

**POSTGRADUATE INSTITUTE OF MEDICINE**  
**UNIVERSITY OF COLOMBO**

**SELECTION EXAMINATION LEADING TO MD IN**  
**HISTOPATHOLOGY, CLINICAL HAEMATOLOGY AND**  
**CHEMICAL PATHOLOGY - DECEMBER 2021**

**Date:-** 22<sup>nd</sup> December 2021

**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. Describe the pathogenetic basis of the following:

- 1.1. Cardinal features of acute inflammation. (30 marks)
- 1.2. Squamous intraepithelial neoplasia in the uterine cervix following Human papillomavirus (HPV) infection. (40 marks)
- 1.3. Amyloidosis in chronic inflammation. (30 marks)

2.

2.1. A 65-year-old man with a history of hypertension had severe headache and presented with altered level of consciousness. His MRI showed a large space occupying lesion in the left frontal lobe.

2.1.1. List three (03) likely causes for this lesion. (12 marks)

2.1.2. Describe the macroscopic features of one (01) of the lesions mentioned in 2.1.1. (10 marks)

2.1.3. Describe the expected macroscopic features in the rest of the brain in this patient. (18 marks)

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2.2.

2.2.1. List three (03) neoplastic polyps and three (03) non-neoplastic polyps that arise in the colon. (12 marks)

2.2.2. Briefly describe the microscopic features of one (01) neoplastic polyp and one (01) non-neoplastic polyp you mentioned in 2.2.1. (18 marks)

2.3. A 38-year-old woman who had normal menstrual cycles previously, developed heavy per vaginal bleeding of recent onset.

2.3.1. List three (03) possible pathological lesions that could cause her symptoms. (12 marks)

2.3.2. Describe the macroscopic and microscopic features of one (01) of the lesions you mentioned in 2.3.1. (18 marks)

### PART B HAEMATOLOGY

3.

3.1. A 60-year-old woman is on treatment for hypothyroidism and is currently euthyroid. She presents with progressively worsening fatiguability and shortness of breath over a period of two months and appears pale on examination.

Her full blood count (FBC) is given below.

Hb	7.0 g/dL	(13.5-16.5)
HCT	21%	(35-45)
MCV	105 fL	(80-95)
MCH	30 pg	(27-32)
MCHC	33g/dL	(32-34)
WBC	$2.0 \times 10^9/L$	(4-11)
Neutrophils	30%	
Lymphocytes	50%	
Platelet count	$60 \times 10^9/L$	(150-400)

3.1.1. Interpret the FBC. (05 marks)

3.1.2. List four (04) possible causes for the above results. (10 marks)

3.1.3. What information would you obtain in the history relevant to the causes listed in 3.1.2.? (10 marks)

- 3.1.4. What further investigations would you do to arrive at a diagnosis, giving reasons for each. (25 marks)
- 3.1.5 Outline the principles of managing one (01) of the causes mentioned in 3.1.2 (10 marks)
- 3.2. After the above patient was lost to follow up, she now presents with acute pain and swelling of the left leg which is suspected to be due to deep vein thrombosis (DVT). Her FBC remains similar to that at the first presentation.
- 3.2.1. How would you confirm the lower limb DVT? (05 marks)
- 3.2.2. List five (05) possible causes for the venous thrombosis in this patient. (15 marks)
- 3.2.3. What are the principles of managing DVT in this patient? (20 marks)

**PART C**  
**CHEMICAL PATHOLOGY**

4.

- 4.1. Give a brief account on the clinical usefulness of measuring serum ferritin. (50 marks)
- 4.2. A 34-year-old man with diabetes mellitus was brought to the accident service following a run-over injury. He was resuscitated and started on intravenous gentamicin and ceftriaxone. He developed brownish discolouration of urine on day 1 post admission.

Following were his investigations.

Urine

Pus cells	5-10/hpf
Red blood cells	2-3/hpf
Urobilinogen	Present in normal amounts

Serum

Creatinine	138 $\mu\text{mol/L}$	(60-115)
Creatine kinase	2556 U/L	(22-198)

Whole Blood

Haemoglobin	11 g/dL	(12-16)
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- 4.2.1. What is the most likely cause for the discolouration of his urine? (02 marks)

He developed high fever of 39°C. His wound and blood culture reports are pending.

4.2.2. List two (02) biochemical tests in serum that you recommend to support the diagnosis of a bacterial infection. (02 marks)

His urine output on day 7 was 212 mL/24 hours.

Further investigations on day 7 are given below:

Serum creatinine	578	μmol/L	(60-115)
Hb	8.2	g/dL	
WBC	23	x 10 <sup>9</sup> /L	(4-11)
Platelet count	323	x 10 <sup>9</sup> /L	(150-400)

4.2.3. List three (03) possible causes for his renal pathology. (03 marks)

4.2.4. Explain the reason why the estimated glomerular filtration rate (eGFR) is not reliable in this patient. (02 marks)

4.2.5. State one (01) clinical and one (01) biochemical indication for dialysis in this patient. (02 marks)

A junior medical officer requested an HbA1c level.

4.2.6. State the sample collection container for this test giving reasons. (02 marks)

4.2.7. Comment on the appropriateness of this request. (02 marks)

4.3. A 26-year-old woman was evaluated for secondary amenorrhoea of several months.

The patient was hirsute and had mild acne.

4.3.1. What is the commonest cause for secondary amenorrhoea in her age group? (01 mark)

Her serum investigations taken at 9.00 a.m. are given below:

Testosterone	4.3	nmol/L	(0.42 - 2.05)
Follicle-stimulating hormone (FSH)	5.9	U/L	(3.3 -6.06)
Luteinizing hormone (LH)	11.0	U/L	(4.8 -10.73)
17-OH progesterone	2.8	nmol/L	(< 4.4)
Dehydroepiandrosterone sulfate (DHEAS)	3.2	ng/mL	(1.12-7.43)
Cortisol	500	nmol/L	(140-690)
Growth hormone	6	ng/mL	(< 10)
Prolactin	12	ng/mL	(< 25)

4.3.2. State the reason why the sample is obtained at 9.00 a.m. (03 marks)

4.3.3. Interpret her DHEAS and 17-OH progesterone results. (03 marks)

4.3.4. What is the most likely diagnosis in this patient? (02 marks)

4.3.5. List two (02) biochemical tests that are indicated for the management of this patient once the diagnosis you mentioned in 4.3.4 is confirmed. (04 marks)

4.3.6. List two (02) malignancies that have a higher incidence in this condition. (02 marks)

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4.4. State the most appropriate **biochemical** investigation in the following clinical conditions.

4.4.1. For screening of a 40-year-old man whose blood pressure is not controlled with 3 anti-hypertensive drugs. He has hypokalaemia. (03 marks)

4.4.2. To diagnose a 70-year-old man with recent onset backache, renal insufficiency and anaemia. (03 marks)

4.4.3. To initiate management in a 12-year-old boy who presented with recurrent vomiting. He was afebrile. His investigations revealed hyponatraemia, hyperkalaemia and mild neutrophil leucocytosis. His plasma glucose was 4 mmol/L. (03 marks)

4.4.4. To diagnose a 3-year-old boy with short stature with the following results. (03 marks)

Serum

Calcium (albumin corrected)	1.8 mmol/L	(2.2-2.5)
Phosphate	2.1 mmol/L	(1.45 -1.78)

4.4.5. To diagnose a 50-year-old man with prognathism and high plasma glucose. (03 marks)