



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

**SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF
BACHELOR OF SCIENCE IN CLINICAL MEDICINE AND COMMUNITY HEALTH
THIRD SEMESTER 2022/2023
[MAY-AUGUST, 2023]**

MEDS 201: HAEMATOLOGY AND ONCOLOGY

STREAM: Y2S3

TIME: 3 HOURS

DAY: THURSDAY, 9:00 – 12:00 PM

DATE: 27/07/2023

INSTRUCTIONS

- 1. Do not write anything on this question paper.***
- 2. Answer ALL questions in Section A and B (Compulsory). In section C, Answer question ONE (Compulsory) and any other question.***

Answer ALL questions in Section A

1. Anemia of chronic disorders is found in cases of:
 - A. Lung abscess
 - B. Rheumatoid arthritis
 - C. Chronic renal failure
 - D. Tuberculosis
 - E. All of the above
2. The normal and functional platelet has a life span of approximately:
 - A. 10 days
 - B. 80 days
 - C. 120 days
 - D. 45 days
 - E. 35 days
3. The normal RBC count for adult female is:
 - A. $2.8 - 3.8 \times 10^{12} / L$
 - B. $3.8 - 4.8 \times 10^{12} / L$
 - C. $2.8 - 3.8 \times 10^9 / L$

- D. $3.8 - 4.8 \times 10^9 / L$
E. $4.8 - 5.8 \times 10^9 / L$
4. When group-specific blood is in short supply, how do you select the 'next best' for transfusion?
- A. For group AB patients the second choice should be group A or B red cells
 - B. For patients of group A or B, the second choice should be group O
 - C. RhD positive blood may be administered to RhD negative recipients
 - D. None of the above
 - E. All of the above
5. The International for Standardization in Haematology (SI) accepts which suitable units for the measurement of Mean Cell Volume concentration
- A. fl
 - B. g/dl
 - C. g/l
 - D. mmol/l
 - E. pg
6. Neutrophil Hypersegmentation can result from
- A. Iron deficiency
 - B. Vitamin B12 deficiency and Folic acid deficiency
 - C. Renal failure
 - D. Liver failure
 - E. Anaemia of chronic disease
7. Laboratory evidence of hemolysis includes all of the following except
- A. Hyperbilirubinemia (indirect)
 - B. Reticulocytosis
 - C. Increased urine Urobilinogens
 - D. Increased haptoglobin
 - E. Bone marrow show erythroid hyperplasia
8. The following conditions are associated with lymphocytosis except:
- A. Cytomegalovirus infection
 - B. Lymphoma

- C. Infectious mononucleosis
 - D. Myocardial infarction
 - E. Chronic lymphocytic leukemia
9. FAB classification classifies acute leukemia according to:
- A. Cytogenetic abnormalities
 - B. Immunological characteristics
 - C. Both cytogenetic and immunological abnormalities
 - D. Morphological characteristics
 - E. Morphological, phenotypic and cytogenetic characteristics
10. In ABO incompatibility disease of the newborn, all of the following are true except
- A. The disease is milder because A and B antigens are weak in the fetus
 - B. It can occur in the first pregnancy without prior sensitization
 - C. Anemia and mild jaundice
 - D. Blood film shows spherocytosis and reticulocytes
 - E. Coomb's test is strongly positive
11. In megaloblastic anaemia one of the following is not true:
- A. Mild erythrocytophilia
 - B. Mild leucopenia
 - C. Hypochromic
 - D. Decreased serum vitamin B12 or folate
 - E. Macrocytosis
12. Candidates for RoguM must satisfy the following conditions:
- A. The newborn must be Rh Positive and not jaundiced
 - B. The mother must be Rh negative and antibody screening test positive
 - C. The mother must be Rh negative and antibody screening test negative
 - D. The mother must be Rh positive with high titer of anti-D
 - E. The mother must be Rh negative and the father test Rh negative
13. Serum from blood group A agglutinates;
- A. B cells
 - B. A cells
 - C. O cells

