*"Investing in Africa's Future"*

# COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

## DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

## BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

## NSLS 407: HAEMATOLOGY II

## END OF SECOND SEMESTER FINAL EXAMINATIONS

**22 April 2022**

**LECTURER: DR T.T MUTIZE**

**DURATION: 3 HOURS**

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***INSTRUCTIONS***

1. Write your candidate number on your answer sheets.
2. Answer any **2** questions of your choice from the given three questions.
3. Each full question carries 100 marks.
4. Submit your answer scripts as word documents.
5. Use the following specifications in your answer scripts:
   Font: Times New Roman
   Font size: 12
   Line spacing: 2.0
6. Credit will be given for logical, systematic and neat presentations.

**Question 1**

A 17-year-old student presented to the emergency department at Old Mutare Mission Hospital with a 2-day history of chills, excessive sweating, nausea, and general malaise. She had recently returned from a weekend outing in Gokwe. On examination she had a fever of 39˚C, she had mild jaundice and a mild splenomegaly.

The doctor ordered a full blood count examination of the thin and thick peripheral blood films and the results are shown in **Table 1, Figures 1 and 2,** respectively.

**Table 1:**

| **Parameter measured** | **Patient results** | **Reference values** |
|---|---|---|
| WBC ($X10^9$/L) | 13.2 | 4.5-11 |
| HGB (g/Dl) | 8.0 | 12-15 |
| HCT (%) | 26.0 | 35-49 |
| MCV (fL) | 93.0 | 80-100 |
| Platelets ($X10^9$/L) | 100 | 150-450 |
| Neutrophils | 7.4 | 2.5-7.5 |
| Lymphocytes | 0.84 | 1.0-4.5 |
| Monocytes | 2.08 | 0.2-0.8 |
| Basophils | 0.06 x 10^9/L | <0.1 |
| Eosinophils | 0.24 | 0.01-0.5 |

