



**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: NOVEMBER 2019</b>	<b>PAPER: THEORY</b>
<b>DURATION: 3 HOURS</b>	<b>MARKS:100</b>

<b>FIRST 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 (33 MARKS)**

**QUESTION 1**

[15]

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 immunoglobulin class primarily associated with ABO antibodies is? (1)

- (A) IgG
- (B) IgM
- (C) IgE
- (D) IgA

1.5 A 25-year-old female was rushed to the hospital after a motor vehicle accident, she needs emergency red cell concentrate however, the stocks at the blood bank are running low. What is the best blood group to issue her? (1)

- (A) Fully crossmatched group specific
- (B) O+
- (C) O-
- (D) AB-

- 1.6 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
- 1.7 How would you distinguish between anti-Fy<sup>a</sup> and anti Jk<sup>a</sup> when dealing with multiple antibody identification? (1)
- (A) Lowering patient's serum pH
  - (B) Using LISS
  - (C) Treating panel with enzymes
  - (D) Longer incubation periods
- 1.8 All of the following antibodies are of class IgG except: (1)
- (A) Anti-Jk<sup>b</sup>
  - (B) Anti-N
  - (C) Anti-K
  - (D) Anti-E
- 1.9 Which phenotype is associated with resistance to malaria? (1)
- (A) Fy(a-b-)
  - (B) Fy (+b+)
  - (C) Jk (a-b-)
  - (D) Le (a+b+)
- 1.10 An antibody was detected in the screen at 37°C and did not react at the AHG phase. Which of the following antibodies do you suspect? (1)
- (A) Anti-S
  - (B) Anti-E
  - (C) Anti-N
  - (D) Anti-Jk<sup>a</sup>
- 1.11 Identify the best product used to treat Idiopathic Thrombocytopenic Purpura? (1)
- (A) Plasma
  - (B) Platelet
  - (C) Cryoprecipitate
  - (D) Whole blood

- 1.12 A patient has experienced two febrile reactions following transfusion with red cells. Identify the preferred blood component if future transfusions are necessary? (1)
- (A) Leucocyte Reduced Red Blood Cells
  - (B) Irradiated Red Blood Cells
  - (C) CMV-negative red blood cells
  - (D) Group O Rh-negative red
- 1.13 Which of the following tests is not necessary when testing cord blood? (1)
- (A) DAT
  - (B) ABO
  - (C) Rh
  - (D) Antibody screen
- 1.14 Patients receiving blood products from directed donors are at risk of which of the following adverse effects of transfusions? (1)
- (A) Febrile
  - (B) Acute Immune Haemolytic Reactions
  - (C) Graft versus host
  - (D) TRALI
- 1.15 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

**QUESTION 2****[8]**

Describe the mechanisms of the following potentiators:

- 2.1 Low ionic strength solution (2)
- 2.2 Bovine serum albumin (2)
- 2.3 Polyethylene Glycol Additive (2)
- 2.4 Proteolytic Enzymes (2)

**QUESTION 3**

**[10]**

3.0 The H antigen is a basis for the formation of all other antigens in the ABO blood group system which require addition of sugars by transfer enzymes. For each of the following blood group, identify the immunodominant sugar and the enzyme responsible for its transfer.

- a) A (2)
- b) B (2)
- c) O (2)
- d) AB (4)

**SECTION B (31 MARKS)**

**QUESTION 4**

**[21]**

4.1 Match the blood products in column A with the phrase in column B. (7)

A	B
a) Washed RCC	IgA deficiency
b) Frozen Red Cells	Factor VII
c) Irradiated Red cells	Graft vs Host Disease
d) Whole Blood	Rare Blood Groups
e) Fresh Frozen Plasma	Room temperature
f) Platelets	CPD
g) Cryoprecipitate	Thrombocytopenia

4.2 Explain the biochemical changes that stored red cells go through? (6)

4.3 Apart from CPD in whole blood, what other preservatives are added to red cell products to ensure optimum storage? (8)

**QUESTION 5**

**[10]**

5.1 Briefly Principles of the ELISA technique used in testing TTIs: (6)

5.2 Identify the most common TTIs. (4)

**SECTION C (MARKS 36)**

**[23]**

**QUESTION 6**

6.0. The following are crossmatch results of a patient of an O positive patient against O positive donors and the patient’s antibody screen results.

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

	IS	IAT	Sensitized Cells
<b>Screen 1</b>	0	0	2
<b>Screen 2</b>	0	0	2

- 6.1 Interpret the results: (4)
- 6.2 Since both patient and donor are O positives, the units are supposed to be compatible. Is this the case? Explain your answer and state further actions. (8)
- 6.3 Should the incompatible unit be transfused (if any), describe the type of reaction the incompatibility will cause. (6)
- 6.4 What would you tell a nurse that reports a transfusion reaction? (5)

**QUESTION 7**

**[13]**

- 7.1 A Rh-negative mother is pregnant with her second child and is identified to have a circulating anti-D. A KB test is performed to estimate the amount of RhIG that should be administered. You counted 1000 maternal cells and 50 foetal cells in 5 field. Estimate the amount of RhIG to be administered. Show your calculations (7)
- 7.2 Describe the guidelines used to select blood for exchange transfusions of neonates. (6)

**End of paper!**