- D. O_h cells
 - E. Duff cells
14. The following are courses of thrombocytopenia except?
- A. Bacterial infections
 - B. Bone marrow failure
 - C. Some viral infections
 - D. Destruction of platelets by immune antibodies
 - E. Hemophilia
15. Which of the following is not a requirement for erythropoiesis?
- A. Erythropoietin
 - B. Amino acids
 - C. Magnesium
 - D. Iron
 - E. Folates
16. Lymphoproliferative disorders include all of the following except:
- A. Hairy cell leukemia
 - B. Chronic lymphocytic leukemia
 - C. Non-Hodgkin's lymphoma
 - D. Chronic myeloid leukemia
 - E. Hodgkin's lymphoma
17. Given the haemoglobin concentration of a healthy individual as 14 g/dL, estimate the PCV value
- A. 28%
 - B. 42%
 - C. 7%
 - D. 56%
 - E. 70%
18. The primary site of hematopoiesis in the fetus between the 10th and 20th week of gestation is?
- A. Lymph nodes
 - B. Bone marrow
 - C. Thymus

- D. Liver
 - E. Yoke sac
19. Which of the following best illustrates natural antibodies in blood transfusion science?
- A. IgG class
 - B. IgM class
 - C. IgD class
 - D. IgA class
 - E. IgE class
20. Which of the following is NOT true with capillary blood sample?
- A. Ease to harvest
 - B. Used for blood parasitology
 - C. Used for peripheral blood film
 - D. Can make both thick and thin films
 - E. Used to determine ESR.
21. What is the importance of detecting D variant (weak D and partial D) phenotypes?
- A. This is to prevent D variant cells being transfused to a recipient who is RhD negative
 - B. So that D variant (weak D or partial D) phenotype should mean that the unit is labelled as RhD positive
 - C. To prevent such cells from provoking the production of anti-D in the maternal circulation
 - D. To avoid multiple transfusion of an individual
 - E. To utilize D^U test in blood transfusion science
22. To detect the cause of the iron deficiency anemia, which of the following is the test to be done?
- A. Stool analysis for parasites
 - B. Stool analysis for occult blood
 - C. Urine analysis for hematuria
 - D. Full haemogram
 - E. all of the above

23. Rh negative mothers may have been sensitized to Rh-positive blood of the following except:
- A. A second trimester abortion
 - B. A childhood blood transfusion
 - C. Being a Rh negative child of a Rh positive mother
 - D. A previous pregnancy with a Rh positive baby
 - E. A previous pregnancy with a Rh negative baby
24. Which of the following describes reverse grouping technique?
- A. Known antibodies are used to detect antigen on red blood cell
 - B. Known cells are used to detect antibodies in the serum
 - C. Washing cell using large volume of saline
 - D. Mixing cell and physiological saline in a test tube.
 - E. Using 4% cell suspension in tube methods of grouping technique
25. The five types of white blood cells found in normal peripheral blood are:
- A. Lymphocytes, monocytes, neutrophils, basophils, and lymphoblast
 - B. Lymphocytes, neutrophils, monocytes, myeloblasts, and eosinophils
 - C. Monocytes, myeloblasts, eosinophils. Lymphocyte and basophils
 - D. Lymphocytes, neutrophils, monocytes, eosinophils and basophils
 - E. Lymphoblast, neutrophils, monocytes, eosinophils and basophils
26. Who among the following discovered the Rhesus blood group system?
- A. Hisfield
 - B. Castello
 - C. Fisher-race
 - D. Karl Landsteiner and Weiner
 - E. Marcacus
27. Which of the following best shows the correct composition of the H-active substance?
- A. The precursor substance and L-Fucose
 - B. The precursor substance and L-Sucrose
 - C. The precursor substance and N-Acetylgalactosamine
 - D. The precursor substance and D-Fucose
 - E. The precursor substance and L-Galactose

