

**UNIVERSITY OF JAFFNA, SRI LANKA**  
**FACULTY OF ALLIED HEALTH SCIENCES**  
**SECOND YEAR SECOND SEMESTER EXAMINATION IN**  
**BScHons (MEDICAL LABORATORY SCIENCES)- 2021**  
**MLSHE 2225 HAEMATOLOGY II**  
**PAPER II**

Date: 11.08.2023

Time: 2 hours

Answer all Six Questions.

Answer Part A and B in Separate Answer Books.

Part A

1. Laboratory results of a patient in the Intensive Care Unit (ICU) at Teaching Hospital Jaffna with a history of severe sepsis, poorly controlled diabetes mellitus in septic shock with purpura, haematuria, and bleeding from venipuncture sites are given below.

| Test   | Results             |
|--|---------------------|
| Bleeding Time (BT)                           | 9 sec               |
| Prothrombin Time (PT)                        | 26 sec              |
| Activated Partial Thromboplastin Time (APTT) | 72 sec              |
| Thrombin Time (TT)                           | 26 sec              |
| Fibrinogen concentration                     | 4.5 g/L             |
| Platelet count                               | $80 \times 10^9 /L$ |



- 1.1. Interpret the laboratory results. **(20 Marks)**
- 1.2. State the most likely diagnosis of the above patient. **(10 Marks)**
- 1.3. Explain how pre-analytical errors are prevented in PT and APTT testing. **(30 Marks)**
- 1.4. Explain how you would exclude the presence of coagulation inhibitors when APTT is prolonged. **(40 Marks)**

2. Hematological malignancies are cancers that affect the blood, bone marrow, and lymph nodes.
  - 2.1. Define the following,
    - 2.1.1. Oncogene (10 Marks)
    - 2.1.2. Tumor suppressor gene (10 Marks)
  - 2.2. Describe the role of the Philadelphia chromosome in leukemogenesis. (60 Marks)
  - 2.3. List five (5) laboratory techniques which can detect the presence of the Philadelphia chromosome in leukaemia patients. (20 Marks)
  
3. Hemostasis is the physiological process by which bleeding ceases.
  - 3.1. Explain the role of the following in hemostasis.
    - 3.1.1. von Willebrand factor (30 Marks)
    - 3.1.2. Protein C and S system (30 Marks)
  - 3.2. Diagrammatically describe the coagulation cascades of normal hemostasis. (40 Marks)
  
4.
  - 4.1. Outline the scientific basis of the use of the following tests in the diagnosis of multiple myeloma.
    - 4.1.1. Serum protein electrophoresis and immunofixation (10 Marks)
    - 4.1.2. Urine Bence Jones protein test (10 Marks)
    - 4.1.3. Serum free light chain assay (10 Marks)
    - 4.1.4. Bone marrow aspiration cytology (10 Marks)
  - 4.2. Write short notes on
    - 4.2.1. Dilute Russell's Viper Venom Time (dRVVT) assay (30 Marks)
    - 4.2.2. Principle of PFA-100 system (30 Marks)

**Part B**

5. Management of haematology laboratory is very important to assure reliable reports.
- 5.1. Outline how basic outline of the haematology laboratory is designed (focus entry, exit, walls, separation, floor, work tops, work flow arrangements and safety requirements) **(25 Marks)**
- 5.2. Describe what do you mean by a validated test **(25 Marks)**
- 5.3. Outline key components in personnel management in a laboratory. **(25 Marks)**
- 5.4. Outline the basic management of automated FBC analyser. **(25 marks)**
6. Diagnosis of haemolytic anaemia needs major contributions from laboratory.
- 6.1. Outline how following laboratory tests are helpful in the diagnosis of haemolytic anaemia.
- 6.1.1. Reticulocyte count **(05 Marks)**
- 6.1.2. Serum LDH **(05 Marks)**
- 6.1.3. Urine analysis **(15 Marks)**
- 6.2. Draw a flowchart starting from routine investigation up to confirmation of following haemolytic anaemias. Indicate salient findings expected in each test.
- 6.2.1. Beta thalassaemia major **(25 Marks)**
- 6.2.2. Hereditary spherocytosis **(25 Marks)**
- 6.2.3. Autoimmune Haemolytic anaemia **(25 Marks)**

