Instructions:                                        Index Number:.........................

**Answer two questions only. First question is compulsory.**

1. A clinician requested a Full Blood Count test on a patient who was suffering from fever for more than three days. Answer the following questions;

    1.1. State the sample requirements for the above test.                    (10 marks)

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    1.2. Mention **five** rejection criteria related to this test.                    (10 marks)

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    1.3. Explain the principles used in an automated haematology analyser.          (40 marks)

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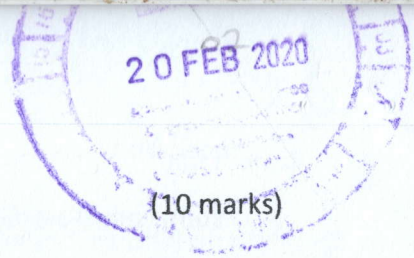..............................................................................................................
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1.4. Give three examples where you can get misleading results from an automated haematology analyser. (30 marks)

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1.5. Name two other tests that may be requested on this patient. (10 marks)

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Index No :...................................

2. "Stem cells transplantation has opened up new era in Laboratory Medicine."

2.1. State **three** reasons for stem cell transplantation. (15 marks)

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2.2. List **three** sources of stem cells used in stem cell transplantation. (15 marks)

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2.3. Explain the function of G- CSF in collection of stem cells. (40 marks)

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2.4. Briefly describe the following.

    2.4.1.  Allogenic stem cell transplant      (10 marks)

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    2.4.2.  Graft vs Cancer effect      (10 marks)

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    2.4.3.  Positive selection of CD34+ cells      (10 marks)

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3. A 34 year-old woman presents with Hb 6.8 g/dL; HCT 21%, platelets 210 x $10^9$/L, WBC 9.0 x$10^9$/L, LDH 2500 (NR<280). The film shows spherocytes.

3.1. List the differential diagnoses. (20 marks)

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3.2. Briefly explain the pathophysiology of one condition you mentioned in 3.1 above. (30 marks)

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3.3 List the investigations required to arrive at a diagnosis. (20 marks)

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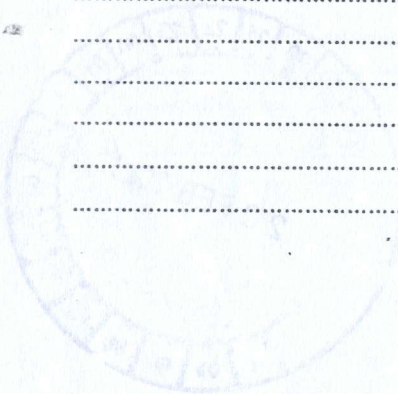
3.4.  What is Reticulocyte Index?                                    (15 marks)

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3.5.  Her Reticulocyte count is 14%. Calculate the Reticulocyte Index.          (5 marks)

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3.6.  Her DAT was repeatedly negative at the blood bank of local hospital. But it was positive
      when it is performed in a reference laboratory.

      Explain the possible causes.                                  (10 marks)

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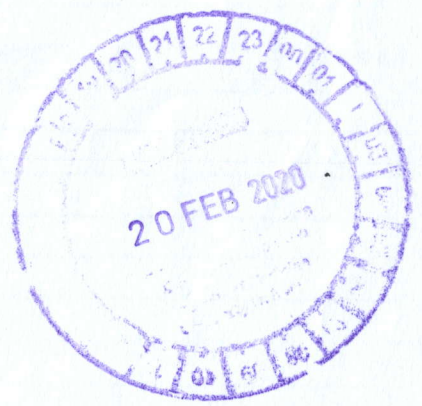
**FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA**
**B.Sc. Medical Laboratory Science Degree Programme**
**Year End Examination - Year 2 – 6$^{th}$ Batch**
**Haematology – Theory II - Essay (MLS 2103)**

Thursday 28$^{th}$ April 2016                                    Time: 11.30 – 12.30 pm
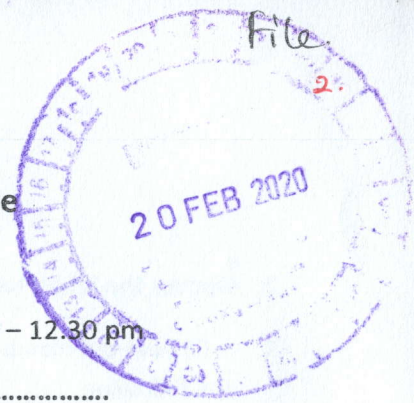
Instructions:                                                    Index Number:...............................

Answer two questions only. First question is compulsory.                                    ③①

1.  A 61 year-old lady admitted to the hospital with features of glossitis, angular stomatitis and mild symptoms of malabsorption.

    Following are the results of her Full Blood Count report.
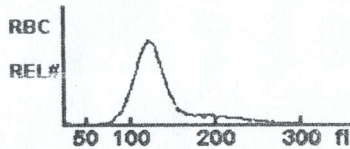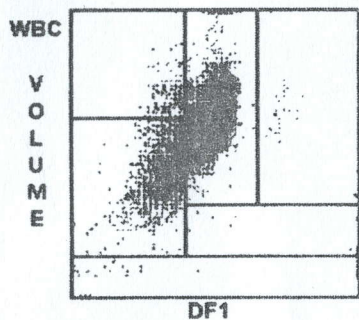
| WBC | 12.1 | | |
|-----|------|---|---|
| | | **%** | **#** |
| NE | 71.1 | | 8.5 |
| LY | 15.9 | | 1.9 |
| MO | 3.3 | | 0.5 |
| EO | 0.5 | | 0.1 |
| BA | 8.7 | | 1.1 |
| RBC | 2.69 | | |
| HGB | 10.6 | | |
| HCT | 31.6 | | |
| MCV | 117.6 | | |
| MCH | 39.6 | | |
| MCHC | 33.7 | | |
| RDW | 14.1 | | |
| PLT | 578 | | |
| MPV | 7.2 | | |

(WBC VOLUME vs DF1 scatter plot; RBC REL# histogram with x-axis 50 100 200 300 fl)

1.1.    Interpret her Full Blood Count report.                                    (15 marks)

1.2.    What is the haematological diagnosis?                                    (05 marks)

1.3.    Mention possible findings of the blood picture and the bone marrow smear for the above patient.
                                                                                (30 marks)

1.4.    Mention three hematological investigations that can be used to screen this patient for the possible causes of this disease condition.                                    (15 marks)

1.5.    The patient was requested to perform an absorption test using an oral dose of radioactive cobalt ($^{57}$Co)-labeled cyanocobalamin.

        1.5.1.    Name the investigation.                                    (05 marks)

        1.5.2.    Write down the procedural steps in the above investigation.                    (30 marks)

2. Discuss the laboratory diagnosis of Acute Myeloid Leukaemia.             (100 marks)

3. A 65 year-old man is admitted for an appendicectomy. Routine pre-operative coagulation screening reveals the following,

   Prothrombin time 10.8 S (9.6-11.6 S)

   Activated partial thromboplastin time 49 S (26 – 32 S)

   Discuss your approach to this problem from a clinical and laboratory point of view.             (100 marks)