NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF CLINICAL HEALTH SCIENCES

QUALIFICATION : BACHELOR OF MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	**LEVEL:** 7
COURSE CODE: HAM711S	**COURSE NAME:** HAEMATOLOGY 3
SESSION: JULY 2023	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 122

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	MS MARIEN NAUDE DR MAURICE NYAMBUYA
MODERATOR:	DR AARON MARAMBA

INSTRUCTIONS
1. Answer ALL the questions. 2. Write clearly and neatly. 3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Pen
2. Calculator

THIS QUESTION PAPER CONSISTS OF 9 PAGES (Including this front page)

SECTION A (61 MARKS)

Question 1 **[10x1=10]**

Evaluate the statements below and select the most appropriate answer. Write only the number and the correct corresponding letter on your answer sheet.

1.1 The combination of a prolonged APTT and a remaining prolonged APTT with the mixing study procedure indicates the presence of: (1)

A) circulating inhibitor

B) factor VIII deficiency

C) anti-platelet antibodies

D) Aspirin usage

1.2 Based on the following data, what is the most likely factor deficiency considering the findings below? (1)

PT prolonged

APTT normal

TT normal

A) Factor VIII

B) Factor VII

C) Factor IX

D) Factor V

1.3 What During platelet adhesion, VWF binding to GP1b triggers intracellular signaling and the activation of: (1)

A) GP11b/111 on the platelet membrane which then binds soluble fibrinogen

B) GP111b/11 on the platelet membrane which then binds soluble fibrinogen

C) GP11b/111 on the platelet membrane which then binds soluble fibrin strands

D) GP111b/11 on the platelet membrane which then binds soluble fibrin degradation products

1.4 Which test is used to monitor Warfarin therapy? (1)

A) Bleeding time

B) Factor Assays

C) Prothrombin Time

D) Activated Partial Thromboplastin Time

1.5 Which test is used to monitor the Intrinsic pathway? (1)

A) Fibrinogen

B) DDimer

C) Prothrombin Time

D) Activated Partial Thromboplastin Time

1.6 The following leukemia is associated with Smudge Cells? (1)

A) Acute Lymphoblastic Leukaemia (L3)

B) Prolymphocytic T cell Leukaemia (PTLL)

C) Chronic lymphocytic Leukaemia (CLL)

D) Acute Promyelocytic Leukaemia (M3)

1.7 A distinctive feature seen in Burkitts Lymphoma is: (1)

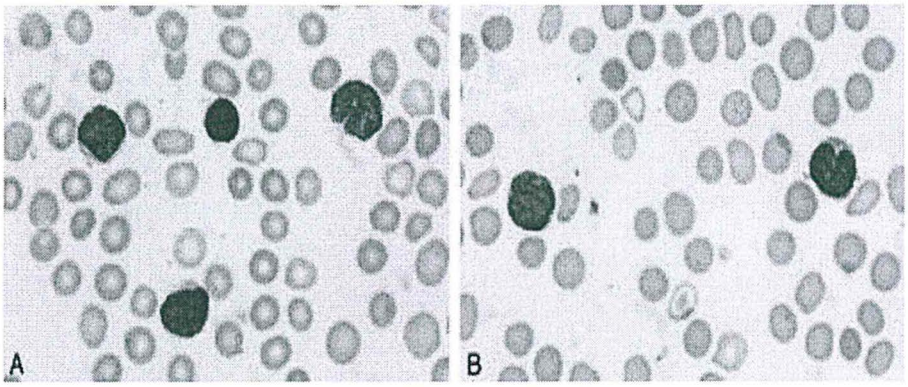
A) L2 blasts which are large heterogenous cells

B) Vacuolated blasts

C) Convoluted nucleoli blasts

D) Faggot cells

1.8 The following cells were seen on the peripheral smear of a patient who presented with lymphadenopathy, splenomegaly, and night sweats. What are the cells called? (1)



