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: JANUARY 2023	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

SUPPLEMENTARY/SECOND OPPORTUNITY PAPER	
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INSTRUCTIONS
1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

SECTION A (47 MARKS)

QUESTION 1   [5]

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 Select the term that describes the unique configuration of the antigen that allows recognition by a corresponding antibody: (1)

(A) Immunogen
(B) Epitope
(C) Avidity
(D) clone

1.2 In haemagglutination test, the antigen is?   (1)

(A) Secreted by the red cell
(B) In the red cell nucleus
(C) On the red cell membrane
(D) In plasma or serum

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

(A) X-linked Codominant
(B) X-linked Recessive
(C) Autosomal-Codominant
(D) Autosomal Recessive

1.4 What is the immunodominant sugar for the H antigen?   (1)

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

1.5 Which of the following antibodies can cause Haemolytic disease of the foetus and new-born: (1)

(A) IgA
(B) IgD
(C) IgG
(D) IgM

QUESTION 2   [30]

2.1 Define the following terms:

2.1.1 Blood Group System   (2)
2.1.2 Immunodominant Sugar   (2)
2.1.3 Dosage Effect   (2)
2.1.4 Lectin   (2)
2.1.5 Plasmapheresis   (2)

2.2 Outline the characteristics of ABO antibodies.   (5)

2.3 Bombay blood groups are usually referred to as not having any ABO antigens. Explain this   (5)
    phenomenon and how it occurs.

2.4 Explain the Fisher-Race theory of Rh inheritance.   (5)

2.5 Denote the following Weiner notations into Fisher race.   (5)

    a) DCE
    b) DcE
    c) Dce
    d) Ce
    e) CE

QUESTION 3   [12]

3.1 Scrutinize the frequency table for MNS group below and answer the questions that follow:

Phenotype	Phenotype Frequency %	
	Whites	Blacks
M+N-	28	26
M+N+	50	44
M-N+	22	30
S+s-U+	11	3
S+s+U+	44	28
S-s+U+	45	69
S-s-U-	0	Less than 1

3.1.1 What is the most frequent MNS antigen in the black population?   (1)

3.1.2 What is the most common frequent antigen in the white population?   (1)

3.1.3 Which phenotype is prevalent overall?   (1)

3.1.4 List the antibodies that the S-s-U- is likely to produce?   (2.5)

3.1.5 State whether those antibodies are IgG or IgM.   (2.5)

3.2 One of the Duffy phenotypes can resist invasion of Malaria parasite. Name the phenotype and explain this phenomenon.   (4)

SECTION B (28 MARKS)

QUESTION 4   [14]

4.1 Identify and explain the 2 methods used to produce commercial anti-sera   (6)

4.2 For each of the following tests, identify the techniques used: (4)

   a) ABO/Rh
   b) Direct crossmatch
   c) Transfusion transmissible infections testing

4.3 Explain the Direct Antiglobulin Test and its applications in blood transfusion.   (4)

QUESTION 5   [14]

5.1 At times patients are advised to get large amounts of blood drawn not for a purpose of donation but more to treat certain disorders, what is this process called and in which disorders is it indicated?   (3)

5.2 What is meant by hemovigilance, why is it important and how does appropriate documentation and record keeping positively contribute to this exercise?   (5)

5.3 List at least 6 elements of the quality management system.   (6)

SECTION C (25 MARKS)

QUESTION 6   [8]

6.1 Haemolytic disease of the foetus and new-born (HDFN) can arise from both ABO, Rh and
other antibodies. Using the following headings outline the differences between ABO and Rh
HDFN: (4)

	ABO	Rh
Severity		
Bilirubin levels		
DAT result		
Treatment		

6.2 While performing the Kleihauer-Bekte test, you count 20 foetal cells and 980 maternal cells,
calculate the volume of foetal maternal haemorrhage. Show your workings: (4)

QUESTION 7   [17]

Below are results of an antibody panel.

Donor Cell Number	D	C	E	c	e	C^W	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	Jk^b	Le^a	Le^b	M	N	S	s	P_1	Lu^a	Lu^b	IS	AHG	CC
1	0	+	0	0	+	0	+	0	0	+	0	+	+	0	0	+	0	+	+	0	0	+	+	0	+		0	2+
2	0	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+		3+	NP
3	0	0	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	0	0	+	+	0	+		0	2+
4	0	+	+	0	0	0	+	0	0	+	0	+	+	0	0	+	+	0	0	+	0	+	+	0	+		0	2+
5	0	0	0	+	+	0	0	+	0	+	0	+	+	+	+	0	0	+	+	0	+	0	+	0	+		3+	NP
6	0	0	+	+	0	0	+	+	0	+	0	+	0	+	0	0	+	0	+	0	+	+	0	+		0	2+

7.1 Show your workings on **the panel provided (see last page)** to identify the possible
antibody(ies)   (10)

7.2 What are the possible antibodies?   (2)

7.3 What techniques can be used to resolve multiple antibodies?   (5)

End of paper!

Detach and used to answer question 7

Student no:…………………………………..

	Rh-Hr						Kell						Duffy		Kidd		Lewis		MNSs				P	Lutheran		Patient Results		
	D	C	E	c	e	Cw	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	JK^b	Le^a	Le^b	M	N	S	s	P1	Lu^a	Lu^b	IS	AHG	Co
1	0	+	0	0	+	0	+	0	0	+	0	+	+	0	0	+	0	+	+	0	0	+	+	0	+		0	2+
2	+	+	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+		3+	NP
3	0	0	+	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	0	0	+	+	0	+		0	2+
4	0	+	+	0	0	0	+	0	0	+	0	+	+	0	0	+	+	0	0	+	0	+	+	0	+		0	2+
5	0	0	0	+	+	0	0	+	0	+	0	+	+	+	+	0	0	+	+	0	+	0	+	0	+		3+	NP
6	0	0	+	+	0	0	+	+	0	+	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+		0	2+