

UNIVERSITY OF JAFFNA, SRI LANKA
BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES
FIRST YEAR SECOND SEMESTER EXAMINATION- JANUARY 2013

MLSCB 1206 CLINICAL BIOCHEMISTRY

PAPER II

Date: 01.02.2013

Time: 2 hours

ANSWER ALL EIGHT QUESTIONS.

1.
 - 1.1 List five selection criteria for preparation of a good buffer solution. (10 Marks)
 - 1.2 You are provided with 0.2 M solutions of sodium dihydrogen phosphate and disodium hydrogen phosphate. You are requested to prepare 20mL of 0.1 M phosphate buffer solution at pH 7.0. The pKa for this buffer system is 6.8. The log value of 0.2 is 1.585.
 - 1.2.1 Calculate the ratio of conjugate base to acid of the above solution using the Henderson-Hasselbalch equation. (35 Marks)
 - 1.2.2 Write the procedures for preparing the above phosphate buffer solution at pH 7. (20 Marks)
 - 1.2.3 What are the limitations of the phosphate buffer while using it in the experiments and how would you minimize the limitation. (35 Marks)
2.
 - 2.1 Write the steps in performing internal quality control (QC) for the measurement of haemoglobin concentration by using fully automatic biochemical analyser. (75 Marks)
 - 2.2 What are the common post-analytical errors and how would you minimize the above errors. (25 Marks)

3. 3.1 Explain the precautions and procedures followed in urinalysis by using 'Urine strip'. (50 Marks)
- 3.2 Briefly explain the biochemical principles of the measurements of following urine strip parameters.
- 3.2.1 Glucose. (25 Marks)
- 3.2.2 Urobilinogen. (25 Marks)
4. 4.1 List 5 common indications for 'lumba puncture'. (20 marks)
- 4.2 List the important protocols would you consider when receiving CSF sample. (20 Marks)
- 4.3 Give the "CSF full report" of a normal individual (25 marks)
- 4.4 How would you differentiate the CSF full report of viral meningitis from TB meningitis? (35marks)
5. 5.1 Give the principles of electrophoresis (20 Marks)
- 5.2 Name the component of electrophoretic apparatus (20 Marks)
- 5.3 Draw and label electrophoretic pattern of serum protein of normal individuals. (25Marks)
- 5.4 How would you differentiate the serum electrophoretic pattern of Multiple myeloma and normal individuals (35 Marks)

6. A 14 year old boy was brought to a General physician with the history of fever of 40.6°C and shaking chills for the previous day. On physical examination, he had mild right costovertebral angle tenderness. The urine report was given below.

Macroscopic Urinalysis			
Color	:Yellow	Glucose	:Negative
Specific Gravity	:1.017	Ketones	:+
pH	:6.5	Bilirubin	:Negative
Protein	:Trace	Urobilinogen	:Normal
LeukocyteEsterase	:4+	Blood	:Negative
Microscopic Urinalysis			
WBC/hpf	:>50/hpf		
RBC/hpf	:5-10/hpf		
Casts	:WBC cast +		
Other	:Occasional transitional cells		

- 6.1 What could be the probable condition? (15 Marks)
- 6.2 Comment on the appearance of the urine. (20 Marks)
- 6.3 Write the instruction that you would give to the boy to collect the urine samples for the above report. (40 Marks)
- 6.4 Briefly describe the methods that are used to detect the protein in the urine other than strip method. (25 marks)

7.

7.1 List 2 indications to perform blood gas analysis. (20 Marks)

7.2 What are the precautions you would take during phlebotomy procedure? (30 Marks)

7.3 A 45 year old female suffering from bronchial asthma was brought to emergency in a critical state with extreme difficulty in breathing. You are requested to perform the blood gas analysis.

A report of blood gas analysis of the above mentioned patient is given as follows

Parameters	Values	Normal range
pH	- 7.3	7.35-7.45
P _{CO2}	- 46 mm Hg	35-45 mm Hg
P _{O2}	- 55 mm Hg	75- 100 mm Hg
HCO ₃ ⁻	- 24 mEq/L	22-26 mEq/L

7.3.1 What is the probable condition of above mentioned patient? (20 Marks)

7.3.2 List 5 causes of above mentioned condition in 7.3.1 (30 Marks)

8. 8.1 List the 5 causes for cholestasis. (20Marks)

8.2 Explain the biochemical alterations that could take place due to cholestasis. (50 Marks)

8.3 Write short notes on 'Blood Urea Nitrogen (BUN) test'. (30 Marks)