A) Plasma cells

B) Buttocks cells

C) Reed-Sternberg cells

D) Burkitt's lymphoma cells

1.9 What is the leukaemia in question 1.8 called, containing these diagnostic cells? (1)

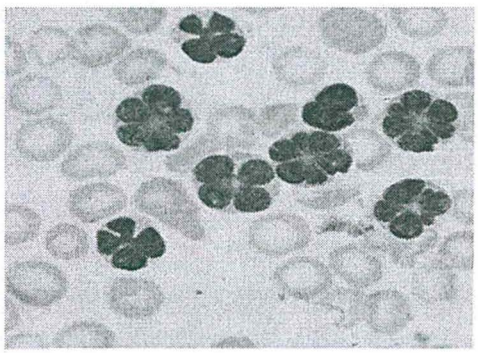
A) Prolymphocytic T cell Leukaemia (PTLL)

B) Acute Lymphoblastic Leukaemia (ALL-L3)

C) Adult T cell Leukaemia (ATLL)

D) Mantel Cell Leukaemia (MCL)

1.10 Which leukemia consist of flowery pleomorphic lymphocytes of which the nucleus is convoluted and polylobed, often resembling a clover leaf or flower? (1)



A) Prolymphocytic T cell Leukaemia (PTLL)

B) Acute Lymphoblastic Leukaemia (ALL-L3)

C) Adult T cell Leukaemia (ATLL)

D) Mantel Cell Leukaemia (MCL)

Question 2 **[28]**

Read the below case study and answer the questions following.

A 5-year-old boy was admitted in the Katutura State hospital with complaints of regular nose bleeds, lymphadenopathy, night sweats, severe fatigue, hepatomegaly and easy bruising. The Lactate Dehydrogenase of the patient came out 1080IU/L which is very high. The FBC was analyzed (table 1), a peripheral smear (image 1) and a manual differential count (table 1) was performed:

FBC:

Rbc	4.80 x 10^{12}/l	Neutrophils	10%
Hb	4.2 g / dl	Lymphocytes	2%
Hct	42.4%	Monocytes	0%
MCV	88.3 fl	Eosinophils	0%
MCH	29.7 pg	Basophils	0%
MCHC	33.6 g/dl	Abnormal cells (pictured below): Blasts	88%
WBC	150.8 x 10^{9}/l	Platelets	58 x 10^{9}/l

Table 1

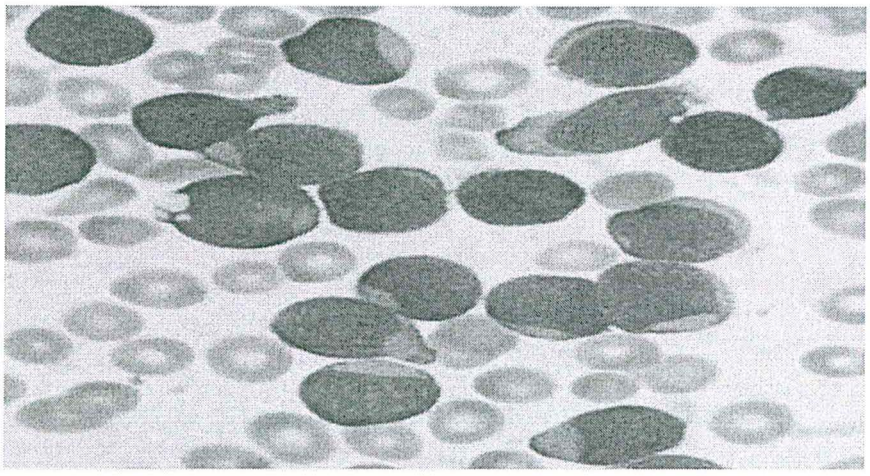


Image 1

2.1) Which leukemia is this patient most probably suffering from? (1)

2.2) Describe the clinical, physical, white cell differential and the blood film results that would be consistent with the above diagnosis. (15)

2.3) Which further testing types will you perform to confirm your diagnosis? (5)

2.4) The Immunophenotyping results of the patient's bone marrow aspirate came back from the Flowcytometry lab. Examine the results in image 2 and clearly explain the outcome of the results associated with this type of malignancy. (7)

