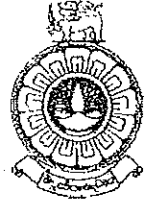


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THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCES
ACADEMIC YEAR 2018/2019 – SEMESTER II



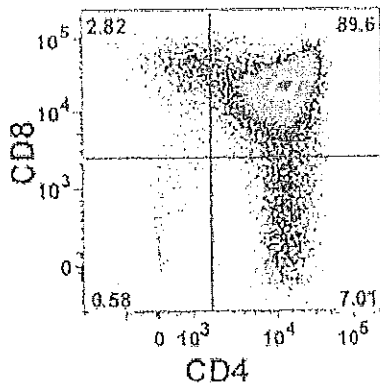
BACHELOR OF MEDICAL LABORATORY SCIENCES (BMLS) HONOURS
MLU3245/MDU5454 – ADVANCED CLINICAL HEMATOLOGY – LEVEL 5
FINAL EXAMINATION DURATION: THREE (03) HOURS

DATE: 29TH NOVEMBER 2019

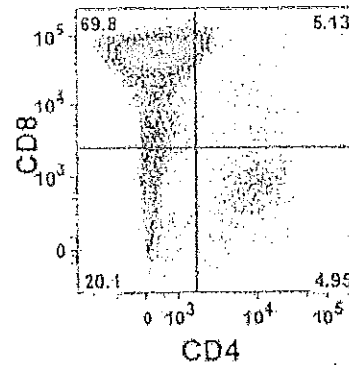
TIME: 09.30AM – 12.30 PM

PART B – Structured Essay Questions

1. A 32-year-old male was diagnosed as HIV positive and the management of the patient is being done at Anti-STD Clinic. Flowcytometry analysis of his blood shows CD4/CD8 results as follows

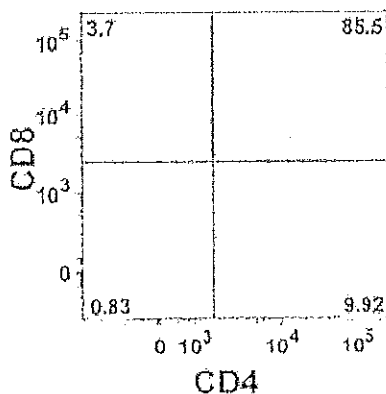


Healthy Control



HIV Patient

- 1.1. Comment on the flowcytometry analysis CD4/CD8 results of Healthy Control and HIV Patient. (20 marks)
- 1.2. Explain the importance of analyzing CD4/CD8 in HIV based on the results that you mentioned in 1.1. (30 marks)
- 1.3. Assuming the patients was successfully treated for HIV for 2 weeks. Interpret the possible flowcytometric analysis results in the dot plot given below. (20 marks)



- 1.4. Briefly describe how CD8 level of HIV patient is assayed from a fresh blood sample. (Technical details are not needed) (30 marks)

2. Iron overload can be primary and secondary. Primary iron overload stems from an inherent defect in iron regulation that results in continuous over absorption of iron from the gastrointestinal tract. Secondary iron overload is resulted due to either increase intake of iron or blood frequently.
- 2.1. List three (03) main protein molecules which are involved in regulation of iron levels in the body. (15 marks)
- 2.2. List three (03) sites in the body the absorbed iron is stored. (15 marks)
- 2.3. Describe the terms "Total Iron Binding Capacity (TIBC)" and "% Transferrin Saturation". (20 marks)
- 2.4. Explain how the TIBC and % Transferrin saturation are used as diagnostic tests for iron overload states. (25 marks)
- 2.5. Describe briefly the role of 'Hepcidin' in iron metabolism (20 marks)
- 2.6. Name one molecular defect that leads to primary iron overload (Hemochromatosis). (05 marks)

3. A 3-year old boy presents with a history of joint bleeding. His laboratory report is shown below.

Laboratory Investigation	Results
Bleeding time	2 min.
Prothrombin time (PT)	Test – 12 sec. Control – 12 sec.
Activated partial thromboplastin time (APTT)	Test – 68 sec. Control – 32 sec.
Thrombin time (TT)	Test – 20 sec. Control – 19 sec.

- 3.1. How do you collect blood samples for PT, APTT and TT? (15 marks)
- 3.2. Comment on the results of PT, APTT and TT in the above table. (15 marks)
- 3.3. What further investigations would you perform to arrive at a diagnosis? (15 marks)
- 3.4. Explain the procedure and rationale for each of the above-mentioned investigations in 3.3. (40 marks)
- 3.5. Name three (03) acquired coagulation disorders that may prolong the APTT. (15 marks)

4. A 25-year-old man presents with symptoms and full blood count reveals Hb = 60g/L, Neutrophils = $0.5 \times 10^9/L$, MCV = 110 fl, Platelets $23 \times 10^9/L$.

- 4.1. Discuss the above findings (20 marks)
- 4.2. What are the possible causes, give reasons? (20 marks)
- 4.3. What do you expect reticulocyte count and reticulocyte index in this patient? (20 marks)
- 4.4. If this patient's bone marrow had only 10% cellularity with white fatty areas and consisted of few lymphocytes with no abnormal cells what is the most likely diagnosis? Give reasons. (20 marks)
- 4.5. What cytochemical stain is used to identify fibrosis in the trephine biopsy? (10 marks)
- 4.6. What is the confirmatory test for PNH? (10 marks)

PART C – Essay Questions

1. Explain the pathological basis of the following.
 - 1.1. Defective immunity in multiple myeloma patients (30 marks)
 - 1.2. Usage of drug warfarin as an anticoagulant (40 marks)
 - 1.3. *JAK2* mutation and erythrocytosis (30 marks)

2. Define leukocytosis and describe the causes, pathological basis and laboratory performed to confirm the diagnosis in leukocytosis. (100 marks)

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