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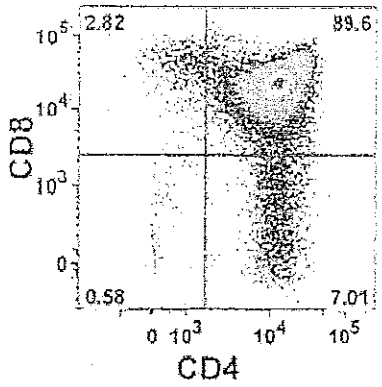
THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCE
ACADEMIC YEAR 2018/2019 – SEMESTER II

BACHELOR OF MEDICAL LABORATORY SCIENCES (BMLS) HONOURS
MDU5401 – ADVANCED HEMATOLOGY – LEVEL5
FINAL EXAMINATION DURATION: THREE (03) HOURS

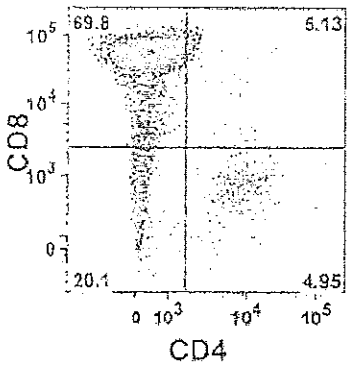
DATE: 29TH NOVEMBER 2019 TIME: 09.30AM –12.30 PM

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

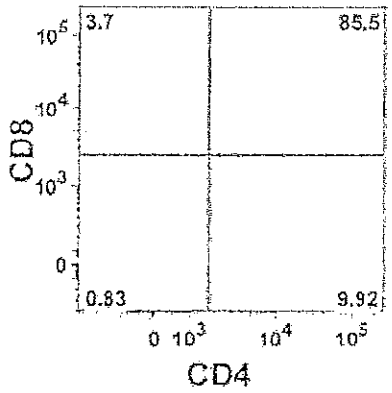


HIV Patient

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. Interprets 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)

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2. **A 42-year-old woman presented with mild fever and anemia. Results of all the laboratory investigations that received to the laboratory are tabled and other laboratory investigations are yet to be received.**

Investigation	Result
WBC (White Blood Cell Count)	16.3 $X10^9$ /L (163,000 /Cumm)
DC (Differential Count)	Abnormal cells – 25, N – 46, L – 23, E – 03, M - 03
Hb	108 g/L
HCt	31.2 %
Platelet Count	100×10^9/L
RBC Count (Red Blood Cell Count)	3.48 $X10^{12}$ /L
MCV	89.6 fL
MCH	31.0 pg
MCHC	32.72 %
RDW- CV	23.4
Bone Marrow	Erythropoiesis – Mildly suppressed Granulopoiesis – Increased with myeloblasts -37% Thrombopoiesis – Reduced.
Periodic Acid Shiff (PAS)	Abnormal cells one PAS negative
Sudan Black B	.....

2.1. Which type of cells would you expect as "Abnormal Cells" in the Differential Count? (10 marks)

2.2. Write a likely blood picture report for this patient. (20 marks)

2.3. Describe what the bone marrow aspirate for Sudan Black B is likely to show (20 marks)

2.4. What is the most likely diagnosis? Give reasons (25 marks)

2.5. List the panel of immunomarkers you would use when performing flow cytometry in the patient and give the expected results (25 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 = 0.5×10^9/L, MCV = 110 fl, Platelets 23×10^9/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)

4.4. What cytochemical stain is used to identify fibrosis in the trephine biopsy? (10 marks)

4.5. What is the confirmatory test for PNH? (10 marks)

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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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