UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
THIRD YEAR FIRST SEMESTER EXAMINATION IN BScHons (MLS)-2023
MLSCB 3126 CLINICAL BIOCHEMISTRY II
PAPER II

Date: 02.12.2024 Time: 2 Hours

ANSWER ALL THE QUESTIONS
ANSWER EACH QUESTION IN SEPARATE ANSWER BOOKS

1. A 35-year-old woman was suspected to have malabsorption due to coeliac disease.

1.1

1.1.1 List **four (04)** causes of malabsorption other than coeliac disease. (10 Marks)

1.1.2 List **four (04)** investigations that can be done in a patient with coeliac disease. (20 Marks)

1.1.3 Mention **two (02)** micronutrient deficiencies that can occur in malabsorption. (10 Marks)

1.2

1.2.1 Briefly explain the patient preparation, sample collection procedure, collection container, and the principle of the test method used to identify occult blood in stool by immunochemical method. (40 Marks)

1.2.2 Outline **two (02)** causes each for false positive and false negative results that can occur in the test mentioned in 1.2.1. (20 Marks)

2.

2.1

2.1.1 Briefly explain the role of tumor markers in cancer patients. (30 Marks)

2.1.2 Name **four (04)** tumor markers routinely analyzed in clinical laboratories and mention **two (02)** malignant conditions each associated with each tumour marker. (20 Marks)

2.2 Briefly explain the possibilities that can affect immunoassays in the following scenarios (Exclude the common interferences like lipaemia, haemolysis & icteric).

2.2.1 A 45-year-old man presents with central obesity, moon face, hypertension, and muscle weakness suggestive of Cushing syndrome. On investigation, 9. 00 am cortisol result was 245 nmol/L (25 Marks)

2.2.2 Routine blood tests of a 16-year-old girl reveal serum prolactin value of 120 ng/mL (reference interval= 3.8-23 ng/mL). Clinical symptoms are not suggestive of true hyperprolactinaemia. (25 Marks)

3. A 65-year-old man presented with polyuria, constipation, and bone pain for 2 months duration. His serum-corrected calcium was 3.15 mmol/L (The reference interval- 2.25 – 2.60 mmol/L).

3.1 List **five (05)** causes of hypercalcemia. (10 Marks)

3.2 Mention **four (04)** laboratory investigations with expected findings that are used to differentiate the causes mentioned in 3.1. (20 Marks)

3.3 List the precautions, patient preparation, sample type, collection tube, and transport of sample for the hormone test mentioned in 3.2. (25 Marks)

3.4 Name **two (02)** routine laboratory methods used to measure serum total calcium. (05 Marks)

3.5 Briefly discuss the advantages and drawbacks of using serum total calcium measurement over free calcium measurement. (40 Marks)

4.

4.1 After 2 years of marriage, a young couple came to a subfertility clinic to investigate their inability to conceive.

4.1.1 List **four (04)** causes each for male and female subfertility. (20 Marks)

4.1.2 After investigations, the couple was advised to undergo invitro fertilization and the female partner got pregnant upon successful treatment. **Name** the hormone that is used to diagnose early pregnancy and discuss the other clinical significance of measuring that hormone. (20 Marks)

4.2 Briefly discuss the possible preanalytical and analytical errors that affect the results of the following investigations.

4.2.1 Seminal fluid analysis (40 Marks)

4.2.2 Cerebrospinal fluid (CSF) glucose (20 Marks)

5. You are placed in a peripheral unit in a remote area as a first appointment Medica Laboratory Technologist (MLT). When you reach the laboratory on your 1st day of work, you realize that there is an automated clinical chemistry analyzer and a Direct ISE for the Chemical Pathology section. The preceding MLT was on Maternity leave for the last 2 months and all samples were transported to the nearby District hospital. When you open the refrigerator in the stores, there aren't any internal or external quality controls available. When inquired, no quality control was used in this laboratory except once in a while checking patient samples with another laboratory. You are going to make sure the analyzers were in working condition after servicing and getting new reagents.

5.1 Explain briefly, how you will establish a proper commercial internal quality control system. (30 Marks)

5.2 Explain briefly the features that you will expect in purchasing an internal quality control and list the advantages of doing so for each feature. (30 Marks)

5.3 List the pipettes that can be used for reconstituting lyophilized quality control and name the most important thing that has to be done periodically to these pipettes. (10 Marks)

5.4 How can the storage of quality controls and personnel, impact the internal quality control system? (10 Marks)

5.5 Explain what is third-party quality control and give the advantages of using it in the laboratory. (20 Marks)

6. A 40-year-old man presented to the Accident and Emergency with sudden onset palpitations, tremor of 3 hours duration. On examination his pulse rate was 120 / minute, Blood pressure was 200/160 mmHg and phaeochromocytoma was suspected.

6.1 List all the possible laboratory investigations that can be done to diagnose phaeochemocytoma and include patient preparation, sample type, sample container used for collection, any special precautions taken during sample collection, and transport to laboratory. (100 Marks)