



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH AND APPLIED SCIENCES**

**DEPARTMENT OF HEALTH SCIENCES**

<b>QUALIFICATION : BACHELOR OF MEDICAL LABORATORY SCIENCES</b>	
<b>QUALIFICATION CODE: 08BMLS</b>	<b>LEVEL: 6</b>
<b>COURSE CODE: IMH612S</b>	<b>COURSE NAME: IMMUNOHAEMATOLOGY</b>
<b>SESSION: JANUARY 2020</b>	<b>PAPER: THEORY</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS:100</b>

<b>SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION PAPER</b>	
<b>EXAMINER(S)</b>	<b>EDWIG HAUWANGA</b>
<b>MODERATOR:</b>	<b>MR MAURICE NYAMBUYA</b>

<b>INSTRUCTIONS</b>	
<ol style="list-style-type: none"><li>1. Answer ALL the questions.</li><li>2. Write clearly and neatly.</li><li>3. Number the answers clearly.</li></ol>	

**THIS QUESTION PAPER CONSISTS OF 6 PAGES** (including this front page)

**SECTION A (31 MARKS)**

[15]

**QUESTION 1**

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Write the appropriate letter next to the number of the statement/phrase.

1.1 Blood group antigens on the red cells occur as the following molecules except: (1)

- (A) Lipid
- (B) Proteins
- (C) Glycoproteins
- (D) Glycolipids

1.2 The process of identifying red cell antigens by agglutinating them with anti-sera is known as.. (1)

- (A) Antibody screening
- (B) Antibody identification
- (C) Phenotyping
- (D) ABO Typing

1.3 Which of the following best describes the expression of blood group inheritance? (1)

- (A) Dominant
- (B) Recessive
- (C) Codominant
- (D) Recessive

1.4 Identify the immunodominant sugar for the H antigen. (1)

- (A) D galactose
- (B) L-fructose
- (C) L-Fructosyltransferase
- (D) N-acetylgalactoseamine

1.5 The enzyme D-galactosamine transfers a sugar for which antigen: (1)

- (A) A antigen
- (B) B antigen
- (C) O antigen
- (D) H antigen

1.6 ABO discrepancy characterized by a population of agglutinated cells and another of agglutinated cells is known as... (1)

- (A) Weak subtypes
- (B) Mixed Field
- (C) Weak subtypes
- (D) Immunocompromised patient

1.7 Using the following ABO typing results, what conclusion can be drawn from these results? (1)

Forward Typing		Reverse Typing	
Anti-A	Anti-B	A1cells	B cells
4+	4+	1+	0

- (A) Expected results for O
- (B) Expected results for AB
- (C) Discrepant results, of weak A
- (D) Discrepant results of B

1.8 A father who is R1r and a mother that is R2r can produce the following off springs except: (1)

- (A) DcE/DcE
- (B) DcE/ce
- (C) DCe/Dce
- (D) ce/ce

1.9 D antigens are weakened when inherited in trans with a.....? (1)

- (A) d
- (B) e
- (C) D
- (D) c

1.10 A 23-year-old female patient tested A negative. She has never had children and her transfusion history is unknown. Which unites would you issue considering a low blood bank stock? (1)

- (A) A negative
- (B) A positive
- (C) O positive
- (D) O negative

1.11 Identify most frequent Kell phenotype? (1)

- (A) K+k-
- (B) K+k+
- (C) K-k+

(D) Kp (a+b-)

1.12 The duffy phenotype Fy (a-b-) is resistant to which malaria parasite? (1)

- (A) *P. Falcipurum*
- (B) *P. Vivax*
- (C) *P. Ovale*
- (D) *P. Malariae*

1.13 Identify the antigens that are destroyed by enzymes (1)

- (A) Le
- (B) E
- (C) Fy<sup>a</sup>
- (D) s

1.14 Identify the anticoagulant used in samples for DAT (1)

- (A) Citrate
- (B) EDTA
- (C) Gel separator
- (D) No anticoagulant, use a dry tube

1.15 The following are all uses of DAT except. (1)

- (A) Identification of antibodies
- (B) Investigations of haemolytic anaemias
- (C) Investigations of Haemolytic Disease of the New-born
- (D) Investigations of transfusion reactions

**QUESTION 2** [12]

2.1 For the following Blood Group systems, suggest main antigens, antibody class and clinical significance. (12)

Blood Groups	Main Antigen	Ab Class	Clinical significance
Kell			
Kidd			
Lutheran			
MNS			

**QUESTION 3****[4]**

3.1 The I blood group system is made up of I antigens found on adult cells and i antigens found on infant cells. Briefly describe the transition of i antigens to I antigens from infants to adults.

