"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 SEMESTER FINAL EXAMINATIONS

LECTURER: MR G. MALUNGA

3 MAY 2021 0900 hrs

DURATION: 7 HOURS

INSTRUCTIONS

1. Write your candidate number on your answer sheets.
2. Answer any **one** question of your choice.
3. Marks for each question are indicated in brackets at the end of the question.
4. Each full question carries 100 marks
5. Submit your answer script as a PDF.
6. Use the following specifications in your answer scripts:
   Font: Times New Roman
   Font size: 12
   Line spacing: 2.0
7. Credit will be given for logical, systematic and neat presentations.

Answer any ONE question

Question 1

A 60-year old female presented to an outpatient department at Parirenyatwa Hospital with the following symptoms: tiredness and weakness developing over a long period of time. Several years previously she had developed backache due to a car accident and had habitually consumed large quantities of paracetamol tablets. Blood and urine samples were collected for laboratory analysis and the results were as follows.

Serum results

Test	Result	Reference Ranges
Na^+	140 mmol/l	135-145
K^+	5.5 mmol/	3.5-5.0
Urea	25 mmol/l	1.7-6.7
Creatinine	810 µmol/ l	50-100
HCO_3^-	16 mmol/l	22 - 29
Albumin	40 g/l	35-50
Calcium	1.9 mmol/l	2.1 – 2.6
P_i	4.2 mmol/l	0.8 – 1.4
Urate	0.57 mmol/l	0.12 – 0.5

Urine results

Test	Result
Na^+	50 mmol/l
K^+	30 mmol/l
Urea	120 mmol/l
Creatinine	4.0 mmol/l (4000 µmoles/l)
Osmol.	330 mosm/kg
Urine output:	3 litres/24h

a) Calculate the creatinine clearance and comment on its value (Reference ranges for females is 85 - 125 ml/min). **[5]**

b) Give a detailed explanation of all the biochemical findings**. [30]**

c) Suggest the most probable diagnosis of this patient and support your answer. **[20]**

d) Explain the other diagnostic laboratory tests which can be carried out to have a definite diagnosis. **[10]**

e) Calculate the daily sodium output. What could happen if her sodium intake fell substantially below this value? **[10]**

f) Comment on the plasma K^+. Is it important to monitor this regularly? **[10]**

g) Discuss the main approaches to clinical management of this patient. **[15]**

Question 2

a) Discuss the long term complications of diabetes mellitus **[50]**

b) Give a detailed analysis of the biochemical features of jaundice **[50]**

Question 3

Elaborate the pathophysiology and clinical features of the following inborn errors of metabolism

a) Galactosemia **[25]**

b) Phenylketonuria **[25]**

c) Lesch-Nyhan Syndrome **[25]**

d) Type 1 Diabetes Mellitus **[25]**

The End