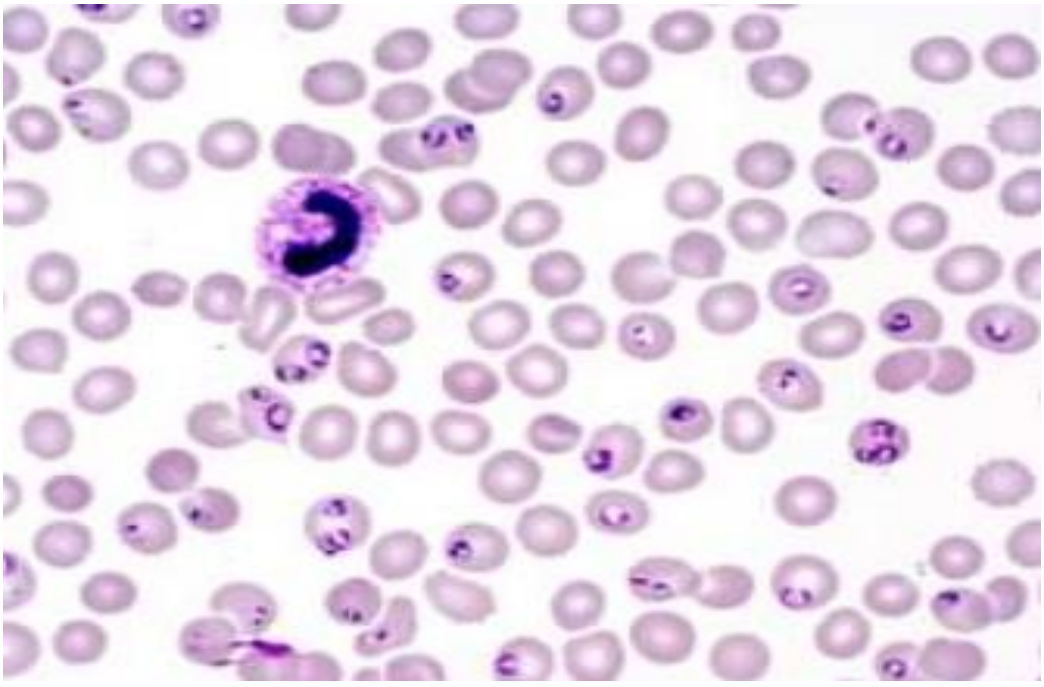

**Figure 1:Thin smear**

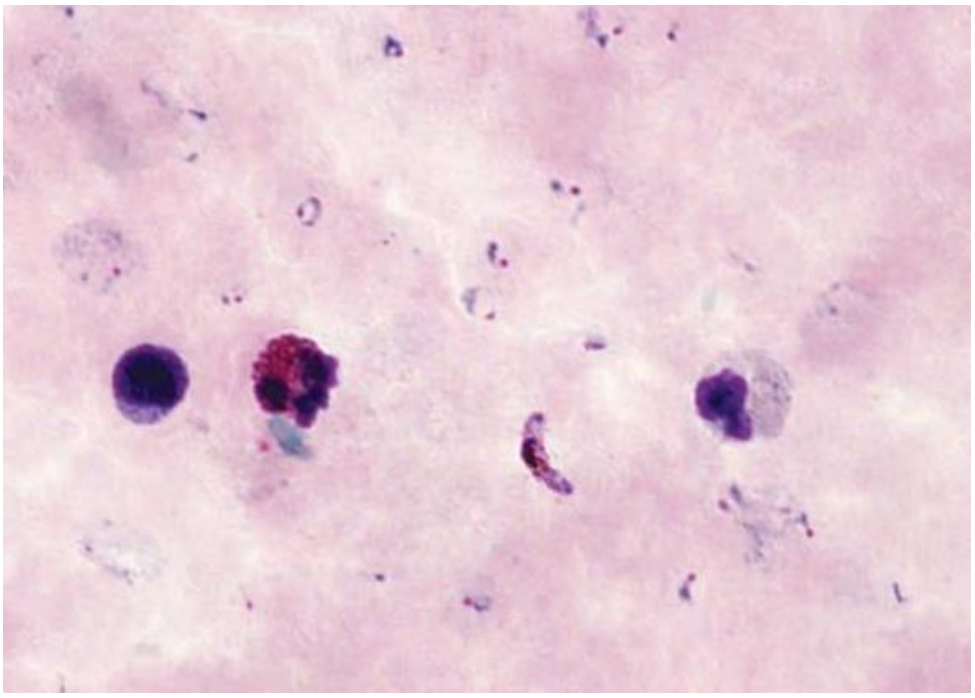

**Figure 2: Thick smear**

**a.** What is the most likely diagnosis in this patient [5marks]

**b.** Comment on the clues in the history and examination findings to support this diagnosis? [20 marks]

**c.** Describe the full blood count results above and comment on the likely cause of any abnormalities [25marks]

**d.** Decribe the thick and thin smears above and describe how the smears may help you with species identification [25marks]

**e.** Which other exotic haemoparasite, that may be diagnosed in patients travelling from North America or Europe is known to be confused with this diagnosis? Explain the similarities and differences between the two diagnoses [25 marks]

**Question 2**

A 25-year-old woman, **Chipo** was brought to the casualty department after having experienced a tonic-clonic seizure. The woman had appeared confused for the preceding three hours. On examination, she was febrile and appeared slightly confused. Neurologic and physical examination findings were normal. Her Laboratory testing results are shown in **Table 1** and the peripheral blood smear is shown in **Figure 1.**

**Table 1**: **Laboratory test results for Chipo**

| Parameter | Result | Reference Range |
|---|---|---|
| Hemoglobin, g/dl | 9 | 12–15 |
| Platelet count, $\times 10^9$/L | 55 | 150–450 |
| Leukocyte count, $\times 10^9$/L | 7 | 3.5–10.0 |
| Creatinine, mg/dl | 2.2 | 0.8–1.3 |

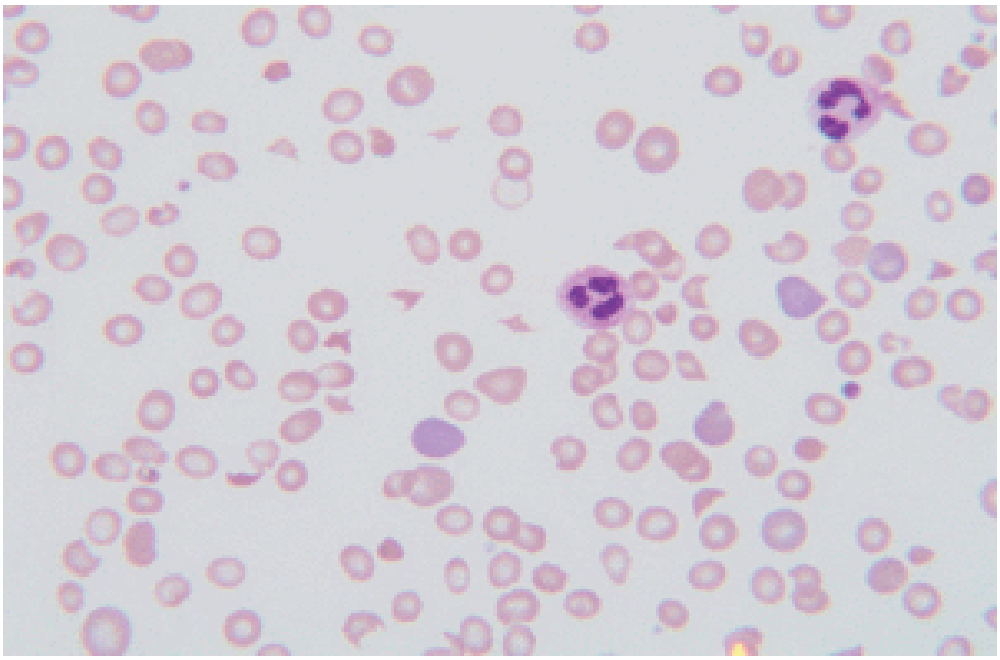

**Figure 1: Chipo's blood film**

**a)** Interpret the **(i)** results of the blood investigations ( 20 marks)
**(ii)** important findings on the peripheral smear (15 marks)

