NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : BACHELOR OF MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	**LEVEL:** 7
COURSE CODE: HAM711S	**COURSE NAME:** HAEMATOLOGY 3
SESSION: JULY 2022	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

Supplementary / Second Opportunity Examination	
EXAMINER(S)	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 6 PAGES (Including this front page)

SECTION A (65 MARKS)

QUESTION 1

Answer all the following multiple choice questions and select the best suitable answer. **[15]**

1.1 Tartrate resistant alkaline phosphatase (TRAP) positivity is seen in all of the following conditions except (1)

a) Gaucher disease
b) Hodgkins lymphoma
c) Osteoporosis
d) Osteoclastoma

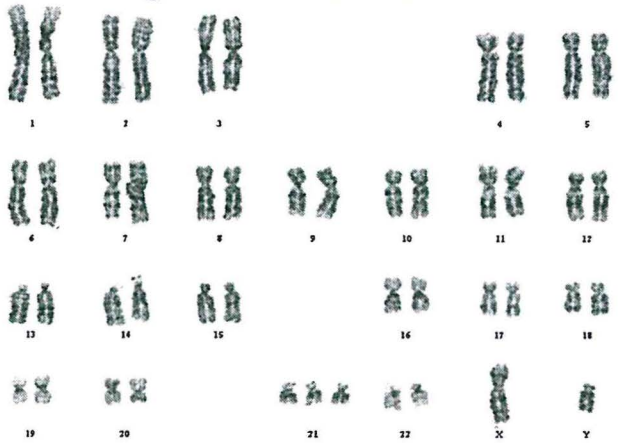
1.2 Which of the following is true regarding mantle cell lymphoma? (1)

a) It is a Hodgkin's lymphoma
b) Associated with t(8:14)
c) The blasts are light chain restricted and $CD5^+$
d) The blasts express FMC-7 +
e) Leukemic non nodal mantle cell lymphoma is an entity with significant lymphadenopathy

1.3 All of the following CD markers are positive in plasma cell leukaemia except? (1)

a) CD138
b) CD38
c) CD56
d) CD79a

1.4 The following conditions are associated with the following Karyotyping except? (1)



a) Polycythaemia Vera
b) CLL/SLL
c) B-PLL
d) Burkitt's lymphoma

1.5 Most cases of acute leukaemia in children are of which type: (1)

a) T-cell ALL

b) Mature B-cell ALL
c) Hairy cell leukaemia
d) Pre-B-cell ALL

1.6 Acute leukaemias are often associated with which of the following? (1)
a) Bleeding
b) Bruising
c) Tiredness
d) All of the above

1.7 The following surface marker results were obtained with lymphocytes from a 21-year-old man with a lymphocytosis of 16×10^9/L. Percentage of peripheral lymphocytes reactive with antisera to: Kappa = 6%; Lambda = 4%; CD19 = 10%; CD11c = 0%; CD3 = 81%; CD56 = 6%. Which ONE is the most likely diagnosis? (1)
a) Early chronic lymphocytic leukaemia
b) Sézary syndrome
c) Non-Hodgkin's lymphoma
d) Infectious mononucleosis

1.8 Chronic lymphocytic leukaemia is commonly associated with which one feature of those listed below? (1)
a) Invariably a rapidly demise
b) A slow but progressive course
c) Overwhelming bleeding
d) Hepatitis

1.9 The type of leukaemia most likely to have skin involvement is: (1)
a) Sézary syndrome
b) Plasma cell leukaemia
c) Hairy cell leukaemia
d) Acute leukaemia

1.10 Bence Jones proteins are (1)
a) Fragments of transferrin
b) Monoclonal free light chains
c) Beta 2-microglobulin
d) Polyclonal free light chains

1.11 Waldenström's Macroglobulinaemia patients often subsequently develop which one of the following? (1)
a) Non-Hodgkin's lymphoma
b) Hyperviscosity syndrome
c) Multiple myeloma
d) Duodenal ulcer

1.12 Which of the following intitates he coagulation casacade in vivo? (1)

a) Factor XII
b) Thrombin
c) Tissues factor
d) Prekallikrein

1.13 Which of the following anti-coagulating substances acts on factor V and VIII (1)

a) APT
b) Protein C
c) Plasmin
d) t-PA

(1)

1.14 What does von Willebrand factor do?

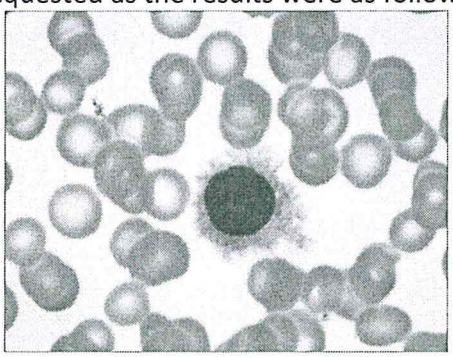
a) Binds platelets to each other
b) Binds platelets to the subendothelium
c) Binds platelets to the phospholipids
d) Cleaves factor V

