



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Applied & Health
Sciences

DEPARTMENT OF MEDICAL SCIENCES

DIPLOMA IN MEDICAL LABORATORY SCIENCES (DMLS)

AML 2210: CLINICAL CHEMISTRY II

END OF SEMESTER EXAMINATION

SERIES: APRIL 2014

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

Answer **ALL** questions

This paper consists of **SEVEN** printed pages

Question One (Compulsory)

1. The following are not carbohydrates:
 - a) Starch
 - b) Maltose
 - c) Glycogen
 - d) L-glycine

2. The following are the classes of carbohydrates except:
 - a) Saccharides
 - b) Disaccharides
 - c) Monosaccharide
 - d) Polysaccharides

3. The simple sugars are made of:
 - a) 6 carbon atoms
 - b) Can be glucose, sucrose or galactose
 - c) Soluble in non-polar solvents
 - d) They got no stereoisomers

4. The following statements are true:
 - a) Hexokinase action happens in all tissues even in the liver
 - b) The first part of glycolysis happens in aerobic animals only
 - c) Hexokinase is involved in phosphorylation
 - d) Fermentation doesn't happen in oxygen depletion states i.e anaerobic conditions

5. The following statement is untrue:
 - a) Glucose + fructose \rightarrow sucrose
 - b) Lactose \rightarrow Glucose + Glucose
 - c) If anomeric carbon is involved in a glycosidic linkage then the sugar is non-reducing
 - d) Starch is the storage form of carbohydrates in plants

6. The following is obtained in glycolysis if oxygen is not supplied:
 - a) Lactate
 - b) Glucose – 6 – phosphate
 - c) Pyruvate
 - d) Pentose

7. The following are qualitative test that can confirm some reducing sugars except:
 - a) Methylamine test
 - b) Seliwanoff's test
 - c) Osazone test
 - d) Reagent tip strip

8. Gluconeogenesis involves formation of glucose from the following:
 - a) Pyruvate
 - b) Malate
 - c) Glucogenic amino acid

- d) Oxaloacetate
9. Why do we use specific types of anticoagulants in blood collected when doing OGTT
- To stop glycolysis
 - To avoid interference of particles
 - To increase agility of cells
 - To raise the level of glucose concentration
10. What is the renal threshold of glucose in human:
- 180mg/l
 - 10mg/dl
 - 10mmol/l
 - 180mmol/l
11. The following are pentoses except:
- Riboses
 - De-oxy sugars
 - Xylose
 - Arabinose
12. Reducing substances include the following except:
- Pentoses
 - Glucose
 - Uric acid
 - Oxalocetate
13. What is the suitable container for good random urine sample:
- Winchester quartz bottle
 - Universal bottle
 - Bijuu' bottle
 - Poly pot
14. Urinary diastase is rarely found in high levels:
- Suppurative parotitis
 - Mumps
 - Pyelonephritis
 - Pancreatitis
15. Detection of chloride in urine using silver nitrate is base on:
- Assimilation of chlorides
 - Adsorption of chlorides
 - Precipitation of chlorides
 - Reduction of chloride
16. Rupture of lymphatic ducts that drain the pacteals is due to a result of..... which consequently urine appear creamy white.
Fill in the blank space:
- Loa loa
 - Candy taking habits
 - Wuchereria bancrofti

d) *Schistosoma haematobium*

17. Which of the following are detectable using urine dip strip:

- a) Amino acids
- b) Leucocytes
- c) Platelets
- d) Sodium ions

18. Presence of proteins in urine can:

- a) Increase specific gravity
- b) Reduce specific gravity
- c) Be detected using hay test
- d) Rarely show renal dysfunction

19. The following are terminologies associated with the amount of urine excreted except:

- a) Oliguria
- b) Polyuria
- c) Proteinuria
- d) Polydypsuria

20. The following urine preservative is best suited for protein analysis in urine samples:

- a) Conc HCL
- b) 10% acetic acid
- c) Refrigeration
- d) Thymol

21. Bicarbonate levels may be affected by a variety of respiratory and metabolic disturbance which include:

- a) Respiratory acidosis
- b) Respiratory alkalosis
- c) Defective conjugation
- d) Pancreatic malfunction

22. Ferric chloride react with phenylpyruvate in urine to product a green colour in which condition:

- a) