (c) Gut

T F (d) Lungs

T F (e) Urogenital tract

20. **Concerning cytokines:**

T F (a) Interferons were the first cytokines to be discovered

T F (b) Interferons are produced by any T or NK cells

T F (c) TNF cytokines can signal death of certain cells

T F (d) Cytokine antagonists can not bind to cytokines

T F (e) CMV and EBV viruses can mimic cytokines and cytokine receptors

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SECTION B: [20 MARKS]

I. **Answer all questions on separate answer sheets provided.**

II. **Each question carries 5 Marks.**

1. List 5 attributes of cytokines
2. Why is homozygosity of antigenic expression, for certain antigens, important for antibody screening cells?
3. Antibody ID Puzzle Questions: Patient I

Cell	D	C	E	c	e	P1	M	N	S	s	Le^a	Le^b	Lu^a	Lu^b	K	k	Fy^a	Fy^b	Jk^a	Jk^b	LISS 37°C	Enzy 37° C
1	-	-	-	+	+	4	+	-	+	-	+	-	-	+	+	+	-	+	+	+	+	+
2	-	-	-	+	+	3	+	+	-	+	-	-	-	+	+	+	+	+	+	-	+	+
3	-	-	-	+	+	1	+	-	-	+	-	+	-	+	-	+	+	-	-	+	+	+
4	-	+	-	+	+	1	-	+	-	+	-	+	-	+	-	+	+	-	+	+	-	+
5	-	-	+	+	+	4	-	+	-	+	-	+	-	+	-	+	-	+	+	-	+	+
6	+	+	-	-	-	4	-	+	-	+	+	-	-	+	+	-	+	-	-	+	-	-
7	+	+	-	-	-	2	+	-	+	-	-	+	+	-	-	+	-	+	-	+	-	-
8	+	-	+	+	+	3	+	+	+	-	-	+	-	+	-	+	-	+	+	+	+	+
9	+	-	+	+	+	2	-	+	-	+	-	-	-	+	-	+	+	-	+	+	+	+
10	+	+	-	-	+	-	-	+	-	+	-	+	-	+	-	+	+	-	+	-	-	-

Possible antibody(ies) identified ……

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4. Antibody ID Puzzle Questions: Patient II

Cell	D	C	E	c	e	P1	M	N	S	s	Le^a	Le^b	Lu^a	Lu^b	K	k	Fy^a	Fy^b	Jk^a	Jk^b	LISS 37°C	Enzy 37°C
1	-	-	-	+	+	4	+	-	+	-	+	-	-	+	+	+	-	+	+	+	+	-
2	-	-	-	+	+	3	+	+	-	+	-	-	-	+	+	+	+	+	+	-	+	+
3	-	-	-	+	+	1	+	-	-	+	-	+	-	+	-	+	+	-	-	+	-	-
4	-	+	-	+	+	1	-	+	-	+	-	+	-	+	-	+	+	-	+	+	-	-
5	-	-	+	+	+	4	-	+	-	+	-	+	-	+	-	+	-	+	+	-	+	+
6	+	+	-	-	-	4	-	+	-	+	+	-	-	+	+	-	+	-	-	+	-	-
7	+	+	-	-	-	2	+	-	+	-	-	+	+	-	-	+	-	+	-	+	+	-
8	+	-	+	+	+	3	+	+	+	-	-	+	-	+	-	+	-	+	+	+	+	-
9	+	-	+	+	-	2	-	+	-	+	-	-	-	+	-	+	+	-	+	+	-	-
10	+	+	-	-	-	-	-	+	-	+	-	+	-	+	-	+	+	-	+	-	+	+
Possible antibody(ies) identified……..																						

SECTION C: ESSAY QUESTIONS [40 Marks]

Instructions

- **Answer 2 questions out of 5 in this section.**
- **Each question carries 20 marks.**

1. Describe the following antibodies reactivity and significance:
   a) Anti-D
   b) Anti-K
   c) Anti-Fy^a
   d) Anti-Jk^a
2. Describe the unique characteristics of the Lewis blood group system
3. Describe the role of the laboratory in pretransfusion
4. With the aid of diagrams describe the development of T lymphocytes.
5. Describe the events in acute inflammation