UNIVERSITY OF JAFFNA, SRI LANKA

FACULTY OF ALLIED HEALTH SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION IN BScHons (MLS)-2020

MLSMT 1213 MEDICAL LABORATORY TECHNOLOGY II

Date: 06.09.2022   **Time: 2 Hour**

Answer all <u>Six</u> Questions.

1. 1.1 Explain the working principle of atomic absorption spectroscopy.   (20 Marks)

   1.2 Describe the causes and corrective actions of the following interferences that may occur in atomic absorption spectroscopy.

       1.2.1 Spectral interferences   (20 Marks)

       1.2.2 Chemical interferences   (20 Marks)

       1.2.3 Ionization interference   (20 Marks)

   1.3 Briefly explain the advantages of Fourier-transform infrared (FTIR) spectrometers over Dispersive infrared spectrometers.   (20 Marks)

2. 2.1 Describe the working principle of,

       2.1.1 Turbidimetry   (20 Marks)

       2.1.2 Vacuum concentration   (20 Marks)

       2.1.3 Freeze-drying or lyophilization   (20 Marks)

   2.2 Schematically explain the instrumentation of a double-beam UV-visible spectrophotometer.   (40 Marks)

3. 3.1 A crude protein extract obtained from garlic gloves was found to contain protein X. The isoelectric pH of protein X is 5.0. Explain how you would separate protein X from the crude sample using ion exchange chromatography.   (70 Marks)

   3.2 Explain how Reverse phase High-Performance Liquid Chromatography (HPLC) differs from Normal phase HPLC.   (30 Marks)

4. 4.1   Give the basic principle of,

     4.1.1. Size exclusion chromatography   **(30 Marks)**

     4.1.2. Hydrophobic interaction chromatography   **(30 Marks)**

  4.2   Explain how you would carry out a paper chromatography to separate amino acids.

                      (40 Marks)

5. 5.1   Explain how Agarose Gel Electrophoresis is performed to separate DNA fragments obtained from Polymerase Chain Reaction.   **(80 Marks)**

  5.2   State the importance of using Ethidium Bromide in Agarose Gel Electrophoresis.

                      (20 Marks)

6. Write short notes on

  6.1   Working principle of Severinghaus-style PCO_2 electrode.   **(30 Marks)**

  6.2   Applications of Mass spectrometry.   **(30 Marks)**

  6.3   Advantages and limitations of total laboratory automation.   **(40 Marks)**