**SECTION B (30 MARKS)****QUESTION 4****[20]**

4.1 Briefly describe the following antibody antigen reactions:

4.1.1 Hemagglutination (2)

4.1.2 Sensitization (2)

4.1.3 Haemolysis (2)

4.1.4 Neutralization (agglutination inhibition) (2)

4.1.5 Precipitation (2)

4.2 Identify FIVE reasons for temporary deferral and FIVE reasons for permanent deferral in donors. (10)

**QUESTION 5****[10]**

5.1 For each of the following scenarios, suggest the most suitable blood product and the reason for choice of product.

5.1.1 An anaemic patient with IgA deficiency syndrome. (2)

5.1.2 A Haemophilic A patient. (2)

5.1.3 A leukaemia patient on chemotherapy with normal red cell and white cell count and low platelets. (2)

5.1.4. A severely burned man that survived a recent fire. (2)

5.1.5 Motor vehicle accident known patient with a low platelet count currently being treated for Idiopathic thrombotic purpura. (2)

**SECTION C (39 MARKS)**

**QUESTION 6**

[20]

6.1 Describe the pathogenesis of the Haemolytic disease of the foetus and New-born. (10)

6.2 A Rh-negative mother gives birth to a baby with haemolytic disease of the new-born. You are required carry out the acid elution test to suggest a dose of RhIg for the mother. Explain how this will be carried out. (10)

**QUESTION 7**

[19]

7.0 A young man who is O negative came in with a gunshot wound and bleeding profusely. His antibody screens tested positive at IAT and the following antibody panel was set up.

Antibody Identification Panel 2 (Ficin-Treated)\*:

	RH						MNS				LU		P	Lewis		Kell		Duffy		Kidd		Ficin		
	D	C	E	c	e	f	M	N	S	s	Lu <sup>a</sup>	Lu <sup>b</sup>	P <sub>1</sub>	Le <sup>a</sup>	Le <sup>b</sup>	K	k	Fy <sup>a</sup>	Fy <sup>b</sup>	JK <sup>a</sup>	JK <sup>b</sup>	37 C	IAT	
1	+	+	0	0	+	0	+	+	+	+	0	+	+	0	+	0	+	0	+	+	+	+	2+	4+
2	+	+	0	0	+	0	+	+	+	0	0	+	0	0	0	0	+	+	+	+	+	+	2+	4+
3	+	0	+	+	0	0	0	+	+	+	0	+	0	0	0	0	+	+	+	0	+	0	0	0√
4	+	0	0	+	+	+	+	+	0	+	0	+	+	+	0	0	+	0	0	0	+	0	0	0√
5	0	+	0	+	+	+	+	+	0	+	0	+	+	+	0	0	+	+	0	+	0	2+	4+	
6	0	0	+	+	+	+	+	+	+	0	+	+	0	+	0	+	0	+	+	+	+	0	0	0√
7	0	0	0	+	+	+	+	+	0	+	0	+	+	+	0	+	+	0	+	0	+	0	0	0√
8	0	0	0	+	+	+	+	+	+	0	+	+	0	0	+	0	+	+	0	+	0	+	0	0√
9	0	0	0	+	+	+	+	0	+	0	+	+	+	0	0	+	0	+	+	+	+	0	0	0√
10	0	0	0	+	+	+	0	+	0	+	0	+	+	0	+	0	+	+	0	0	+	0	0	0√
11	+	+	0	0	+	0	+	+	+	+	0	+	0	+	0	+	+	0	+	+	+	+	2+	4+
AC																						0	0√	

\*Initial panel – ficin treated by manufacturer

7.1 Identify the antibody. (2)

7.2 Explain the steps you took to identify the antibody. (8)

7.3 The blood bank stock is currently running low, especially on O negative units? Explain how you would go about issuing compatible units for this patient. (3)

7.4 Explain the principle of DAT and identify at least two of its uses. (6)

**End of paper!**