1.15 Which of the following is a cofactor? (1)

a) XII
b) X
c) VIII
d) XII

QUESTION 2 **[10]**

A 65-year-old man was admitted to a hospital presenting with lymphadenopathy, splenomegaly and lethargy. In addition, he appeared easily bruised. A peripheral blood smear was requested as the results were as follows:



2.1 Identify the middle cell and attempt a possible diagnosis (1)

2.2 What would you expect the complete blood count results to be? (3)

2.3 What other **three** tests will you request to confirm this diagnosis including the expected results? (6)

QUESTION 3 **[25]**

3.1 By means of a short essay explain the varying roles of thrombin during injury or inflammation. (15)

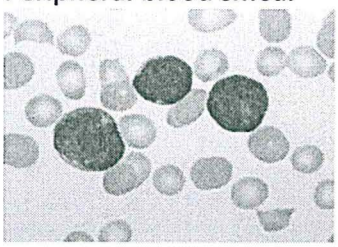
3.2 D-dimers are often an indication of an abnormal coagulation process. How are these products formed in the body? (5)

3.3 Patients suffering from acute leukaemia usually suffer from infection, fatigue, shortness of breath, bruising and bleeding. Explain why they suffer from these symptoms (5)

QUESTION 4 **[15]**

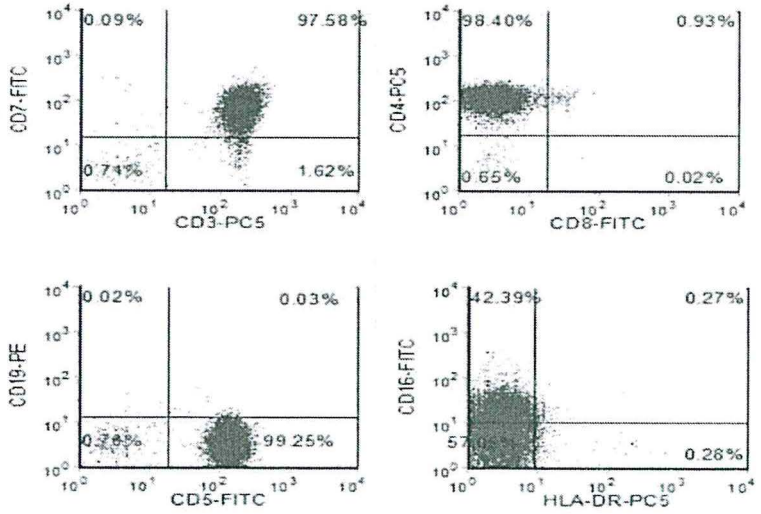
A seven-year-old boy who had previously been very healthy and active was brought to his doctor with acute sepsis and lymphadenopathy. An ultrasound revealed a large mass in his thorax region. A peripheral blood smear showed the following cells, and a lymphoproliferative disorder was suspected. Cytochemistry analysis and flow cytometry were requested, and the results are below.

Peripheral blood smear



Cytochemistry results
Myeloperoxidase – Negative
Sudan black – Negative
Acid Phosphatase - "Polar dot" or localised positivity
Non-specific esterase - "Polar dot" or localised positivity

Flowcytometry results



4.1 Examine the above results and suggest which of the lymphoproliferative disorders is this most likely to be. Explain your answer. (10)

4.2 Explain the relevance of including CD19 and HLA-DR in the panel of antibodies. (5)

SECTION B (35 MARKS)

QUESTION 5 **[15]**

A 21-year-old HIV+ male was seen at the clinic for routine full blood count and CD4+ count.

5.1 Which of the full blood count parameters is often raised on anti-retroviral therapy? (1)

5.2 What other full blood count parameters are abnormal in patients with HIV? (1)

5.3 Why do HIV+ patients have increased Erythrocyte Sedimentation Rate (ESR)? (1)

5.4 What is the absolute CD4 count reference range of a normal adult? (1)

5.5 At what absolute CD4 count is ARV therapy recommended? (1)

5.6 CD4 counts are measured using flow cytometry. Discuss the principles of flowcytometry. (10)

QUESTION 6 **[20]**

The following questions pertain to quality management system, an integral part of good clinical laboratory practice.

6.1 Discuss how non-conformances are handled. (8)

6.2 Good housekeeping improves the working environment. This means better working conditions, which encourages workers to more efficient, resulting in increased production.

6.2.1 Name 6 benefits of ORDER (6)

6.2.2 Name 6 signs of DISORDER (6)

Total [100 marks]