



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya

Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,

Website: [info@must.ac.ke](mailto:info@must.ac.ke) Email: [info@must.ac.ke](mailto:info@must.ac.ke)

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## University Examinations 2024/2025

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR  
OF MEDICAL LABORATORY SCIENCES

### HML 3315: HAEMATOLOGY

DATE: JANUARY 2025

TIME: 3 HOURS

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#### INSTRUCTIONS:

Answer *All* questions

Ensure that all your answers are properly numbered

Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark

Part II: Short Answer Questions – Answer questions following each other on the answer booklet

Part III: Long Answer Questions – Answer each question on the answer booklet

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#### SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)

1. When Two  $\delta$  — ALA molecules condense in presence of  $\delta$ -ALA — dehydrase enzyme, they form:-
  - a) Porphobilinogen
  - b) Delta aminolevulinic acid
  - c) Uroporphobilinogen
  - d) Cor-proporphyrinogen
  - e) Haemoglobin
2. Microcytic hypochromasia is associated with:-
  - a) Sickle cell disease

- b) Aplastic anaemia
  - c) Iron deficiency anaemia
  - d) Alpha thalassaemia
  - e) Spherocytic anaemia
3. A patient had the following laboratory findings; Normal MCI-I, MCI-IC, and MCV, while WBC, RBC and Platelet total were reduced. What could the patient be suffering from:-
- a) Megaloblastic anaemia
  - b) Aplastic anaemia
  - c) Pernicious anaemia
  - d) Iron deficiency anaemia
  - e) Sideroblastic anaemia
4. Variation in both size and shape of red blood cells is known as:-
- a) Anisocytosis
  - b) Anisopoikilocytosis
  - c) Poikilocytosis
  - d) Macrocytosis
  - e) Polychromasia
5. Increased osmotic fragility test is not associated with:-
- a) Haemolytic disease of the new born
  - b) Spherocytosis
  - c) Enzymopath ies
  - d) Autoimmune haemolytic anaemia
  - e) Iron deficiency anaemia
6. Iron deficient cells are
- a) Hypercellular
  - b) Macrocytic
  - c) Megalocytic
  - d) Hypochromic

- e) Hypocellular
7. Colorimetric methods of haemoglobin estimation include
- a) Alkaline haematin
  - b) Sahli method
  - c) Spencer method
  - d) Copper sulphate method
  - e) All of the above
8. The following blood cell values are used in the classification of anaemia
- a) RDW
  - b) PCV
  - c) RBC (T)
  - d) WBC (T)
  - e) None of the above
9. Which of the following is used for reticulocyte count preparation
- a) Leishman stain
  - b) Jenner's stain
  - c) Brilliant cresyl blue
  - d) Giemsa stain
  - e) Crystal violet
10. During staining of a thin blood film using Leishman stain, the film is flooded with the stain and left for three minutes in order to
- a) Destroy white cells
  - b) Differentiate the cells
  - c) Stain the cells
  - d) Fix the cells
  - e) Destroy the platelets
11. A raised ESR may indicate
- a) Iron deficiency syndrome

- b) Inability to form rouleux
- c) Haemolytic state
- d) Chronic organic condition
- e) None of the above

12. Which of the following is a platelet diluting fluid

- a) Toisson's
- b) 1% ammonium oxalate
- c) Turks solution
- d) Hayem's
- e) Drabkin's

13. The following blood cell types are synthesized in the lymphoid tissue

- a) Lymphocytes
- b) Erythrocytes
- c) Eosinophils
- d) Basophils
- e) Platelets

14. Normal haemoglobin values for an adult male are

- a) 14 — 18 gm/dl
- b) 14 — 19 gm/dl
- c) 11.5 - 16.5 gm/dl
- d) 11.5 — 18 gm/dl
- e) 10 — 14 gm/dl

15. One of the principal sites of blood formation in an adult is

- a) Liver
- b) Bone marrow
- c) Spleen
- d) Kidney
- e) All of the above

16. A chipped dirty spreader if used in making thin blood film will result in
- a) Thick film
  - b) Thin film
  - c) Longitudinal lines and uneven tails
  - d) Horizontal lines and uneven tails
  - e) Squash film
17. The following haemoglobins are resistant to alkaline denaturation
- a) Hb C
  - b) HbA
  - c) HbA2
  - d) HbF
  - e) HbD
18. Normal packed cell volume range for males is
- a) 45 - 75%
  - b) 76 – 96%
  - c) 40 \_54%
  - d) 1 - 9 %
  - e) 0 - 20 %
19. When 20k11 of blood are added to 5 mls of Drabkin's solution we get a dilution factor of
- a) 1:250
  - b) 1:25
  - c) 1:500
  - d) 1:501
  - e) 1:25 1
20. The following is NOT a typically a sign of Leukemia
- a) Frequent infections
  - b) Easy bruising
  - c) Enlarged lymph nodes

- d) Fatigue
- e) Severe joint pain

**SECTION B: SHORT ANSWER ALL QUESTIONS (40 MARKS)**

1. Outline five (5) factors which affect iron absorption (5 marks)
2. Define plasma and describe four (4) functions of plasma (5 marks)
3. Explain intrinsic factor (5 marks)
4. List five (5) congenital group A red cell membrane defects (5 marks)
5. Name five (5) conditions which lead to reduced OBT outlining the reasons (5 marks)
6. Explain five (5) characteristics of thrombasthenia (5 marks)
7. Outline five (5) differences between intrinsic and extrinsic coagulation pathways (5 marks)
8. Name ten (10) abnormalities displayed by leukaemic cells (5 marks)

**SECTION C: LONG ANSWER TWO QUESTIONS (40 MARKS)**

1. Describe ten (10) observations seen in a peripheral blood film of someone with iron deficiency anaemia (20 marks)
2. Explain the etiological classification of anemia (20 marks)
3. Outline the pathogenesis and diagnosis of multiple myeloma (20 marks)