

UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
FIRST YEAR SECOND SEMESTER EXAMINATION IN BScHons(MLS)-2020



**MLSCB 1275 CLINICAL BIOCHEMISTRY I
PAPER II**

Date: 06.09.2022

Time: 2 hours

ANSWER PART A AND PART B IN SEPARATE ANSWER BOOKS

PART A

1. A 15-year-old boy presented with fever, headache and neck stiffness of three days duration. Pyogenic bacterial meningitis was suspected and CSF analysis was performed.
 - 1.1 List Two (02) indications for performing CSF analysis other than meningitis. (10 Marks)
 - 1.2 Mention the tubes in the order to collect the CSF specimen for CSF full report. (20 Marks)
 - 1.3 Indicate the storage conditions for each of the tubes mentioned in 1.2, if immediate processing is not possible. (20 Marks)
 - 1.4 List Four (04) causes of xanthochromia in a CSF sample. (20 Marks)
 - 1.5 Tabulate the laboratory findings of the following parameters in CSF to differentiate bacterial and viral meningitis.
 - 1.5.1 Prominent leucocyte (10 Marks)
 - 1.5.2 Level of CSF protein (10 Marks)
 - 1.5.3 Level of CSF glucose (10 Marks)

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

Colour	: Pale yellow	Pus cells	: 6-8/ hpf
Clarity	: Turbid	Red cells	: 1-2/ hpf
Specific gravity	: 1.025	Epithelial cells	: Few
pH	: 6.5	Casts	: Granular cast +
Albumin	: ++	Organisms	: Nil
Glucose	: ++	Ketone bodies	: Trace
Urobilinogen	: Normal		

- 2.1 Identify the abnormal findings on the above report. **(20 Marks)**
- 2.2 Mention one manual chemical method and its principle for the following substances in urine.
- 2.2.1 Reducing sugars. **(10 Marks)**
- 2.2.2 Ketone bodies **(10 Marks)**
- 2.2.3 Albumin **(10 Marks)**
- 2.3 Briefly explain how the urine reagent strips are preserved/ stored. **(20 Marks)**
- 2.4 Mention **Two (02)** advantages and limitations of using reagent strips for urine analysis. **(10 Marks)**
- 2.5 Mention **Two (02)** crystals which can be seen in normal acidic urine. **(10 Marks)**
- 2.6 Give the changes that would occur in white cells (WBC) and red cells (RBC) in hypertonic urine. **(10 Marks)**



3. A 42-year-old lady had fasting plasma glucose (FPG) of 6.2 and 6.5 mmol/L on two occasions, and had polyuria and weight loss.

3.1 Write the criteria to confirm the diagnosis of diabetes mellitus in this patient. (20 Marks)

3.2 Give the term that used to describe the FPG levels of this patient. (10 Marks)

3.3 What probable test that could be carried out to confirm her condition. (10 Marks)

3.4 Explain the preparation of the patient and how the test is performed for the test mentioned in 3.3. (40 Marks)

3.5 Give the principle of a specific method which used to measure the plasma glucose level (20 Marks)

4. A 07-year-old boy was admitted to hospital with the symptoms of abdominal pain and diarrhoea. Stool examination was requested.

4.1 List **Four (04)** indications for performing stool examination. (20 Marks)

4.2 Give the principle of the Guaiac test method which is used to analyze the fecal occult blood and explain how you will perform the test procedure. (40 Marks)

4.3 How the patients should be instructed to collect the stool sample for the test mentioned in 4.2. (20 Marks)

4.4 Mention **Two (02)** possible interferences that can lead to false results in the test method mentioned in 4.2. (10 Marks)

4.5 List **Two (02)** other methods that are available in the clinical laboratory to identify the faecal occult blood. (10 Marks)

5. 5.1 List the **Two (02)** Major types of plasma proteins. (05 Marks)
- 5.2 List **Four (04)** methods that are available for the separation of Plasma proteins. (20 Marks)
- 5.3 Briefly explain the clinical importance of albumin in the human body (25 Marks)
- 5.4 Give the principle of Biuret method which used for the measurement of plasma total protein. (20 Marks)
- 5.5 List **Two (02)** methods available for the measurement of plasma total protein other than the method mentioned in 5.3. (10 Marks)
- 5.6 Briefly explain the electrophoretic pattern of plasma proteins of a patient with multiple myeloma using diagram and compare with that to normal person. (20 Marks)

PART B

6. 6.1 A 50-Year-old man, admitted to the hospital was suspected to have pheochromocytoma
- 6.1.1 List the biochemical parameters that should be analyzed to confirm the diagnosis. (20 Marks)
- 6.1.2 Give the biochemical basis of elevation of the parameters mentioned in 6.1.1. (40 Marks)
- 6.2 Describe the factors that should be considered during the selection and preparation of a buffer solution. (40 Marks)
7. 7.1 Explain the working principles of Hydrophobic interaction chromatography. (40 Marks)
- 7.2 Explain how the paper chromatography is carried out to separate amino acids. (60 Marks)
8. 8.1 Explain how Agarose Gel Electrophoresis is performed to separate DNA fragments (80 Marks)
- 8.2 Briefly explain the importance of using Ethidium Bromide in Agarose Gel Electrophoresis. (20 Marks)