

CHUKA

UNIVERSITY



UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN BIOCHEMISTRY

BIOC 417: MEDICAL BIOCHEMISTRY II

STREAMS: BSC. BIOC

TIME: 2 HOURS

DAY/DATE: MONDAY 14/04/2025

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS

- Answer Question ONE and any other TWO questions
- Do not write on the question paper

QUESTION ONE: (30 Marks)

a. Define the following disease conditions indicating the cause for each.

(i) Alkaptonuria

(ii) Pyogenic meningitis

[2x2 marks]

b. A 60-year-old, obese man with frequent urination is seen by his primary care physician. The following laboratory work was performed and results tabulated below:

Analysis	Observations
Colour and appearance	Pale/clear
pH	6.0
Casual plasma glucose	12.5 mmol/L
Blood	negative
bilirubin	negative
urobilinogen	negative
ketones	moderate
Testosterone	<4.0 nmol/L

i. What is the probable diagnosis of this patient?

[2 marks]

- ii. What further tests might be performed to confirm the diagnosis? [3 marks]
- iii. After diagnosis, what test(s) should be performed to monitor his condition? [3 marks]
- iv. Describe three methods used to determine glucose concentration in a clinical specimen. [6 marks]
- c. Citing examples, explain the precautions necessary for selecting and collecting a specimen properly and carefully for clinical biochemistry examination. [3 marks]
- d. Describe the clinical relevance of Lipoprotein(a) in management of cardiovascular diseases. [4 marks]
- e. Outline the clinical procedure used to collect 24-hour urine for diagnostic purposes. [5 marks]

QUESTION TWO: (20 Marks)

- (a) Discuss the biochemical basis and pathophysiology of sickle cell anaemia. [12 marks]
- (b) Describe factors that affect the laboratory normal reference ranges [8 marks]

QUESTION THREE: (20 Marks)

- (a) Explain the analytical methods for urea determination in a clinical biochemistry laboratory. [10 marks]
- (b) Under what conditions are serum levels of uric acid elevated in human? [10 marks]

QUESTION FOUR: (20 Marks)

- (a) Describe laboratory methods used to measure the detoxification function of liver. [10 marks]
- (b) Discuss the diagnostic significance of Lactate dehydrogenase (LDH) isoenzymes. [10 marks]

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