



*(Knowledge for Development)*

**KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR**

**FIRST YEAR THIRD TRIMESTER**

**MAIN EXAMINATION**

**FOR BACHELOR OF SCIENCE IN NURSING  
DEGREE**

**COURSE CODE: NUR 132**

**COURSE TITLE: HEMATOLOGY AND CLINICAL CHEMISTRY**


**DATE: 23/08/2022**

**TIME: 9:00 am – 12:00 pm**

**INSTRUCTIONS TO CANDIDATES**

Answer ALL Section one (1) MULTIPLE CHOICE QUESTIONS and ALL Section two (2) SHORT ANSWER QUESTIONS and any one (1) section THREE (3) LONG ANSWER QUESTION.

TIME: 3 Hours

This paper consists of 9 printed pages. Please Turn Over   
**KIBU observes ZERO tolerance to examination cheating**

**SECTION A: MULTIPLE CHOICE QUESTIONS**

**50 Marks**

1. The cell maturation sequence of the segmented neutrophil is \_\_\_\_\_.
- A. promyelocyte—myeloblast—myelocyte—metamyelocyte—band or stab—segmented neutrophil (PMN)
  - B. monoblast—promyelocyte—myelocyte—metamyelocyte— band or stab—segmented neutrophil (PMN)
  - C. promyelocyte—myelocyte—metamyelocyte—band or stab—segmented neutrophil (PMN)
  - D. myeloblast—promyelocyte—myelocyte—metamyelocyte— band or stab—segmented neutrophil (PMN)
2. The following are characteristic(s) of erythropoietin except? \_\_\_\_\_.
- A. Glycoproteins
  - B. Secreted by the liver
  - C. Secreted by the kidneys
  - D. Lipoproteins
3. Which of the following sites plays organ in extra- medullary haemopoiesis? \_\_\_\_\_.
- A. Liver
  - B. C. Kidney
  - C. Spleen
  - D. D. Both A and B
4. As a Red blood cell matures, the ratio of nucleus to Haemoglobin \_\_\_\_\_.
- A. Remain the same
  - B. C. Decreases
  - C. Increase
  - D. D. None of the above
5. Which of the following factors are necessary for haemoglobin formation?
- A. First class amino acids
  - B. Copper
  - C. Iron
  - D. All the above
6. The earliest granulocytic maturational stage in which secondary or specific granules appear is \_\_\_\_\_.
- A. myeloblast
  - B. promyelocyte
  - C. monoblast
  - D. myelocyte
7. Which of the following is NOT is not a site for adult Haemopoiesis?
- A. Pelvic
  - B. Yolk sac
  - C. Sternum
  - D. Rib

8. The following are characteristics of Pluripotential stem cell except?
- A. Self-renewal
  - B. Resistant to chemotherapy
  - C. Give rise to any cellular element
  - D. Give rise to erythrocytes only
10. The main adult haemoglobin type (Hb A), constitute \_\_\_\_\_.
- A. 2 alpha chains and 2 delta polypeptides
  - B. 2 alpha polypeptides and 2 delta polypeptides
  - C. 2 alpha chains and 2 beta chains
  - D. 2 beta chains and 2 alpha polypeptides
11. The normal range for reticulocytes in adults is
- A. 0% to 0.5%
  - B. 0.5% to 2.0%
  - C. 0.5% to 1.5.0%
  - D. 1.5% to 2.5%
12. Reduced erythropoietin production might result from?
- A. Erythrocyte deficiency
  - B. increased erythropoiesis
  - C. Damaged kidney
  - D. Infected bone marrow
13. The following are components of blood plasma proteins
- A. Albumin
  - B. Globulins
  - C. Fibrinogen
  - D. All the above
14. Which of the following is a reason for performing a complete blood count
- A. Hemoglobin level
  - B. Nutritional deficiencies
  - C. Bone marrow activity
  - D. All of the above
15. Which one of the following can bring about eosinophilia
- A. Viruses
  - B. Parasite
  - C. Allergy
  - D. B and C
16. Quality in haematology laboratory can be assured at \_\_\_\_\_.
- A. Pre-analytical stage
  - B. Analytical stage
  - C. Post-analytical stage