**b)** What is the most likely diagnosis for **Chipo** (5 marks)

**c)** List and describe how you can differentiate the causes of micoangiopathic haemolytic anaemia (50 marks)

**d)** Discuss what you would consider as the treatment of choice for **Chipo** (10 marks)

**Question 3**

A 17 year old boy who is known with severe Haemophilia A since childhood presents to Old Mutare Hospital complaining of a swollen left knee.

On examination, the doctor noted that besides the swollen and painful left knee which had brought the boy to hospital, he also had swelling and deformity of the right knee and left elbow.

The doctor ordered a full blood count and a set of coagulation tests from the laboratory and the results are shown in Tables 2 and 3. A peripheral smear was also done and the results are shown in Figure 3.

**Table 2: Full blood Count results for the boy**

| **Parameter measured** | **Patient results** | **Reference values** |
|---|---|---|
| WBC ($X10^9/L$) | 7.2 | 4.5-11 |
| HGB (g/dl) | 11.0 | 12-15 |
| HCT (%) | 34.0 | 35-49 |
| MCV (fL) | 77.0 | 80-100 |
| Platelets ($X10^9/L$) | 470 | 150-450 |

**Table 3: Coagulation results for the boy**

| **Parameter measured** | **Patient results** | **Range** |
|---|---|---|
| PT | 13 | 11-16 |
| aPTT | 86 | 26-34 |
| TT | 20 | 18-24 |

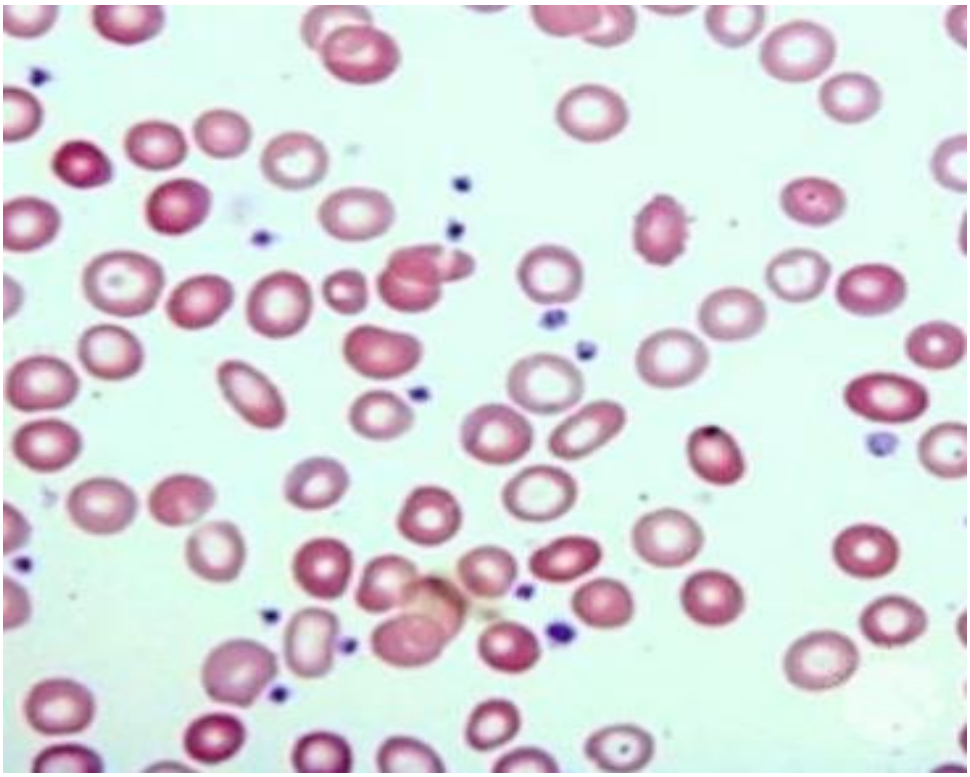

**Figure 3: Peripheral smear results for the boy**

**a)** Why does the boy have multiple joints that are swollen and deformed. [5marks]

**b)** Describe the results of the full blood count and peripheral smear for the boy and suggest a reasonable explanation for any abnormalities that may be present. [30marks]

**c)** Describe the results of the coagulation studies for the boy and suggest a reasonable explanation for any abnormalities that may be present [5marks]

**d)** Explain the principle of mixing studies in coagulation, how you would set up the experiment, interpret the results, and explain if mixing studies should be done for this patient and how they will help the doctor to manage the patient. [50marks]

**THE END**