



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES**

**DEPARTMENT OF HEALTH SCIENCES**

<b>QUALIFICATION:</b> BACHELOR OF MEDICAL LABORATORY SCIENCES	
<b>QUALIFICATION CODE:</b> 08BMLS	<b>LEVEL:</b> 6
<b>COURSE CODE:</b> CLC621S	<b>COURSE NAME:</b> CLINICAL CHEMISTRY 2B
<b>SESSION:</b> JANUARY 2023	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

**SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION**

<b>EXAMINER(S)</b>	MR NOEL RUKANDA
<b>MODERATOR:</b>	DR MAURICE NYAMBUYA

**INSTRUCTIONS**

1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

**PERMISSIBLE MATERIALS**

1. NON PROGRAMMABLE CALCULATOR

**THIS QUESTION PAPER CONSISTS OF FOUR PAGES (Including this front page)**

SECTION A [35]

**Question 1**

[19]

1. Which of the following electrolytes is responsible for the functions listed? Please note that more than one electrolyte may be responsible.

Ca, K, HCO<sub>3</sub>, Cl, Mg, Zn, Na

**Function**

1.1 Neuromuscular excitability	4
1.2 Regulate ion pumps	1
1.3 Blood volume osmolality	3
1.4 Enzyme cofactors	3
1.5 Acid base balance	3
1.6 Heart rhythm and contractility	3
1.7 Blood coagulation	2

**Question 2**

[16]

2. Answer the questions below. Only write the question number and the corresponding answers

2.1 Identify the <b>TWO</b> electrolytes which are excreted when sodium is reabsorbed at the tubules.	2
2.2 State the method used to analyse the most electrolytes.	1
2.3 What is the preferred anticoagulant for arterial blood gas collection?	1
2.4 Name <b>TWO</b> electrodes used for measurement of blood gases.	2
2.5 Deduce the type of anemia associated with the following: low total iron, normal ferritin, low TIBC, Low % saturation and low transferrin.	1
2.6 A patient has a transferrin of 2.25g/L, enumerate the Total Iron Binding Capacity.	1
2.7 Identify the element transported by ceruloplasmin	1
2.8 State <b>TWO</b> main components of serum proteins.	2
2.9 How much urea is passively reabsorbed in the kidneys?	1
2.10 Which test is commonly used as an indicator of Glomerular Filtration rate?	1
2.11 Identify the enzyme reaction whose rate depends on enzyme concentration.	1

2.12 Name the lipoprotein which is strongly associated with family history of heart disease.

1

2.13 Name the hormone responsible for lowering blood glucose.

1

**SECTION B: [25]**

**Question 3**

**[15]**

SERUM/PLASMA	CONCENTRATION	REFERENCE RANGE
SODIUM	107	136-146mmol/l
POTASSIUM	7.7	3.0-5.5mmol/l
CHLORIDE	107	90-110mmol/l
CO <sub>2</sub>	22	20-30mmol/l
Urea	2.9	2.9-8.3mmol/l
Creatinine	45	90-115ummol/L
Glucose	6.3	3.5-5.5mmol/l
Total Protein	66	65.-80mmol/l
Albumin	28	35-50mmol/l
Osmolality	280	mOsm/kg

3.1 Comment on the patient's osmolal gap

5

3.2 The patient sample was processed 30hours from collection. Explain the K<sup>+</sup> results.

5

3.3 Briefly explain how the patient respond to low Na<sup>+</sup> levels.

5

**Question 4**

**[10]**

4.1 Indicate 5 causes of Metabolic acidosis

5

4.2 Respiratory acidosis

5

**SECTION C [40 marks]**

**Question 5**

**[15]**

Compare and contrast diabetes insipidus and diabetes mellitus. Please tabulate your answer.

**Question 6**

**[15]**

Describe the breakdown of red blood cells in the body giving particular attention to the fate of the different molecules made during the metabolic process.

**Question 7**

**[10]**

Describe 5 tests used in management of diabetic patients. Indicate the clinical significance of each test.

**END OF PAPER**

**Total Marks 100**