

COMMONWEALTH OF AUSTRALIA

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Family Name	
Given Names	
Student Number	
Teaching Period	Semester 2, 2016

FINAL EXAMINATION	DURATION				
MLS101 – Haematology 1	<table border="1"> <tr> <td>Reading Time:</td> <td>10 minutes</td> </tr> <tr> <td>Writing Time:</td> <td>120 minutes</td> </tr> </table>	Reading Time:	10 minutes	Writing Time:	120 minutes
Reading Time:	10 minutes				
Writing Time:	120 minutes				

INSTRUCTIONS TO CANDIDATES

Section A should be answered on the Answer Sheet provided. Please ensure that your name and student number have been written on the Answer sheet and place in the completed answer Booklet.

Section B should be answered in separate booklets.

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a CLOSED BOOK examination

Any calculator is permitted

No handwritten notes are permitted

Any hard copy, unannotated English dictionary is permitted

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 8 Page Book Faculty/School Multiple Choice Answer Sheet

**THIS EXAMINATION IS PRINTED
DOUBLE-SIDED.**

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BLANK.**

Section A

Multiple Choice Questions

Total No of Marks for this section: (60)

This section should be answered on the Answer Sheet provided. Please ensure that your name and student number have been written on the Answer sheet and place in the completed answer Booklet.

Each question is worth 1 mark. Suggested Time allocation for Section A: 70 minutes

END OF SECTION A

Section B
Short answer
Total Number of marks for this section: (40)

This section should be answered in separate booklets.
Instructions for each test have been given separately.
Suggested Time allocation for Section B: 50 minutes

Question 1

[10 marks]

Describe **FOUR** conditions where full blood count are incorrectly measured by haematology analysers.

Name the conditions and the affecting indices and explain how to resolve the problem.

Question 2

[10 marks]

Clinical history

A 65-year-old woman with increasing tiredness, exertional dyspnoea (difficult breathing). She has been treated with oral iron without symptomatic improvement and she has lost 5kg recently. On examination, she was very pale. Laboratory findings and the peripheral blood film are shown below.

Laboratory findings

Haematology

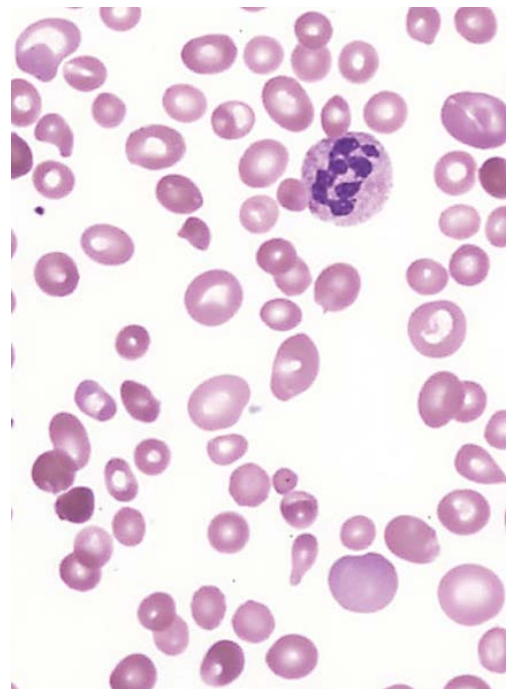
Test		Normal range	
WBC:	3.5	5.0-17.0	$\times 10^9/L$
RBC:	1.6	4.0-5.23	$\times 10^{12}/L$
Hb:	5.5	10.2-15.2	g/dL
HCT:	18	36-45	%
MCV:	112	78-94	fL
MCH:	34.4	23-31	pg
MCHC:	30.5	32-36	g/dL
RDW:	22	11.5-14.5	%
Plt:	48	150-450	$\times 10^9/L$

Biochemistry (serum)

Iron	110	60-170	$\mu\text{g}/\text{dL}$
TIBC	255	245-450	$\mu\text{g}/\text{dL}$
Folate	10	2-20	ng/mL

Immunoassay

Anti- gastric antibodies **Positive** Negative



Describe your findings and write a report while considering these questions:

1. What are the significant morphologic changes you see in blood film?
2. How these morphologic abnormality relates to the FBC indices and clinical symptoms?
3. What's the possible diagnosis and what other laboratory test you may suggest to help the accurate diagnosis?

