UNIVERSITY OF JAFFNA

BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION-APRIL 2019

MLSCB 1275 CLINICAL BIOCHEMISTRY- I

Part II

Date: 08.04.2019 **Time: 2 Hours**

Answer all EIGHT questions.

Marks allotted to each part are indicated in Brackets.

Answer Each Question in Separate Answer Book.

1. 1.1 Explain how the polyacrylamide gel electrophoresis is performed to determine the purity of a protein separated by hydrophobic interaction chromatography. **(80 Marks)**

   1.2 Explain how the molecular weight of the purified proteins can by determined by polyacrylamide gel electrophoresis. **(20 Marks)**

2. 2.1 Give the principle of affinity chromatography. **(25 Marks)**

   2.2 Write note on the following on the basis of affinity chromatography.

   2.2.1 Matrix **(15 Marks)**

   2.2.2 Ligand **(20 Marks)**

   2.2.3 Spacer arm **(10 Marks)**

   2.3 Give the applications of affinity chromatography **(30 Marks)**

3. 3.1 Give the principle and applications of Capillary gel electrophoresis. **(45 Marks)**

   3.2 Give the principle of hydrophobic interaction chromatography. **(30 Marks)**

   3.3 Applications of Gas chromatogram-mass spectrometry (GC-MS). **(25 Marks)**

4. 4.1 A 30 year old woman was admitted to the hospital with the history of fever and dysuria. Urine sample of this patient was sent to the biochemistry laboratory for urinalysis and the Urine Full Report obtained is given below:

Colour	Pale yellow	Leukocyte esterase	4+
Specific gravity	1.020	WBC	60-70/HPF
pH	6.0	RBC	2-3/HPF
Protein	Trace	Cast	WBC cast few/HPF
Glucose	Nil	Epithelial cells	Few
Ketone	Negative		
Bilirubin	Negative		
Urobilinogen	1 mg/dL		

4.1.1 Identify the abnormalities on the above mentioned report. **(30 Marks)**

4.1.2 Based on the above report what could be the probable diagnosis? **(05 Marks)**

4.2 Write the biochemical principle of the following tests using reagent strip method.

4.2.1 Urine bilirubin **(15 Marks)**

4.2.2 Leukocyte esterase **(15 Marks)**

4.3 Briefly explain the biochemical changes that would occur in the following parameters on stored samples.

4.3.1 Urine pH **(15 Marks)**

4.3.2 Urine glucose **(15 Marks)**

4.4 List two methods used to measure urine specific gravity in a laboratory. **(05 Marks)**

5. **5.1** List four (04) indications for stool analysis. **(20 Marks)**

5.2 Write the principle of Faecal Occult Blood Test (FOBT). **(20 Marks)**

5.3 List two (02) causes for false positive and two (02) causes for false negative results on Faecal Occult Blood test (FOBT). **(20 Marks)**

5.4 A 15 year old boy presented with fever, headache and neck stiffness of three days duration. A pyogenic bacterial meningitis was suspected and a lumbar puncture was performed.

5.4.1 List two (02) other indications for the lumbar puncture. **(10 Marks)**

5.4.2 What investigations would you perform with the cerebrospinal fluid (CF) obtained by the lumbar puncture and expected findings in this patient. **(30 Marks)**

6. **6.1** Describe the followings of sodium estimation by a flame photometer.

6.1.1 Principle of the method. **(15 Marks)**

6.1.2 Sample collection and preparation **(10 Marks)**

6.1.3 Procedure **(35 Marks)**

6.2 **6.2.1** List the proteins in the α_2- globulin fraction. **(10 Marks)**

6.2.2 Explain the clinical significance of estimating one of the above-mentioned proteins listed in 6.2.1. **(30 Marks)**

7. **7.1** What is Oral Glucose Tolerance Test (OGTT). **(10 marks)**

7.2 Explain how a patient is prepared for OGTT and the OGTT is performed. **(20 marks)**

7.3 Explain the type of results that you expect for the OGTT in prediabetic and diabetic patients. **(20 marks)**

7.4 List the conditions which would alter the results of OGTT, other than those said in 7.3, with reasons. **(30 marks)**

7.5 Give the functions of Albumin. **(20 Marks)**

8. **8.1** A 55 year old chronic diabetic patient was admitted to the Hospital with hyperventilation and fruity breath. Arterial blood gas (ABG) analysis revealed that his anion gap was elevated.

8.1.1 What is the underlying metabolic derangement in this patient?

(10 marks)

8.1.2 Explain the basis of development of the above said condition?

(45 marks)

8.1.3 List any two sites for ABG puncture? **(10 marks)**

8.2 Give the steps of assessment of arterial blood gas analysis and how will you arrive at a conclusion. **(35 marks)**