D. All the above

17. The following statements are advantages of automatic haematology analysers except \_\_\_\_\_.

- A. They analyse and produce results within a very short time
- B. Provide data that are more Precise and Accurate results
- C. Perform multiple tests on a single platform
- D. Platelet aggregation may be incorrectly classified as white blood cells or red blood cells

18. The bevel of the needle should be held \_\_\_\_\_ in the performance of a venepuncture.

- A. sideways
- B. downward
- C. upward
- D. in any direction

19. Relative polycythaemia exists when \_\_\_\_\_.

- A. the plasma volume is increased
- B. increased erythropoietin is produced
- C. the plasma volume is decreased
- D. the total blood volume is expanded

20. Ethylene diamine tetra acetic acid is used as the anticoagulant of choice in the following procedures except \_\_\_\_\_.

- A. Complete blood count
- B. Leucocyte Differential counts
- C. Coagulation studies
- D. Peripheral blood film studies

21. Alterations in the formed elements in the blood are usually

- A. the primary cause of disease
- B. deviations of plasma constituents from the normal values,
- C. a result of disease
- D. proliferation, differentiation and maturation of formed elements

22. The space occupied by the packed red blood cells is referred to as

- A. mean corpuscular volume
- B. hematocrit
- C. mean cell volume
- D. microhematocrit

23. When anticoagulated whole blood is centrifuged, the buffy coat is made up of

- A. plasma and plasma proteins
- B. platelets and plasma
- C. leukocytes and serum
- D. platelets and leukocytes

24. The following are advantages of Red blood cell Distribution Width except
- A. Diagnostic marker of hyperchromasia
  - B. Assist in differential diagnosis
  - C. Following the course of disease
  - D. Recognize RBC abnormality from complete blood count
25. Which of the following blood cells is a Polymorphonucleus cell
- A. Natural killer cell
  - B. Lymphocyte
  - C. Basophil
  - D. Monocyte
26. Identify the condition associated with neutrophilia
- A. Bacterial infection
  - B. Parasitic infection
  - C. Fungal infection
  - D. Allergic reaction
27. The following cells have nuclei except
- A. Proerythroblast and erythrocyte
  - B. Orthochromatic erythrocyte and platelet
  - C. Platelet and erythrocyte
  - D. Megakaryocyte and basophilic erythroblast
28. Which of the following is essential for erythropoiesis
- A. Folic acid and Iron
  - B. All
  - C. Vitamin B12
  - D. Erythropoietin
29. Identify the statement that false describe reticulocytes
- A. This is the remnant of the basophilic cytoplasm, comprising RNA.
  - B. In the Neonates, Count is 2 – 6/Cu.mm.
  - C. Rises to >1 in the first week of life.
  - D. Reticulocytosis is the first change seen in patients treated with Vit B12
30. There are three phases of Hematopoietic Tissue Development, which one is not
- A. Mesoblastic phase
  - B. Hepatic phase
  - C. Medullary phase
  - D. Mesocytic phase
31. Which of the following cell matures in the thymus just before release to the circulatory system
- A. B-lymphocyte
  - B. T-lymphocyte
  - C. Plasma Cell

D. Dendritic cell

32. The first recognizable cell in each cell line is the

- A. Cytoplasmic characteristic
- B. Nuclear characteristic
- C. Blast
- D. Nucleoli

33. Normal maturation of cells is characterized by development of the nucleus and the cytoplasm in a precise fashion, which statement is TRUE about synchronism

- A. Nucleus and cytoplasm develop at the same rate
- B. Nucleus and cytoplasm develop at different rates
- C. Nucleus and cytoplasm do not develop at all
- D. Nucleus and cytoplasm degrade after development

