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University Examinations 2024/2025

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL LABORATORY SCIENCES

HMU 3216: CLINICAL CHEMISTRY

DATE: JANUARY 2025 **TIME: 3 HOURS**

INSTRUCTIONS:
Answer ***All*** *questions*
Ensure that all your answers are properly numbered
Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark
Part II: Short Answer Questions – Answer questions following each other on the answer booklet
Part III: Long Answer Questions – Answer each question on the answer booklet

SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)

1. A patient had a specimen drawn for iron determination at 8am and another drawn for the same test at 4pm. The results were higher in the am than the pm. This is an example of which of the following
   a. Delta check
   b. Physiological variation
   c. Diurnal variation
   d. Critical value alert
2. Occult blood can be used to diagnose the following medical condition
   a. Indigestion
   b. Malabsorption

c. Peptic ulcer

d. Nephritic syndrome

3. Which of the following condition causes jaundice

   a. Anaemia

   b. High levels of white blood cells

   c. Fungal infection

   d. Lack of vitamin B complex

4. The following equation is associated with Beer-lambert's law

   a. A=2-LOG%T

   b. A=log%T-2

   c. A=2=%T

   d. A=OD-2log%T

5. What is the purpose of a cuvette in spectrophotometric analysis

   a. Source of heat

   b. Source of electricity

   c. Measures the amount of light absorbed

   d. Holds the solution to be measured

6. What is the standard international unit for blood glucose

   a. Mg/l

   b. g/l

   c. U/L

   d. Mmol/l

7. Which of the following is a kidney function test

   a. Serum calcium levels

   b. Serum bilirubin levels

   c. Serum creatinine levels

   d. Serum magnesium levels

8. Uric acid is a by-product of

   a. Haemoglobin metabolism

   b. Protein metabolism

c. Purine metabolism

d. Muscle metabolism

9. Which of the following is a mandatory pre-operative test

a. Serum magnesium

b. Serum potassium

c. Serum bilirubin

d. Serum proteins

10. Severe gastro-enteris causes

a. Hypokalemia

b. Jaundice

c. Volume overload

d. Anaemia

11. Creatinine clearance test measures

a. Functional capacity of the kidney

b. Liver function capacity

c. Rate of creatinine formation

d. Rate of urea formation

12. Which of the following anticoagulant is ideal for CSF biochemistry

a. EDTA

b. Heparin

c. Fluoride

d. Sodium citrate

13. The following are liver function tests EXCEPT

a. Total bilirubin

b. Aspartate transaminase

c. Creatine kinase

d. Alkaline phosphatase

14. Oral glucose tolerance test requires the patient to fast for

a. 8-12 hours

b. 5-10 hours

c. 12-24 hours

d. 7-10 hours

15. Urea is a by-product of

a. Hormone metabolism

b. Red blood cell breakdown

c. Protein metabolism

d. Cholesterol metabolism

16. Which of the following component is not normally found in the glomerular filtrate

a. Red blood cells

b. Glucose

c. Urea

d. Calcium

17. Serum sodium can be measured in the laboratory by use of the following principle

a. Chromatography

b. Electrophoresis

c. Ion selective electrode

d. Polarization

18. In bacterial meningitis, CSF glucose is usually

a. Elevated

b. Within normal reference ranges

c. Reduced

d. Not measured

19. Excessive loss of albumin in urine is known as

a. Nephrotic syndrome

b. Hepatorenomegally

c. Septic shock

d. Renal tubular acidosis

20. Where is albumin synthesized in the body

a. Kidney

b. Pancreas

c. Spleen

d. Liver

SECTION B: SHORT ANSWER ALL QUESTIONS (40 MARKS)

1. Outline differential diagnosis of pre-hepatic, hepatic and post hepatic jaundice (5 marks)
2. State five function of the kidney (5 marks)
3. Tabulate five differences between diabetes mellitus type 1 and diabetes mellitus type 2 (5 marks)
4. Describe how you would perform an oral glucose tolerance test on a pregnant woman patient (5 marks)
5. Using the following laboratory report, calculate the low density lipoprotein cholesterol and comment on the report. (total cholesterol= 6.5mmol/l, trglyceride=1.1mmol/L, high density lipoprotein cholesterol= 1.6 mmol/L) (5marks)
6. List down five factors considered in choosing the best instrument for analytical purposes (5 marks)
7. Briefly describe how the body responds to oversupply and short supply of glucose (5 marks)
8. Describe how you would prepare urine container for a 24 hour creatinine clearance test (5 marks)

SECTION C: LONG ANSWER TWO QUESTIONS (40 MARKS)

1.Using the laboratory report given below, Calculate (a) creatinine clearance (b) corrected creatinine clearance of a 17 year old female patient attending radiotherapy clinic in Kenyatta national hospital.

24 Hrs urine volume = 1,850ml

Urine creatinine = 9,510 gmol/l

Serum creatinine = 105 umol/l

Patient's body surface area = 1.58m^2

Average person surface area = 1.73 m^2

2. Discuss quality assurance in clinical chemistry laboratory (20 marks)

3. Discuss in details the causes and assessment of female infertility (20 marks)