UNIVERSITY OF JAFFNA, SRI LANKA

FACULTY OF ALLIED HEALTH SCIENCES

SECOND YEAR FIRST SEMESTER EXAMINATION IN BScHons (MLS) - 2021

MLSHE 2115 HAEMATOLOGY I

PAPER II

Date: 08.03.2023 **Time: 2 Hours**

ANSWER ALL SIX QUESTIONS.

1. Iron metabolism plays a major role in erythropoiesis..
   - **1.1.** Discuss iron absorption in the human gut. (40 marks)
   - **1.2.** Briefly describe the role of Hepcidin in iron homeostasis. (30 marks)
   - **1.3.** State the classical full blood count and serum iron study findings of iron deficiency anaemia. (30 marks)

2. Haematopoiesis is the production of blood cells from bone marrow.
   - **2.1.** List five (5) characteristics of a haematopoietic stem cell. (20 marks)
   - **2.2.** Diagrammatically illustrate the sequence of development of red blood cells and neutrophil from bone barrow. (60 marks)
   - **2.3.** Briefly explain how you would morphologically differentiate a mature neutrophil from eosinophil under a light microscope. (20 marks)

3. Automated haematology analyzers play a major role in generating Full Blood Count reports over manual methods.
   - **3.1.** List five (5) advantages of automated hematology analyzers. (20 marks)
   - **3.2.** Briefly explain the working principle of the following cell counting techniques used in the automated FBC analyzers.
     - 3.2.1. Electrical impedance (20 marks)
     - 3.2.2. Light scatter (20 marks)
   - **3.3.** Briefly outline the principle of the following laboratory tests.
     - 3.3.1. Hemoglobin estimation by haemoglobincyanide method (20 marks)
     - 3.3.2. Reticulocyte count (20 marks

4. Write short notes on

4.1. Principle and clinical application of Romanowsky stains. (35 marks)

4.2. Principle of manual WBC counting using a counting chamber and its limitations. (35 marks)

4.3. Common anticoagulants used in a Haematology laboratory. (30 marks)

5. The laboratory report of a 55-year-old male who presented with tiredness and a sore mouth at the OPD clinic of Teaching Hospital Jaffna, is given below.

White blood cells	3.3×10^9 /L
Hemoglobin concentration	4.9 g/L
Platelet	95×10^9 /L
Mean corpuscular volume (MCV)	112 fL
Blood film examination	oval macrocytes with hypersegmented neutrophils

5.1. What is the most likely diagnosis? (15 marks)

5.2. Briefly explain how you have diagnosed the condition mentioned in 5.1. (35 marks)

5.3. List possible causes for the diagnosis mentioned in 5.1. (30 marks)

5.4. Briefly describe the investigations that support and confirm the above diagnosis. (20 marks)

6. Pernicious anaemia is an autoimmune disease.

6.1. Briefly describe how the presence of autoantibodies causes B12 deficiency in pernicious anaemia. (50 marks)

6.2. Explain how Vitamin B12 deficiency causes megaloblastic anaemia. (50 marks)