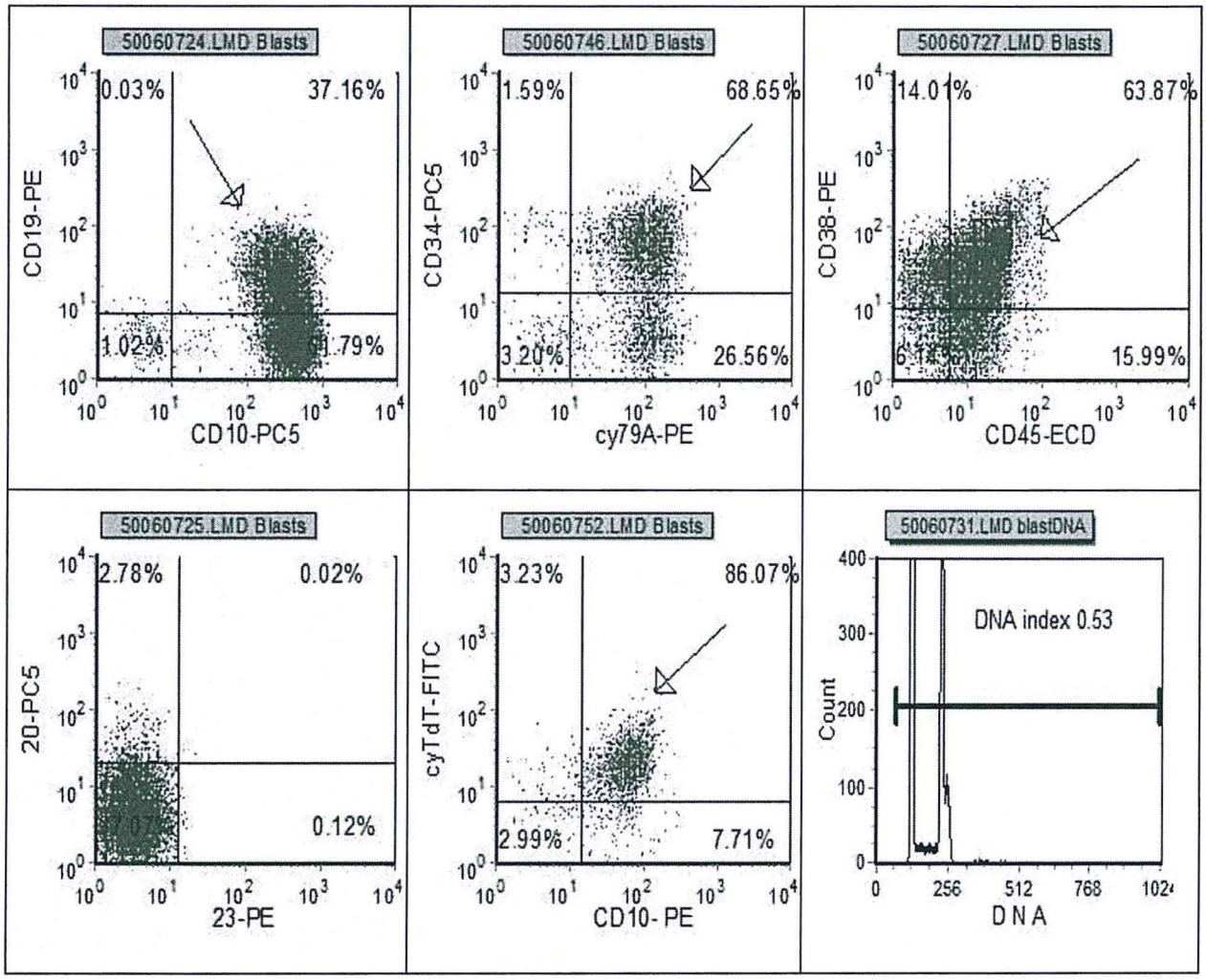


Image 2

Question 3 **[23]**

Read the below case study and answer the questions following.