Question 3

[10 marks]

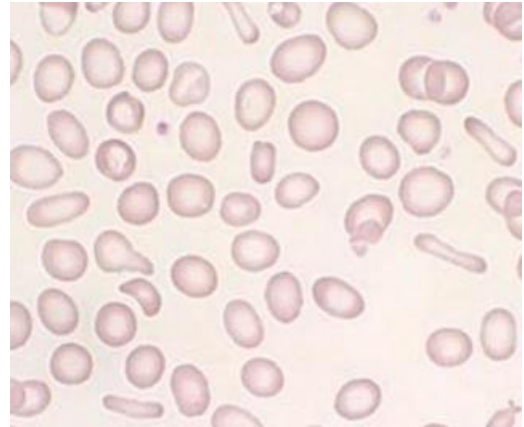
Clinical history

A 30 year old woman visits her primary healthcare provider complaining for being fatigue with recent short breath. She looks pale on physical examination and she does not smoke or drink. Full blood count results and peripheral blood film are shown bellow.

Laboratory findings

Haematology

Test		Normal range
WBC:	$5.3 \times 10^9/L$	$3.6-10.6 \times 10^9/L$
PMN: (Neut, Eos, Baso)	62%	
LYM:	30%	
Mon:	5%	
Myelocyte	3%	
RBC:	$3.1 \times 10^{12}/L$	$4.0-5.2 \times 10^{12}/L$
Hb:	7.0 g/dL	12-15 g/dL
HCT:	21.8 %	36-49 %
MCV:	70.3 fL	78-94 fL
MCH:	22.4 pg	23-31 pg
MCHC:	32.1g/dL	32-36 g/dL
RDW:	17%	11.5-14.5%
Plt:	$168 \times 10^9/L$	$150-450 \times 10^9/L$
ESR	47(mm/1 st hr)	0 to 20 mm/h



Biochemistry

Beta-hcG	150,000 mIU/ml	< 5 mIU/ml
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Describe your findings and write a report while considering these questions:

1. What are the significant morphologic changes you see in blood film?
2. How these morphologic abnormality relates to the FBC indices and clinical symptoms?
3. What is the possible diagnosis and what other laboratory test you may suggest to help the accurate diagnosis?

Question 4

[10 marks]

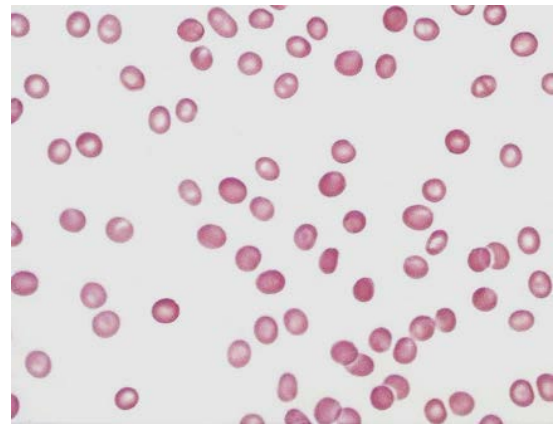
Clinical history

A 4-yr-old male with recurrent pneumonia, epistaxis and easy bruising brought the clinic for his generalised weakness. Physical examination of the patient revealed short abnormal thumb and multiple dark spots on the different parts of the body.
Calculate the RBC indices and fill the blanks in FBC results.

Report your findings based on the FBC result and the blood morphology shown below, and finalise your report with appropriate comments and possible diagnosis.

Laboratory findings

<u>Test</u>	<u>Normal range</u>		
WBC: 4.0	5.0-17.0		$\times 10^9/L$
Neut: 1.1	2.3-8.1		$\times 10^9/L$
LYM: 0.4	0.8-4.8		$\times 10^9/L$
RBC: 3.5	4.0-5.23		$\times 10^{12}/L$
Hb: 12.5	10.2-15.2		g/dL
HCT: 36	36-45		%
Retic: 0.3	0.5-1.5		%
MCV: ----	78-94		fL
MCH: ----	23-31		pg
MCHC: ----	32-36		g/dL
Plt: 78	150-450		$\times 10^9/L$



END OF SECTION B

You have completed the test. Please place the multiple choice questions answer sheet that you used for Section A inside the answer booklet. Please ensure that your name and student number are clearly indicated on your Answer Sheet and at the top of this examination paper.