



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
END OF SEMESTER AUGUST 2026 EXAMINATIONS**

BSN 221: Clinical Chemistry & Haematology (Main Examination)

DATE: 3RD AUGUST 2026

Duration: 2 HOURS

Start: 9AM

Finish: 11AM

INSTRUCTIONS

1. This exam is out of 70 marks
2. This Examination comprises THREE Sections. Section A: Multiple Choice Questions (20 marks)
Section B: Short Answer Questions (30 marks) and Section C: Long Answer Questions (20 marks)
3. Answer ALL Questions.
4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Which specimen is most suitable for fasting blood glucose analysis?
 - A. Whole blood
 - B. Serum or plasma
 - C. Urine
 - D. Cerebrospinal fluid
2. The enzyme predominantly elevated in acute pancreatitis is:
 - A. AST
 - B. ALT
 - C. Lipase
 - D. ALP
3. Metabolic acidosis is commonly associated with:
 - A. Diabetes ketoacidosis
 - B. Vomiting
 - C. Hyperventilation
 - D. Excess antacid use
4. Which electrolyte is the major extracellular cation?
 - A. Potassium
 - B. Calcium
 - C. Sodium
 - D. Magnesium
5. Albumin is synthesized mainly in the:
 - A. Kidney
 - B. Bone marrow
 - C. Liver
 - D. Pancreas
6. Polycythemia refers to an increase in:
 - A. White blood cells
 - B. Platelets
 - C. Plasma proteins
 - D. Red blood cells
7. The laboratory test used to estimate the percentage of red blood cells in blood is:
 - A. ESR
 - B. Hematocrit
 - C. Reticulocyte count
 - D. Platelet count
8. Which blood disorder is characterized by defective clotting factor VIII?
 - A. Leukemia
 - B. Hemophilia A
 - C. Thalassemia
 - D. Aplastic anemia
9. Reticulocytes are:
 - A. Mature white blood cells
 - B. Immature red blood cells
 - C. Fragmented platelets
 - D. Plasma proteins
10. A prolonged bleeding time commonly indicates a disorder of:
 - A. Platelets
 - B. Red blood cells

- C. Hemoglobin
 - D. Plasma glucose
11. The universal recipient blood group is:
- A. O negative
 - B. A positive
 - C. AB positive
 - D. B negative
12. Before blood transfusion, compatibility testing is performed to prevent:
- A. Hypoglycemia
 - B. Hemolytic reactions
 - C. Electrolyte imbalance
 - D. Dehydration
13. Which blood component is mainly administered to patients with thrombocytopenia?
- A. Packed red cells
 - B. Whole blood
 - C. Platelet concentrates
 - D. Fresh frozen plasma
14. Elevated blood urea levels may indicate impaired:
- A. Liver function
 - B. Kidney function
 - C. Thyroid function
 - D. Pancreatic function
15. Hypoglycemia refers to:
- A. Increased blood glucose
 - B. Reduced blood glucose
 - C. Increased blood pressure
 - D. Reduced calcium levels
16. The anticoagulant found naturally in the body that prevents excessive clotting is:
- A. Heparin
 - B. EDTA
 - C. Citrate
 - D. Oxalate
17. Sickle cell disease results from an abnormality in:
- A. Plasma proteins
 - B. Platelets
 - C. Hemoglobin structure
 - D. White blood cells
18. Elevated erythrocyte sedimentation rate (ESR) commonly suggests:
- A. Inflammation
 - B. Dehydration
 - C. Hypoglycemia
 - D. Polycythemia
19. Fresh frozen plasma is mainly used to replace:
- A. Iron stores
 - B. Clotting factors
 - C. White blood cells
 - D. Hemoglobin
20. Which condition is commonly associated with jaundice and elevated unconjugated bilirubin?
- A. Hemolytic anemia
 - B. Diabetes mellitus
 - C. Hypertension
 - D. Asthma

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SECTION B: SHORT ANSWER QUESTIONS (30 MARKS)

1. Explain the clinical significance of the following tests: (6 marks)
 - i. Serum creatinine
 - ii. Alanine aminotransferase (ALT)
 - iii. Blood glucose
2. Briefly describe electrolyte imbalance involving sodium, potassium and chloride. (6 marks)
3. Explain the anemia that results from Vitamin B12 and folic acid deficiency . (6 marks)
4. Explain any three (3) types of leukemia. (6 marks)
5. Highlight the procedures followed when handling blood transfusion reaction. (6 marks)

SECTION C: LONG ANSWER QUESTIONS (20 MARKS)

1. A 60-year-old patient presents with excessive thirst, frequent urination, fatigue, and unexplained weight loss. Laboratory investigations reveal elevated fasting blood glucose and increased HbA1c levels. Discuss the biochemical basis of this condition, the laboratory tests used in diagnosis, and the importance of monitoring biochemical parameters during management. (10 marks)
2. Discuss the organization of blood transfusion services in Kenya (10 marks)