File.

Date: 13th November 2019   Time: 9.00 a.m. – 11.00 a.m.   Duration: 02 hours

Answer all questions   **Index Number:** ....

1.

1.1 Pre analytical phase is an important component of the total testing process.

    1.1.1 State **five** pre-analytical factors which could affect the results of serum electrolyte analysis, giving examples.   *(20 marks)*

    1.1.2 Outline **four** actions that could be taken by the laboratory to minimize pre-analytical errors affecting general biochemical results.   *(20 marks)*

1.2 Plasma glucose is one of the commonest tests requested from the Clinical Biochemistry laboratory.

    1.2.1 State two factors you would check regarding the glucose calibrator when buying reagent kits for glucose analysis.   *(10 marks)*

    1.2.2 State how you would verify the accuracy and precision of plasma glucose results in the laboratory during the analytical phase.   *(20 marks)*

1.3 Sri Lanka Accreditation board assesses clinical laboratories for the quality and competence for testing.

    1.3.1 What is the ISO standard relevant for quality of clinical laboratory testing?   *(05 marks)*

    1.3.2 State **three** advantages to the laboratory by obtaining accreditation with the above standard?

                                                                                                          (15 marks)

    1.3.3 List the documents/records that should be maintained in the laboratory regarding equipment as required by the above ISO standard?   *(10 marks)*
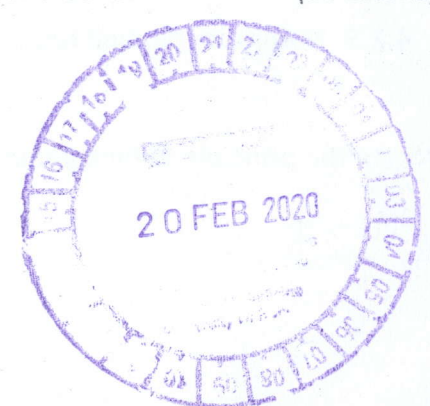
2.

2.1 Briefly describe the biochemical changes observed in the following conditions.   *(30 marks)*

    2.1.1 Acute myocardial infarction

    2.1.2 Cirrhosis

    2.1.3 Cushing syndrome

2.2 Briefly describe the clinical significance of the following tests. *(30 marks)*

    2.2.1 Serum potassium

    2.2.2 Serum gamma glutamyl transferase (GGT)

    2.2.3 Serum TSH

2.3 Explain the reasons for the following practices. *(40 marks)*

    2.3.1 Blood sample for serum cortisol is collected at 9.00 a.m.

    2.3.2 Blood sample for serum ACTH is collected into a pre-chilled, EDTA tube.

    2.3.3 Patient preparation is required for fecal occult blood test by guaiac method

    2.3.4 Sample for arterial blood gas analysis is collected into a heparinized tube and transported anaerobically in melting ice.

3.

3.1 Draw and label a schematic diagram of a Gas Chromatography (GC) apparatus. *(25 marks)*

3.2 List **two** types of columns used in GC. *(10 marks)*

3.3 Comment on the separation efficiency of each column listed in 3.2 using the Van Deemter equation.

(35 marks)

3.4 Briefly describe the following terms in chromatography.

    3.4.1 Temperature programming in GC

    3.4.2 Reverse phase chromatography in clinical laboratory

    3.4.3 Gradient elution in liquid chromatography *(30 marks)*

4.

4.1 State the principle behind radioimmunoassay. *(25 marks)*

4.2 Briefly describe the following terms in relation to radioimmunoassay.

    4.2.1 Total count

    4.2.2 Non-specific binding tubes

    4.2.3 Maximum binding tubes *(45 marks)*

4.3 State the principle behind gamma counter used in radio-immunoassays. *(30 marks)*