



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCES  
DEPARTMENT OF NURSING AND MIDWIFERY SCIENCES  
KENYA REGISTERED COMMUNITY HEALTH NURSING  
END OF SEMESTER EXAMINATIONS**

**BSN 221: CLINICAL CHEMISTRY & HAEMATOLOGY (MAIN PAPER)**

**DATE: 29<sup>TH</sup> November 2022**

**TIME: 2 Hours                      Start: 1400 HOURS                      Finish: 1600 HOURS**

**INSTRUCTIONS**

- 1. This exam will be marked out of 70 Marks**
- 2. ALL Questions are compulsory.**
- 3. The Examination has 20 Multiple Choice Questions, 30 Short Answer Questions and 20 Marks Long Answer Questions**
- 4. Answer all Questions in the ANSWER BOOKLET provided**

**SECTION A. MULTIPLE CHOICE QUESTIONS (MCQs)-20 MARKS**

1. Select the anticoagulant of choice for blood gas studies.
  - A. Sodium citrate 3.2%
  - B. Lithium heparin 100 U/mL blood
  - C. Sodium citrate 3.8%
  - D. Ammonium oxalate 5.0%
  
2. The following conditions is associated with hypokalemia:-
  - A. Addison's disease
  - B. Hemolytic anemia
  - C. Digoxin intoxication
  - D. Alkalosis
  
3. The following conditions is associated with total body sodium excess:-
  - A. Renal failure
  - B. Hyperthyroidism
  - C. Hypoparathyroidism
  - D. Diabetic ketoacidosis
  
4. Select the most appropriate adult reference range for fasting blood glucose.
  - A. 40–105 mg/dL (2.22–5.82 mmol/L)
  - B. 60–140 mg/dL (3.33–7.77 mmol/L)
  - C. 65–99 mg/dL (3.61–5.50 mmol/L)
  - D. 75–150 mg/dL (4.16–8.32 mmol/L)
  
5. A statement that is true regarding the metabolism of bilirubin is:-
  - A. It is formed by hydrolysis of the methane bridge of urobilinogen
  - B. It is reduced to biliverdin prior to excretion
  - C. It is a by-product of porphyrin production
  - D. It is produced from the destruction of RBCs

6. Urea is produced from:

- A. The catabolism of proteins and amino acids
- B. Oxidation of purines
- C. Oxidation of pyrimidines
- D. The breakdown of complex carbohydrates

7. A true statement regarding transaminases is:-

- A. ALT is often increased in muscular disease, pancreatitis, and lymphoma
- B. ALT is increased in infectious mononucleosis, but AST is usually normal
- C. ALT is far more specific for liver diseases than is AST
- D. Substrate depletion seldom occurs in assays of serum from hepatitis cases

8. Treatment recommendations for patients with coronary heart disease are based upon measurement of:-

- A. HDL cholesterol
- B. VDL cholesterol
- C. LDL cholesterol
- D. Total cholesterol

9. The preservative added to urine for biochemical analysis:-

- A. Hydrochloric acid
- B. Toluene
- C. Formalin
- D. Thymol

10. The enzymes that is considered most tissue specific is:-

- A. Creatine kinase (CK)

- B. Amylase
- C. Alkaline phosphatase (ALP)
- D. Alcohol dehydrogenase (ADH)

11. One of the following is a characteristic of classic hemophilia A:-

- A. Prolonged bleeding time
- B. Autosomal recessive inheritance
- C. Mild to severe bleeding episodes
- D. Prolonged PT

12. The anticoagulant of choice for most routine coagulation studies is:

- A. Sodium oxalate
- B. Sodium citrate
- C. Heparin
- D. Ethylene-Diamine-Tetra-Acetic acid (EDTA)

13. The Anticoagulants and preservatives used in blood collection and storage for blood transfusion

- A. Lithium heparin
- B. Ethylene Diamine Tetra-Acetic Acid (EDTA) liquid
- C. Sodium citrate
- D. Citrate phosphate dextrose adenine

14. All of the following factors may influence the erythrocyte sedimentation rate (ESR) *except*:

- A. Blood drawn into a sodium citrate tube
- B. Anisocytosis, poikilocytosis
- C. Plasma proteins
- D. Caliber of the tube

15. One the following initiates in vivo coagulation by activation of factor VII?

- A. Protein C

- B. Tissue factor
- C. Plasmin activator
- D. Thrombomodulin

16. The most commonly used blood grouping system is:

- A. Lewis blood grouping system
- B. MNs blood grouping system
- C. Kell blood grouping system
- D. ABO blood grouping system

17. The following test results is normal in a patient with classic von Willebrand's disease?

- A. Bleeding time
- B. Activated partial thromboplastin time
- C. Platelet count
- D. Factor VIII:C and von Willebrand's factor (VWF) levels

18. \_\_\_\_\_ is considered a normal hemoglobin:-

- A. Carboxyhemoglobin
- B. Methemoglobin
- C. Sulfhemoglobin
- D. Deoxyhemoglobin

19. Features of secondary polycythemia include all of the following *except*:

- A. Splenomegaly
- B. Decreased oxygen saturation
- C. Increased red cell mass
- D. Increased erythropoietin

20. Sick cell disorders are:

- A. Hereditary, intracorpuscular RBC defects

- B. Hereditary, extracorporeal RBC defects
- C. Acquired, intracorporeal RBC defects
- D. Acquired, extracorporeal RBC defects

**SECTION B. SHORT ANSWER QUESTIONS- (30 MARKS)**

1. Describe the reactions which may occur to a patient during or Immediately after blood transfusion. (5 Marks)
2. Using well illustrated diagram, give the stages of Erythropoiesis. (5 marks)
3. Describe the following Red blood cell indices and for each give their normal Range. (4 marks)
  - (i) Mean corpuscular haemoglobin concentration (MCHC):
  - (ii) Mean corpuscular volume (MCV):
  - (iii) Red Cell Distribution Width (RDW)
  - (iv) Mean corpuscular haemoglobin (MCH):
4. Outline the types of plasma proteins. (5 marks)
5. Describe briefly the following terms as used in Carbohydrates Metabolism (4 marks)
  - (i) Gluconeogenesis
  - (ii) Glycogenesis
6. Discuss the Clinical applications for Liver Function Tests. (4 Marks)
7. Outline the importance for studying Clinical Chemistry in regard to patient Management. (3 Marks)

**SECTION C. LONG ANSWER QUESTIONS- (20 MARKS)**

1. Describe FIVE factors that determine blood glucose level in the body (10 marks)
2. Discuss the inherited disorders of blood coagulation (10 marks)