UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
SECOND YEAR SECOND SEMESTER EXAMINATION IN BScHons (MLS) - 2023
MLSHE 2225 HAEMATOLOGY II
PAPER II

**Date: 05.06.2025** **Time: 2 hours**

**Answer all Six Questions.**

**Answer Part A and Part B in Separate Answer Books.**

## Part A

1. Prothrombin Time (PT) and Activated Partial Thromboplastin Time (APTT) are routine tests used to investigate the coagulation state of a patient.

   **1.1.** Describe the principle of PT and APTT. **(30 Marks)**

   **1.2.** Name the anticoagulant of choice and its ratio suitable to collect for the investigation of PT and APTT. **(10 Marks)**

   **1.3.** Enumerate how pre-analytical errors are prevented in PT and APTT testing. **(20 Marks)**

   **1.4.** Explain how a prolonged APTT can be evaluated to exclude coagulation inhibitors. **(40 Marks)**

2. Haemostasis is the physiological process that stops bleeding from damaged blood vessels.

   **2.1.** Outline the mechanism by which platelet adhesion, activation, and aggregation occur in primary hemostasis. **(40 Marks)**

   **2.2.** Briefly explain the role of the following in hemostasis

   **2.2.1.** Protein C and S **(10 Marks)**

   **2.2.2.** Tissue factor pathway inhibitor (TFPI) **(10 Marks)**

   **2.2.3.** Antithrombin-III **(10 Marks)**

   **2.3.** Diagrammatically explain the coagulation cascades in the process of normal hemostasis. **(30 Marks)**

3. A 70-year-old male presents to the outpatient clinic with complaints of persistent back pain, fatigue, and unintentional weight loss over the past three months. Clinicians suspect the possibility of multiple myeloma.

**3.1.** Briefly describe the morphological appearance of a plasma cell under the light microscope. **(20 Marks)**

**3.2.** Outline the distribution of lymphoid cells in the human body. **(20 Marks)**

**3.3.** Provide a brief explanation of how the following tests are scientifically relevant to the diagnosis of multiple myeloma.

**3.3.1.** Serum protein electrophoresis and immunofixation **(15 Marks)**

**3.3.2.** Urine Bence Jones protein test **(15 Marks)**

**3.3.3.** Serum free light chain assay **(15 Marks)**

**3.3.4.** Bone marrow aspiration cytology **(15 Marks)**

4. A 55-year-old male presents to the clinic with complaints of fatigue, early satiety, and an unintentional weight loss over the past two months. Findings are consistent with Chronic Myeloid Leukemia (CML) in the chronic phase, confirmed by the presence of the Philadelphia chromosome and BCR-ABL1 fusion gene.

**4.1.** Briefly describe the morphological appearance of an Acute Myeloid Leukemia (AML) blast under the light microscope. **(20 Marks)**

**4.2.** Explain the molecular mechanism by which the Philadelphia chromosome contributes to leukemogenesis. **(60 Marks)**

**4.3.** List five (5) laboratory techniques that can diagnose the Philadelphia chromosome **(20 Marks)**

## Part B

5. You receive the following samples from a patient suspected of having haemolytic anaemia. EDTA sample of blood, clotted sample of blood, and a urine sample.

   **5.1.** Briefly describe how you would verify the suitability of an EDTA sample for analysis. **(40 Marks)**

   **5.2.** List **four (04) tests** which can be performed from EDTA samples, which are useful in the diagnosis of haemolytic anaemia, **giving expected findings** in each test in haemolytic anaemia. **(30 Marks)**

   **5.3.** Briefly discuss how **tests** which can be performed from a urine sample can be used to differentiate types of haemolytic anaemia. **(30 Marks)**

6. A recently vacated area in a hospital will be used to establish a haematology laboratory.

   **6.1.** Briefly describe how you would assess the adequacy of the space. **(30 Marks)**

   **6.2.** Briefly describe the basic safety requirements that you are going to specify for the laboratory. **(30 Marks)**

   **6.3.** Briefly describe what do you understand by 'equipment management'. **(40 Marks)**