28. Why are people with O blood known as universal donors?
- A. Because antibodies against A and B antigens are not present in their plasma.
 - B. Because A and B antigens are present on their red blood cells.
 - C. Because neither A nor B antigens are present on their red blood cells.
 - D. Because type O blood is the most common blood type in the United States.
29. The clinical sign of spontaneous bleeding in small areas of the skin and mucous membranes is termed as:
- A. Ecchymosis
 - B. Petechial bleeding
 - C. Immuno-thrombocytopenias
 - D. Essential thrombocytopenia
 - E. Pseudo thrombocytopenia
30. A falsely high estimate of haemoglobin concentration with some instruments can result from
- A. The presence of giant platelets
 - B. Reticulocytosis
 - C. Hyperlipidaemia
 - D. Paraproteinaemia
 - E. Marked elevation of the white cell count
31. A falsely high white cell counts a full haemogram can result from
- A. Leucocyte aggregation
 - B. The presence of nucleated red blood cells
 - C. The presence of giant platelets
 - D. Ageing of the blood sample
 - E. Non-lysis of red blood cells
32. The acute phase of HIV infection may cause
- A. Lymphocytosis
 - B. Lymphocytopenia
 - C. Atypical lymphocytes
 - D. Detached nuclear fragments in neutrophils
 - E. Auer rods in neutrophil precursors

33. A myeloid Leukaemia can result from which of the following appropriate viral infections
- A. Human immunodeficiency virus (HIV)
 - B. Epstein-Barr virus (EBV)
 - C. Cytomegalovirus (CMV)
 - D. Human herpesvirus 6 (HHV6)
 - E. Human T-cell lymph tropic virus (HTLV-I or II)
34. Which of the following items are used in the preparation of normal saline for cellular studied?
- A. 85gms sodium chloride in 100mls distilled water
 - B. 0.85gms sodium chloride in 1000mls distilled water
 - C. 8.5gms sodium chloride in 1mls distilled water
 - D. 0.85gms sodium chloride in 100mls distilled water
 - E. 0.85gms sodium chloride in 10mls distilled water
35. Which of the following is NOT true with venous blood sample?
- A. Ease to harvest
 - B. Used for blood parasitology
 - C. Used to describe myeloid and erythroid ratios
 - D. Can make both thick and thin films
 - E. Used to determine ESR.
36. Effective function of the red blood cell depends on the following **EXCEPT:**
- A. Negative surface charge to permits it to repulse other circulating cells
 - B. Its unique tear drop shape
 - C. Its ability to prevent oxidative stress to the hemoglobin molecule
 - D. Maintenance of the four iron atoms on each hemoglobin molecule in the ferrous (Fe^{3+}) state
 - E. Its biconcave shape and 7-8 micrometers in diameter
37. Which of the following is ODD one out in hematology?
- A. Bone marrow
 - B. Kidney
 - C. Liver

- D. Spleen
 - E. Endocrine gland
38. Which of the following products is the best for patients with low hematocrit levels?
- A. Plasma rich platelets
 - B. Cryoprecipitate
 - C. Whole blood
 - D. Red blood cells concentrates
 - E. Fresh frozen plasma
39. Which of the following coagulation factor is responsible for Hemophilia B?
- A. Factor VIII
 - B. Factor V
 - C. Factor IX
 - D. Factor II
 - E. Factor VII
40. Which of the following alleles are co-dominant in blood groups?
- A. A/O
 - B. B/O
 - C. A/B
 - D. A/A.
 - E. O/O
41. The characteristic cytogenetic abnormality in chronic myeloid leukemia is:
- A. t (8,21)
 - B. t (9,22)
 - C. t (15,17)
 - D. t (12,21)
 - E. t (8,14)
42. The primary site of hematopoiesis in the adults is best and exclusively performed in.
- A. Lymph nodes

