



UNIVERSITY OF JAFFNA, SRI LANKA
SECOND YEAR FIRST SEMESTER EXAMINATION IN
B.Sc. (HONS) IN MEDICAL LABORATORY SCIENCES - 2019
MLSHE 2125 HAEMATOLOGY I

PAPER II

Date: 17.11.2021

Time: 2 Hours

ANSWER ALL EIGHT QUESTIONS.

1.
 - 1.1. Define "Haematopoietic stem cell". (10 marks)
 - 1.2. List four (4) characteristics of Haematopoietic stem cells. (20 marks)
 - 1.3. Draw a schematic diagram to show the process of erythropoiesis. (30 marks)
 - 1.4. Differentiate the "promyelocyte" and "metamyelocyte" based on their cell size, nuclear and cytoplasmic characteristics, and presence of granules. (40 marks)

2.
 - 2.1. List two (2) different types of dietary iron with examples. (10 marks)
 - 2.2. Describe how dietetic iron is absorbed from the gut in humans. (40 marks)
 - 2.3. Define "anaemia". (10 marks)
 - 2.4. Describe the laboratory diagnosis of iron deficiency anaemia. (40 marks)

3.
 - 3.1. List four (4) causes for Vitamin B12 (Cobalamin) deficiency. (20 marks)
 - 3.2. Briefly explain how Vitamin B12 deficiency causes megaloblastic anaemia. (50 marks)
 - 3.3. Briefly describe how the presence of antibodies against the Intrinsic Factor causes the development of megaloblastic anaemia. (30 marks)

4.

4.1. List three (3) anticoagulants commonly used in the Haematology laboratory. (15 marks)

4.2. Name one (1) haematological investigation which can be performed in each of the anticoagulated samples mentioned in 4.1. (15 marks)

4.3. Briefly explain the mode of action of the anticoagulants mentioned in 4.1. (45 marks)

4.4. List five (5) specimen collection and handling errors that can lead to misleading results in the haematology laboratory. (25 marks)

5.

5.1. Name two (2) stains that can use for reticulocyte count. (20 marks)

5.2. Outline the principle of reticulocyte count. (30 marks)

5.3. List four (4) causes for reticulocytosis. (20 marks)

5.4. Name three (3) red cell inclusions which need to be differentiated from reticulocyte during reticulocyte counting. (30 marks)

6.

6.1. Write down the principle and application of the following cell counting techniques used in the automated full blood count (FBC) analyzers.

6.1.1. Electrical impedance. (30 marks)

6.1.2. Light scatter. (30 marks)

6.2. Write three (3) different methods which can use to calibrate automated blood cell counter. (40 marks)



7. A report of a male patient who has attended the OPD clinic of Teaching Hospital, Jaffna, is given below.

White blood cells	$8 \times 10^9 /L$
Red blood cells	$3.5 \times 10^{12} /L$
Hemoglobin concentration	115 g/L
Hematocrit	0.38
Platelet	$250 \times 10^9 /L$

7.1. State the most likely abnormal results in this report. (20 marks)

7.2. Calculate the following red cell parameters for the above patients.

7.2.1. Mean Corpuscular Volume (MCV). (20 marks)

7.2.2. Mean Corpuscular Hemoglobin (MCH). (20 marks)

7.2.3. Mean Corpuscular Hemoglobin Concentration (MCHC). (20 marks)

7.3. List four (4) causes for the elevated level of MCV. (20 marks)

8. Write short note on

8.1. Principle and clinical application of Leishman stain. (50 marks)

8.2. Principle of manual WBC counting and its limitations. (50 marks)