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FACULTY OF ALLIED HEALTH SCIENCES, UNIVERSITY OF RUHUNA
Department of Medical Laboratory Science
Sixth End Semester Examination- December 2025, 2020/2021 Batch
Clinical Biochemistry II (MLS 3223) – SEQ

Date: 10.12.2025 Time: 8.30 a.m.-9.15 a.m. Duration: 45 minutes

Answer all questions **Index Number:** .....

1.

1.1 List **four** Metabolic bone disorders. (20marks)

1.2 State **three** main sites that participate in regulating calcium metabolism. (30 marks)

1.3 Briefly describe the effect of vitamin D on serum calcium and phosphorous levels. (20 marks)

1.4 Briefly discuss the effect of Parathyroid hormone (PTH) on kidney, bone and gastro intestinal tract (GIT) in relation to serum calcium and phosphate levels. (30 marks)

2.

2.1 Define the term "resolution" in chromatography. (15 marks)

2.2 List **three** approaches to improve resolution in chromatography. (25 marks)

2.3 Describe the principle of size-exclusion chromatography. (30 marks)

2.4 Discuss the use of internal standards in chromatographic analysis. (30 marks)

3.

3.1 Define the term "Colligative Properties". (10 marks)

3.2 Briefly describe the principle behind the Freezing point depression analyzer for measuring osmolality. (25 marks)

3.3 Normal plasma freezes at - 0.53 °C. Considering that 1 mole of dissolved molecules per kg depresses the freezing point of water by 1.86 °C, calculate normal plasma osmolality. (15 marks)

3.4 The results of a few biochemical investigations of a 52-year-old male admitted to the emergency treatment unit following a road traffic accident are given below.
Calculate his plasma osmolality. (20 marks)

Parameter	Result	Reference range
Sodium (Na^+)	135 mmol/L	135 – 145 mmol/L
Random plasma glucose	100 mg/dL	<200 mg/dL
Serum creatinine	0.8 mg/dL	0.6 – 1.1 mg/dL
Blood Urea Nitrogen (BUN)	15 mg/dL	6 – 20 mg/dL

3.5 If the measured osmolality of the patient is 383 mOsm/kg, comment on the osmolal gap giving reasons. (30 marks)

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