



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR:

DMLS

AML 2210: CLINICAL CHEMISTRY II.

END OF SEMESTER EXAMINATION

SERIES: AUG 2019

TIME: 2 HOURS

DATE:

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of sections A and B. Attempt all sections.

Circle the correct answer in section A.

Section A (40 Marks)

1. What product is yielded when glucose is oxidized in the presence of glucose-oxidase?
 - A. Glucuronic acid
 - B. Maltose
 - C. Hydrogen peroxide
 - D. Pyruvate

2. What chemical can be used to detect phenyl pyruvic acid in urine?
 - A. 10% Trichloroacetic acid
 - B. 10% Hydrochloric acid
 - C. 10% Ferric chloride
 - D. 10% ferric hydroxide

3. Which one is a characteristic of conjugated bilirubin?
 - A. Protein bound
 - B. Soluble in water
 - C. Found free in plasma
 - D. Indirect bilirubin

4. What terminology is given for a decrease in volume of excreted urine ?
 - A. Oliguria
 - B. Polyuria
 - C. Anuria
 - D. Voluria

5. Which of the following crystals can be found in urine at acidic pH?
 - A. Calcium Carbonate
 - B. Uric Acid
 - C. Ammonium Urate
 - D. Amorphous phosphate

6. Which method can be used for quantification of serum protein?
 - A. Electrophoresis
 - B. Benedict alkaline reduction test
 - C. Gmelin's nitric acid ring test
 - D. Biuret's test

7. Which one of the following is a product of Bilirubin coupled to diazonized sulphanilic acid?
 - A. Biliverdin
 - B. Azobilirubin
 - C. Stercobilin
 - D. Urobilin

8. Which one of the following is the renal threshold of glucose?
 - A. 10mg/dl.

- B. 180mg/dl
- C. 100mg/dl
- D. 8mg/dl

9. Which biological process below will result to formation of creatinine as its end product?

- A. Urea formation
- B. Phosphorous metabolism
- C. Muscle breakdown
- D. Phosphocreatinine metabolism

10. The following is true of Albumin in serum protein electrophoresis at pH 8.6:-

- A. Migrates faster among serum proteins
- B. Migrates slowest among serum proteins
- C. Has a positive charge
- D. It is the smallest among the serum protein

11. Which of the following condition is associated with the presence of ketone bodies in urine?

- A. Haemorrhage
- B. Diabetes mellitus
- C. Kidney nephritis
- D. Urinary tract infection

12. Which one of the following can be used as a preservative for 24-hour urine specimen?

- A. Concentrated Hydrochloric acid
- B. Citrate
- C. EDTA
- D. Oxalate

13. Which of the following is directly involved in the formation of stercobinogen?

- A. Phospholipids
- B. Haemoglobin
- C. Bilirubin
- D. Porphobilinogen

14. Which one of the following is not detected by urine dip strip?

- A. Leucocytes
- B. Blood

- C. Platelets
- D. Protein

15. Presence of protein in urine can be indicative of the following?
 - A. Reduced specific gravity
 - B. Suggestion for Hay's test
 - C. Renal disorders
 - D. Endocrinal disorders
16. The following is associated with the amount of urine excreted:-
 - A. Glycosuria
 - B. Haematuria
 - C. Oliguria
 - D. Proteinuria
17. Which of the following is a reagent strip used for the detection of protein in urine?
 - A. Ketostix
 - B. Glucostix
 - C. Albustix
 - D. Albutest
18. Which of the following should be in a healthy diet?
 - A. Complex carbohydrates
 - B. Lots of fats for energy source
 - C. Fructose and sucrose
 - D. High quantities of sucrose
19. The chemical analysis of urine includes the following except:
 - A. pH
 - B. Protein
 - C. Urobilinogen
 - D. Schistosoma haematobium
20. Which of the following is true of glycogen?
 - A. It is the major storage molecule in plants
 - B. It is the major storage molecule in animals