A 52-year-old male presented at Mediclinic Hospital Casualty with a massive

splenomegaly and had few lymph nodes which were swollen. The doctor requested for a Full Blood Count (table 2) and Peripheral smear (image 3):

FBC:

Rbc	4.80 x 10^{12}/l	Neutrophils	6%
Hb	8.2 g / dl	Lymphocytes	13%
Hct	42.4%	Monocytes	1%
MCV	88.3 fl	Eosinophils	0%
MCH	29.7 pg	Basophils	0%
MCHC	33.6 g/dl	Immature cells (Image 3) Prolymphocytes	80%
WBC	120.8 x 10^{9}/l	Platelets	105 x 10^{9}/l

Table 2

Peripheral smear:

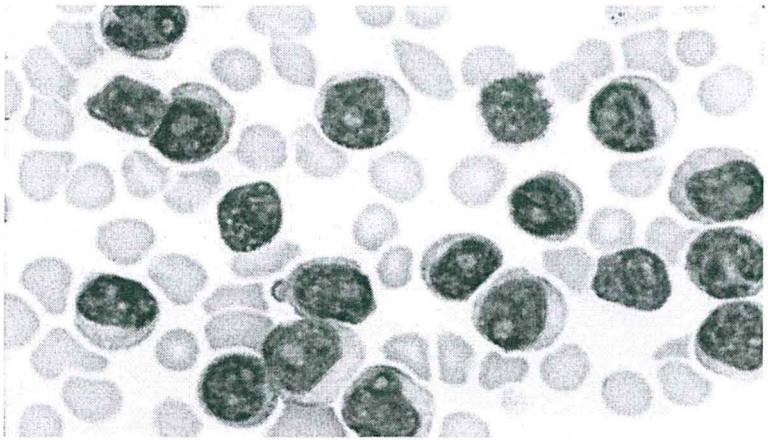


Image 3

3.1) Examine the above results and suggest which of the haematological disorder the patient is most likely to be suffering from. Motivate your answer. (10)

3.2) Name at least six Immunophenotyping markers which you would run to confirm your diagnosis, and what are the expected results of each marker? (6x2=12)

Note: (1 mark per correct marker and 1 mark for the correct result)

3.3) Why is the prognosis poor in this type of haematological disorder? (1)

SECTION B (35 MARKS)

Question 4 **[35]**

The Prothrombin Times (PT) of two patients are given in table 3.

	Patient 1	**Patient 2**
Control	11.8 seconds	11.95 seconds
PT	24 seconds	12.89 seconds

Table 3

4.1) Of each patient, discuss the findings, possible clinical causes and which tests would you proceed to confirm the possible clinical causes if any: (9)

4.2) What does INR stand for? (2)

4.3) What is the normal range for INR? (2)

4.4) Calculate the INR for Patient 1 and Patient 2 if the ISI value is 1.3 (6)

4.5) Indicate on Patient 1 and Patient 2 if their INR is low, normal, or prolonged (2)

4.6) Taking into assumption Patient 1 is on Warfarin therapy. What is the normal therapeutic range for an INR and comment if patient 1's Warfarin should be adjusted. (2)

4.7) If a sample fails to clot, what action will you do? (2)

4.8) List the clinical conditions that could indicate the need for Warfarin therapy. (6)

4.9) Which test do you use to monitor Heparin therapy and which pathway does it test for? (2)

4.10) Which anticoagulant tube do you use for coagulation and what is the ratio of blood to anticoagulant? (2)

SECTION C (26 MARKS)

Question 5 **[6]**

State whether the following statements regarding External Quality Assurance (EQA) are:

True (T) or False (F) (6X1=6)

5.1) EQA is used to assess accuracy

5.2) EQA is used mainly to assess reproducibility

5.3) Bias or systematic errors will be apparent

5.4) EQA improves the accuracy and diagnostic usefulness of test methods

5.5) EQA samples should be treated with great care and should be analyzed by the most skilled technologist who is meticulous in his/her technique

5.6) EQA results should not show imprecision, as this should have been sorted out by Internal Quality Control (IQC) before it became a problem

Question 6 **[20]**

Upon entering the laboratory, you come across a very angry Doctor who was complaining. that his ICU patient's coagulation D-Dimer result is not out yet, however, he mentioned. the Chemistry results were called to him already. In detail describe step by step how you will go about handling this client complaint as per Standard Operating Procedures.

[THE END TOTAL: 122 marks]