UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
SECOND YEAR SECOND SEMESTER EXAMINATION IN BSc. HONS (MLS)-2022
MLSCB 2235 CLINICAL BIOCHEMISTRY I
PAPER II

Date: 28.06.2024 **Time: 2 Hours**

ANSWER ALL SIX QUESTIONS
ANSWER EACH QUESTION IN SEPARATE ANSWER BOOKS

1. The Urine Full Report of a known diabetic patient on his routine check-up is given below.

Colour	: Pale yellow	White cells	: 100/ hpf
Clarity	: Turbid	Red cells	: 1-2/ hpf
Specific gravity	: 1.035	Epithelial cells	: Few
pH	: 6.5	Casts	: White cell cast +, fatty cast +
Protein	: +++	Organisms	: Few
Glucose	: +		
Ketone bodies	: Negative		
Urobilinogen	: Normal		

1.1 Identify the abnormal findings in the given report. (20 Marks)

1.2 Briefly explain how to handle and store urine reagent strips. (30 Marks)

1.3 List **four (04)** risk factors for forming urinary casts. (10 Marks)

1.4 Write a brief note on the factors that need to be standardized for urine microscopy. (40 Marks)

2.

2.1 A 40-year-old man was admitted to the Accident & Emergency (A&E) department. He is a known Diabetes Mellitus (DM) patient for the last 10 years. On admission, his random plasma glucose was 22.2 mmol/L.

2.1.1 List **five (05)** other blood investigations with expected findings. (20 Marks)

2.1.2 Mention **two (02)** blood investigations that can be done for long-term monitoring of diabetes. (10 Marks)

2.2 While continuing the medications at home, he was found unconscious & admitted to the A&E again. On admission, his capillary blood glucose was 2.1mmol/L.

2.2.1 Name the probable condition in this patient. (05 Marks)

2.2.2 List **five (05)** causes for the condition mentioned in 2.2.1 (15 Marks)

2.2.3 Mention **four (04)** other biochemical tests that can be done in this patient. (20 Marks)

2.3 Write short notes on urinary microalbumin measurement. (30 Marks)

3. A 40-year-old obese woman presented with unbearable abdominal pain to the emergency unit. on examination, she had yellowish discolouration of skin and sclera. Ultrasound scan of the abdomen revealed the presence of gallstones.

3.1 Name **two (02)** main types of gall stones and mention **one (01)** main composition of each kind of stone. (15 Marks)

3.2 Name **three (03)** laboratory methods available for the analysis of the compositions of gallstones in the clinical laboratory (10 Marks)

3.3 Mention the probable type of jaundice she has at present (05 Marks)

3.4 List **five (05)** laboratory investigations with their expected findings to confirm the type of jaundice in this patient. (30 Marks)

3.5 Mention the other **two (02)** types of jaundice and **five (05)** laboratory tests each with expected findings to confirm the condition. (40 Marks)

4. Briefly explain the patient preparation, special precautions to be taken when collecting the sample, sample type, and sample container for the following tests. (No need to include detailed phlebotomy procedure)

4.1 Lipid Profile (40 Marks)

4.2 Serum iron (30 Marks)

4.3 Urine porphobilinogen (30 Marks)

5. A 65-year-old man was referred to the nephrology clinic. Previously his left leg was amputated due to chronic infection. His estimated glomerular filtration rate (eGFR) was 35 ml/min/1.73m^2. (Reference range >90 mL/min/1.73 m^2).

5.1 Comment on the above eGFR result (10 Marks)

5.2 A 24-hour urine collection was requested for creatine clearance. Briefly explain the procedure of 24- hour urine collection (30 Marks)

5.3 Name **one (01)** chemical preservative which can be added to the 24-hour urine collection container for creatinine clearance (05 Marks)

5.4 Mention the properties of an ideal clearance marker and discuss how creatinine satisfies and deviates from the properties. (35 Marks)

5.5 Name **one (01)** method used in the routine clinical laboratory to measure serum creatinine and briefly explain the principle of the method. (20 Marks)

6.

6.1 Albumin and globulins are the major types of plasma proteins.

6.1.1 List **four (04)** methods available for the separation of plasma proteins. (10 Marks)

6.1.2 Briefly discuss the importance of measuring any **four (04)** types of plasma proteins in clinical samples. (40 Marks)

6.2 A 70-year-old man with depression and weakness was admitted to the Emergency Unit. Serum electrolytes test was requested to be performed.

6.2.1 Mention **five (05)** methods available to measure serum electrolytes in clinical laboratories. (20 Marks)

6.2.2 Briefly explain the precautions that should be taken for the collection and handling of blood samples for serum electrolyte measurement. (30 Marks)