34. Which of the following statement is true

- A. DNA key to division, nucleus
- B. RNA key to maturation, nucleus
- C. Protein-key to division, nucleus
- D. DNA key to maturation, cytoplasm

35. The following are changes in red blood cell due to aging except

- A. Glycosylated hemoglobin increase
- B. Membrane sialic acid increase
- C. Pyruvate dehydrogenase enzymes decrease
- D. General cell density increase

16. The haemopoietic growth factors are glycoprotein hormones that

- A. regulate the proliferation and differentiation of haemopoietic progenitor cells
- B. are of common origin
- C. promote apoptosis
- D. of similar specificities

37. Which of the following hematopoietic cytokine targets Colony forming unit megakaryocyte

- A. thrombopoietin
- B. fibroblastic growth factor
- C. interleukin-11
- D. c-Kit ligand

38. Richard Lewisohn discovered how sodium citrate can be used to store blood in

- A. 1990
- B. 1936
- C. 1961
- D. 1914

39. The normal value of MCHC in n anticoagulated blood is

- A. 32~36 %
- B. 30~36 %
- C. 32~46 %

D. 32~49 %

40. Bite cells are associated with

- A. G6PD deficiency
- B. Thalassemia, lead toxicity
- C. Malaria, babesiosis
- D. Iron deficiency

41. The following changes in urine left for long time at room temperature, except:

- A. Cell lysis occurs
- B. Bilirubin is oxidized
- C. Formation of uric acid deposits
- D. Glucose increases

42. The following are types of urine samples, except

- A. Blood extracted urine
- B. Clean catch urine
- C. Catheter urine
- D. Suprapubic urine

43. Which of the following positive tests cannot indicate UTI in urinalysis

- A. WBC esterase
- B. Pyuria
- C. Specific gravity
- D. Nitrite

44. The following are reasons for rejecting laboratory samples before analysis, except:

- A. Unlabeled specimen
- B. Specimen collected in wrong collection tube
- C. Hemolysis
- D. Sample collected by other laboratory personnel

45. Site for blood collection for serology, except:

- A. Antecubital fossa
- B. Median cubital vein
- C. Heel capillary puncture
- D. Jugular vein of supine

46. When the kidneys are not functioning properly to filter blood and rid the body of wastes which of these test results would be most likely?

- A. GFR = 100 mL/min
- B. High blood creatinine
- C. High blood albumin
- D. Low blood urea nitrogen

47. What would be the value of 150 mg/dL glucose reported in SI units?

- A. 1.61 mmol/L
- B. 8.25 mmol/L
- C. 0.367 mmol/l

D. None of the above values

48. How should a laboratory verify the reference range it uses for a particular test?

- A. Call another laboratory
- B. Use the numbers from a textbook
- C. Test samples from healthy people
- D. Look on medical internet site

49. What type of additive is in a blood collection tube with a red cap?

- A. Lithium or sodium heparin
- B. Potassium EDTA
- C. Thrombin
- D. No additive

50. Which of the following tests is the best monitor of diabetic glucose control over an 8–12 week period?

- A. Glucose
- B. Urine microalbumin
- C. Hemoglobin A1c
- D. Haptoglobin



**SECTION B: SHORT ANSWER QUESTIONS (SAQS) 30 Marks**

**INSTRUCTION: Answer ALL questions**

1. Describe the composition of blood (5 marks)
2. Describe how prostaglandin I<sub>2</sub> prevents excessive platelet aggregation (5 marks)
3. State any FIVE commonly used anticoagulants and their mode of action (5 marks)
4. Describe the functions of thrombocytes (5 marks)
5. State any FIVE reasons for reticulocytes count analysis in the laboratory (5 marks)
6. State any FIVE functional tests (5mks)

**SECTION C: LONG ANSWER QUESTIONS (LAQS)**

**20 Marks**

**INSTRUCTION: Answer any ONE question**

1. Discuss Hodgkin's lymphoma (20 Marks)
2. Discuss the main clinical disorders of acid-base, fluid and electrolyte imbalances (20 marks)