



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	LEVEL: 6
COURSE CODE: IMH621S	COURSE NAME: IMMUNOHAEMATOLOGY
SESSION: NOVEMBER 2022	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION PAPER	
EXAMINER(S)	Ms EDWIG HAUWANGA
MODERATOR:	Dr MAURICE NYAMBUYA

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

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

SECTION A (44 MARKS)

QUESTION 1

[10]

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 A gene that produces no detectable product is referred to as. (1)

- (A) A regulator gene
- (B) An allele
- (C) An Amorph
- (D) A null gene

1.2 Which ABO discrepancy best explains the following results? (1)

Forward Typing		Reverse Grouping	
Anti-A	Anti-B	A1 Cells	B cells
4	0	0	0

- (A) Subgroup of A
- (B) Mixed field reactions
- (C) Immunocompromised patient
- (D) These results are correct

1.3 What are the gene products of the A and B genes? (1)

- (A) Transferase Enzymes
- (B) Glycoproteins
- (C) Oligosaccharides
- (D) Glycolipid

1.4 The Rh null phenotype is associated with? (1)

- (A) Elevated D antigen expression
- (B) Weak D expression
- (C) The Bombay phenotype
- (D) Red blood cell membrane abnormalities

1.5 Which phenotype is associated with resistance to malaria? (1)

- (A) Fy(a-b-)
- (B) Fy (+b+)
- (C) Jk (a-b-)
- (D) Le (a+b+)

- 1.6 Identify the best product used to treat Idiopathic Thrombocytopenic Purpura? (1)
- (A) Plasma
 - (B) Platelet
 - (C) Cryoprecipitate
 - (D) Whole blood
- 1.7 Which of the following haematological disorders can be treated by therapeutic blood bleeding? (1)
- (A) Anaemia
 - (B) Hodgkin's Lymphoma
 - (C) Essential Thrombocythemia
 - (D) Polycythaemia Vera
- 1.8 The component in additive solution that prevents cell lysis during storage is..... (1)
- (A) Adenine
 - (B) Citric acid
 - (C) Saline
 - (D) Mannitol
- 1.9 Which of the following patient information is crucial and never compromised in identifying a patient for pre-transfusion testing? (1)
- (A) Dr's Signature
 - (B) ID number
 - (C) Hospital number
 - (D) Diagnosis
- 1.10 Other than Rh, what other unexpected antibody is implicated in causing Haemolytic disease of the new-born? (1)
- (A) Anti-K
 - (B) Anti-JK^a
 - (C) Anti-Le^a
 - (D) Anti-M

QUESTION 2**[21]**

- 2.1 Briefly explain the Landsteiner's law. (2)
- 2.2 Explain the solubility of ABH substances. (5)
- 2.3 Propose probable genotypes for each of the following ABO phenotypes: (6)

Phenotype	Genotype
A	
B	
AB	
O	

2.4 Identify the nomenclature system used in the following Rh phenotypes: (4)

- a) Rh1
- b) DcE
- c) r''
- d) 004001

2.5 Explain two reasons for the expression of weak D antigens on red cells. (4)

QUESTION 3 [13]

3.1 Briefly describe the term blood group system. (2)

3.2 You are in the reference laboratory trying to identify antibody specificities of a multi antibody panel. You are suspecting three antibody specificities, namely anti-K, anti-E and anti-Lea. Explain how you can manipulate the properties of the antibodies/antigens involved to get to each antibody specificity. (6)

3.3 Briefly outline 5 characteristics of the Duffy antigen. (5)

SECTION B (32 MARKS)

QUESTION 4 [14]

4.1 Briefly outline the physical criteria used in selecting donors. (6)

4.2 ACD and CPD are anticoagulant/preservatives used in whole blood collection. What do the abbreviations stand for and how has CPD been an improvement from ACD. (6)

4.3 Suggest modified red cell blood products that can be vital in preventing the following transfusion reactions: (4)

- a) Graft vs Host Disease
- b) Immune Mediated Non Haemolytic Anaemia
- c) Allergic Reactions
- d) Anaphylactic

QUESTION 5

[18]

- 5.1 Weak A and Weak D typing results can be very problematic in donor testing. Explain the implications of unresolved anomalous weak A and weak D results on donor units. (4)
- 5.2 Identify serological markers used in testing for the following Transfusion Transmissible Infections (TTIs): (5)
 - a) Hepatitis B
 - b) Hepatitis C
 - c) HIV
- 5.3 Apart from serological testing, Nucleic Acid Testing is also used to test for TTIs. What are the advantages of using nucleic acid testing in TTI testing. (3)
- 5.4 Outline the guidelines in crossmatching and issuing blood for infants. (6)

SECTION C (MARKS 24)

QUESTION 6

[12]

The following are crossmatch results of a patient of an O positive patient against O positive donors (Red cell concentrate) and the patient’s antibody screen results.

	Anti-A	Anti-B	Anti-AB	Anti-D	A1cells	B cells	IS XM	IAT XM
Patient	0	0	0	4	4	4	0	0
Donor1	1	0	1	4	3	4	2	0
Donor 2	0	0	0	4	4	4	0	0
Donor 3	0	0	0	4	4	4	0	0

	IS	IAT	Sensitized Cells
Screen 1	0	0	2
Screen 2	0	0	2

- 6.1 Interpret the results: (4)
- 6.2 Are all the units compatible? Explain your answer and state further actions. (8)

QUESTION 7

[12]

7.1 Identify and explain the five basic pillars that governs blood transfusion ethics. (10)

7.2 A patient with mild anaemia is refusing a blood transfusion due to their religious beliefs. (2)
Suggest two alternatives to the blood transfusion that may boost red cell production.

End of paper!