"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS DEGREE

NSLS403: CHEMICAL PATHOLOGY

END OF FIRST SEMESTER FINAL EXAMINATIONS

NOV 2021

LECTURER: MR G. MALUNGA

15 NOVEMBER 2021

DURATION: 5 HOURS

INSTRUCTIONS

1. Write your candidate number on your answer sheets.
2. Answer any **ONE** question of your choice.
3. Each full question carries 100 marks
4. Submit your answer scripts as PDF documents through Moodle ONLY.
5. Use the following specifications in your answer scripts:
   Font: Times New Roman
   Font size: 12
   Line spacing: 2.0
6. Credit will be given for logical, systematic and neat presentations.

Answer any ONE question

Question 1

Mary telephoned for an ambulance when she was unable to rouse her husband, John one morning. She noticed that his left leg and arm were jerking. In the hospital emergency room, he was seen to be pale and sweaty, with a rapid pulse. His blood glucose concentration was 0.8 mmol/L. He regained consciousness when given glucose intravenously, but then became confused and required a continuous glucose infusion for several hours to keep him alert. When he became fully conscious, blood samples were taken for analysis and the results obtained are shown in Table 1.

Table 1: Laboratory serum results for John

Test	Result	Reference Ranges
Glucose	1.5 mmol/l	3.9 - 5.6
Insulin	480 pmol/l	<20
C-peptide	2200 pmol/l	<100
ß hydroxybutyrate	0.06 mmol/l	0 - 0.2
LDH	250 U/l	60 - 200
GGT	310 U/l	0 - 50
ALT	30 U/l	1 - 41
AST	22 U/l	0 - 40
ALP	600 U/l	30 -120

Laparotomy was done and the liver was found to have extensive tumour deposits. A single small tumour was present in the pancreas and no operative treatment was possible.

a) Explain all the results in relation to the symptoms presented by the patient. [25]

b) Explain the value of the C-peptide analysis in establishing the diagnosis of this patient? [15]

c) Why was ß-hydroxybutyrate low in this case? [10]

d) Why was ALP and GGT disproportionately increased? [20]

e) State and explain other laboratory tests which can be done to come up with a proper diagnosis for this patient. [30]

Question 2

Discuss the clinical utility of the laboratory measurement of the following plasma proteins.

a) C-reactive protein [30]

b) Albumin [40]

c) Immunoglobulins [30]

Question 3

a) Discuss in detail the regulation of Calcium and Magnesium in the body. [50]
b) Give an analysis of the laboratory results associated with different thyroid disorders. [50]

The End