- C. Its structure is similar to that of insulin
 - D. It is tested in the laboratory for the detection of diabetes mellitus
21. Serum electrophoresis separates globulins into the following except:-
- A. Beta
 - B. Gamma
 - C. Alpha
 - D. Delta
22. The following is not a characteristic of the Bence Jones
- A. Made of light chain Immunoglobulins
 - B. Precipitated at 45 degrees
 - C. Precipitated at 65 degrees
 - D. Mostly found in serum of people with multiple myeloma
23. The degree of the body's tolerance to glucose is dependent on:-
- A. Glucose renal threshold
 - B. Rate of glucose absorption
 - C. Urinary glucose concentration
 - D. Insulin response
24. In which situation is oral glucose tolerant test suggested to be performed on a patient?
- A. In Diabetic patients
 - B. When fasting blood glucose value is above the normal
 - C. When the random blood glucose value is normal
 - D. When the patients looks obese
25. Which of the following is NOT a renal function parameter?
- A. Blood urea nitrogen
 - B. Potassium
 - C. Lipase
 - D. Creatinine
26. Which of the following is the latest analytical method for electrolyte estimation?
- A. Flame photometry
 - B. Antigen /Antibody
 - C. Ion selective electrodes

D. Agglutination

27. Serum sodium concentration of 100mmol/l refers to a condition known as:-
A. Normal
B. Hyponatraemia
C. Hypernatraemia
D. Hyperkalaemia
28. Icteric refers to :-
A. Elevated glucose in a specimen
B. Elevated urea in a specimen
C. Elevated bilirubin in a specimen
D. Elevated calcium in a specimen
29. Haematuria refers to presence of :-
A. Creatinine in urine
B. Stool in urine
C. Blood in urine
D. Hormones in Urine
30. What is the name given to the functional unit of a Kidney?
A. Ureter
B. Tubule
C. Nephron
D. Neuron
31. Which people are affected by the gestational diabetes mellitus ?
A. Everybody
B. All women
C. Some pregnant women
D. Old Women
32. The best anti-coagulant for collection of blood for clinical chemistry analysis is:-
A. EDTA
B. Heparin
C. Citrate

D. Oxalate

33. Which of the following is not a ketone body?
A. Acetone
B. Acetoacetic acid
C. Cystine
D. β -hydroxybutyrate
34. What reaction does potassium hydroxide give in a system?
A. Acidic
B. Alkaline
C. Neutral
D. Amphoteric
35. Which one of the following is an electrolyte of common diagnostic importance?
A. Iron
B. Zinc
C. Potassium
D. Copper
36. Which one of the following is a recommended container for 24 hour urine collection?
A. Conical flask
B. Concentrated HCl container
C. Winchester Quartz bottle
D. Universal bottle
37. Calculate the concentration of blood glucose given that the OD of the test is 0.3, the OD of the standard is 0.6 and the standard glucose concentration is 9.0mmol/l.
A. 18mmol/l
B. 4.5 mmol/l
C. 9.0 mmol/l
D. 6.0 mmol/l
38. Which organ is under investigation when performing the creatinine clearance test?

- A. Heart
- B. Kidney
- C. Liver
- D. Lung

39. Which one of the following analyte is photo sensitive and requires dark storage?

- A. Protein
- B. Bilirubin
- C. Lipids
- D. Oestrogen

40. Which one of the following is a hypoglycemic agent?

- A. Insulin
- B. Glucagon
- C. Cortisol
- D. Epinephrine

SECTION B (60 Marks)

41. Explain the laboratory diagnostic tests for hyperglycaemia.

(20Marks)

42. (a) Briefly discuss the liver function tests (LFTs)

(10 marks)

(b) Briefly describe the analytes on a urinalysis laboratory report. **(10marks)**

43. Write short notes on the following:

(5 marks each)

- (i) Requirements for electrophoresis
- (ii) Causes of elevated serum bilirubin
- (iii) Causes of ketone bodies
- (iv) Bence jones protein