- B. Bone marrow
 - C. Thymus
 - D. Liver
 - E. Spleen
43. Diseases that can be transmitted through blood transfusion include the following except,
- A. Viral infections like hepatitis
 - B. HIV infections
 - C. Syphilis
 - D. Malaria
 - E. Graves' disease
44. Which of the following does not describes Quantitative changes in WBC?
- A. Differential gives the relative percentage of each leucocyte
 - B. Absolute value gives the actual number of each WBC/mm³ of blood
 - C. Absolute count= Total WBC x percent
 - D. Explains the Morphologic changes
 - E. Explains the outliers' values in WBC
45. Which one of the following is the best indicator of Agranulocytosis?
- A. Decrease in the count of all or one agranulocytic component
 - B. Increase in the count of all or one of the granulocytic component
 - C. Increase in the number of neutrophils and / or its precursors
 - D. Applied to chronic neutrophilia with marked leukocytosis (>20 x 10⁹/L)
 - E. TWBC lower than the reference range for the age is defined
46. The following cannot cause Infectious Mononucleosis?
- A. Epstein-Barr virus
 - B. Saliva from infected person is the main contagion
 - C. Virus infect epithelial cells and B cells
 - D. Autocrine growth stimulation
 - E. Bacterial infections
47. Which of the following is not a description of Blood Group Basics?
- A. All normal blood groups have "H-substances".
 - B. If only H is added to the red blood cell the person is group O.

- C. If N-acetylgalactosamine is added to H, the person is group A.
 - D. If D-galactose is added to H, the person is group A.
 - E. If both N-acetylgalactosamine and D-galactose are added the person is AB.
48. Which of the following explains the term Polycythemia?
- A. It's an increase in the concentration of rbc in the peripheral blood measured by the rbc count, hemoglobin, or the hematocrit
 - B. Also called erythrocytopenia
 - C. Increased in plasma volume
 - D. Decrease in rbc counts
 - E. Decreased hemoglobin levels
49. Essential Thrombocythemia is a terminology that explain;
- A. Numerous thrombocyte aggregates in peripheral blood smear
 - B. Marked hyporplasia of the megakaryocytes in the bone
 - C. Philadelphia chromosome or bcr/abl gene reagement
 - D. Cytogenetic or morphologic evidence for myelodysplastic syndrome
 - E. Leukoerythroblaststic blood picture
50. Cancer Treatment options depend on the following except?
- A. The type of plasma cell neoplasm.
 - B. The age and general health of the patient.
 - C. Whether there are symptoms or health problems, such as kidney failure or infection, related to the disease.
 - D. Whether the cancer responds to initial treatment or recurs (comes back).
 - E. Blood group genetics

SECTION B (ANSWER ALL QUESTIONS) 60 MARKS

1. Explain how benign conditions of a patient are different from malignances citing examples for each condition. (5marks)
2. Highlight the Most common causes of megaloblastic anemias (5marks)
3. 'Anaemia is not a disease but a condition' explain this phrase as used in hematology (5marks)
4. Living at a high altitude leads to an increase in
 - (a) The white cell count/F
 - (b) The red cell count T/F
 - (c) The haemoglobin concentration T/F
 - (d) The haematocrit T/F
 - (e) The platelet counts T/F (5Marks)
5. Outline any five major indications/reasons for transfusion of blood products (5Marks)

6. Briefly explain the specificity of Iron Deficiency Anaemia from general syndromes (5marks)
7. Explain the formation and functions of erythrocytes from a primitive stem cell of the bone marrow. (5marks)
8. Compare and contrast natural and immune antibodies in blood transfusion science. (5marks)
9. Complete the table below that describes blood grouping systems {10marks}
- | Blood Group | Antigens | Antibodies | Gives blood to | Receives from |
|-------------|----------|------------|----------------|---------------|
| B | | | | |
| A | | | | |
| O | | | | |
| AB | | | | |
| Rhesus +ve | | | | |
| Rhesus -ve | | | | |
10. List any five possible causes of Acute Myelocytic Leukaemia (5Marks)
11. Explain in brief the diagnostic procedure used in oncology (5marks)

SECTION C (ANSWER ANY TWO (2) QUESTIONS IN THIS SECTION) 40

MARKS

1. Describe in details the pathophysiology of Acute Lymphocytic Leukaemia (20marks)
2. As a clinician in a rural health facility, explain briefly steps involved in Diagnostic Work-Up of a patient who presents with Lymph nodes palpated in axilla (20marks)
3. Discuss anemias under the following criterion (20marks)
- Definitions (1marks)
 - Causes (2marks)
 - Classifications (2marks)
 - Major types (4marks)
 - Clinical manifestations (4marks)
 - Laboratory evaluations (4marks)
 - Care and management of anemic patient (3marks)