

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

**Selection Examination for Enrolment to the in-service Training Programme
in Postgraduate Certificate in Basic Laboratory Sciences leading to the
Postgraduate Diploma in Histopathology, Clinical Haematology and Chemical
Pathology – October 2018**

Date: 1st October 2018

Time: 1.00 p.m. – 3.00 p.m.

ESSAY PAPER

Answer all questions.

Answer each question in a separate book.

All questions carry equal marks.

PART A
ANATOMICAL PATHOLOGY (GENERAL & SYSTEMIC)

1.
 - 1.1.
 - 1.1.1. Describe the aetiopathogenesis of pulmonary thromboembolism.
(30 marks)
 - 1.1.2. Outline possible morphological changes of lung, in pulmonary thromboembolism.
(15 marks)
 - 1.2. Describe the pathogenesis of oedema in congestive cardiac failure.
(25 marks)
 - 1.3. Explain the role of infectious agents in carcinogenesis, giving examples.
(30 marks)
2.
 - 2.1. A 50-year-old woman presented with a firm irregular lump in the upper outer quadrant of her right breast and peau d'orange appearance of the overlying skin. An eczematous rash is seen in the right nipple.
 - 2.1.1. List three (03) investigations helpful in the diagnosis of this breast mass.
(06 marks)

2.1.2. Describe the macroscopic and microscopic features you expect to see in this lesion. (20 marks)

2.1.3. Outline the pathogenesis of skin lesions (peau d'orange appearance and eczematous rash). (20 marks)

2.1.4. Her mother died of an ovarian cancer five years back.
What further tests would you recommend for this patient? (04 marks)

2.2. Describe the aetiopathogenesis of the following

2.2.1. Chronic gastritis (25 marks)

2.2.2. Liver abscess (25 marks)

3.

3.1. A 6-month-old baby presented with failure to thrive. On examination he was pale and had hepatosplenomegaly but no lymphadenopathy. His four year old brother is on regular blood transfusions.

Given below is his full blood count findings.

	Test Results	Reference range
RBC count	$2.9 \times 10^{12}/l$	$4.1-5.3 \times 10^{12}/l$
Hb	5.0 g/dL	11.1-14.1 g/dL
MCV	59 fl	70-84 fl
MCH	19 pg	24-30 pg
MCHC	25 g/dL	27-32 g/dL
WBC	$9.0 \times 10^9/l$	$6.0-18 \times 10^9/l$
Platelet count	$410 \times 10^9/l$	$200-450 \times 10^9/l$

3.1.1. Interpret the full blood count report. (10 marks)

3.1.2. What is the most likely diagnosis? (10 marks)

3.1.3. List three (03) investigations, describing expected results that will help to come to the above diagnosis mentioned in 3.1.2. (15 marks)

3.1.4. Outline the immediate and long-term management of this baby. (20 marks)

3.2. A 24- year-old woman presents with menorrhagia since menarche. Gynaecological causes for menorrhagia have been ruled out.

3.2.1. List five (05) first line tests that you would do to investigate a bleeding disorder in this woman. (10 marks)

3.2.2. If this patient has von Willebrand disease give the expected results of the above tests mentioned in 3.2.1. (10 marks)

3.2.3. List three (03) further investigations with the expected results that you would do to confirm a diagnosis of von Willebrand disease. (15 marks)

3.2.4. What are the therapeutic options available for a patient with von Willebrand disease. (10 marks)

4.

4.1. Outline causes of high serum amylase levels. Indicate how clinical history, examination findings and investigations would help in arriving at a diagnosis. (30 marks)

4.2. Describe how you would investigate a 17-year- old female who has a BMI (body mass index) of 17.5 kg/m² and a disturbed body image. (30 marks)

4.3. A 14-year-old boy was found semi-conscious while attending a scouting camp. He was dehydrated and had mild fever on admission. Following blood tests were performed at ETU.

Glucose	11	mmol/L	
Urea	5.6	mmol/L	(3.3-6.7)
Sodium	136	mmol/L	(135-145)
Potassium	5.6	mmol/L	(3.5 – 4.8)
Chloride	100	mmol/L	(96 – 106)
Bicarbonate	8	mmol/L	(23 – 32)
Creatinine	105	μmol/L	(60-120)
pH	6.9		
pCO ₂	40	mmHg	(35 – 45)

4.3.1. Describe the acid-base metabolism seen in this boy.

4.3.2. List possible causes of above findings.

4.3.3. Write down the investigations that you request further for narrowing the differential diagnosis.

(10 marks)

- 4.4. A 45-year-old female complained of increasing thirst and passing of copious amounts of urine over past three months. After performing few basic laboratory tests, she was admitted for water deprivation test. Results of water deprivation tests are given.

	Initial	After 6 hrs of water deprivation	
Weight	60	57	kg
Serum osmolality	296	306	mosmol/kg
Serum sodium	144		mmol/L
Urine osmolality	90	218	mosmol/kg

After 6 hours of water deprivation, she was allowed to drink and was given desmopressin. Following that her urine osmolality rose to 800 mosmol/kg.

4.4.1. Mention three basic laboratory tests that would have been performed before water deprivation test.

4.4.2. What is the diagnosis?

(10 marks)

- 4.5. A 45-year-old woman presented with a two month history of anorexia, fatigue with dizziness when rising from supine to standing posture and increased skin pigmentation. She had her menopause at 38 years and is on thyroxine 100 µg/day for five years. On examination: mildly dehydrated, pulse 96 /min and low volume, blood pressure 96/60 mmHg in supine and 70/40 mmHg on standing.

Laboratory investigations showed

Sodium	126	mmol/L	(135-145)
Potassium	5.9	mmol/L	(3.5-5.5)
Urea	11	mmol/L	(1.8-7.2)
Bicarbonate	18	mmol/L	(22-26)
Fasting glucose	3	mmol/L	(3.9-5.5)

4.5.1. What is the most likely diagnosis?

4.5.2. What is the investigation to confirm the diagnosis?

4.5.3. What is the most likely aetiopathogenesis for diagnosis given 4.5.1.
(10 marks)

4.6. A 69-year-old female with persistently elevated ESR over 90 mm/first hour and loss of body weight by 3.5 kg for last one year was investigated for a diagnosis. She had no other significant medical or surgical history prior to this development. Her biochemical investigations show following findings.

Blood			
Sodium	143	mmol/L	(135-145)
Potassium	3.8	mmol/L	(3.5 – 5.0)
ALT (SGPT)	60	IU/L	(22-40)
AST (SGPT)	54	IU/L	(20-38)
ALP	274	IU/L	(60-90)
Gamma-GT	108	IU/L	(20-56)
Total Bilirubin	15	µmol/L	(<17)
Creatinine	90	µmol/L	(70-160)

Serum Protein Electrophoresis: Hypergammaglobulinaemia with β - γ fusion.

Urine

Deposit Occasional pus cells/HPF
 1-2 RBC/HPF

4.6.1. What is the differential diagnosis?

4.6.2. Write two (02) other most important biochemical investigation that you would perform to arrive at a diagnosis.

(10 marks)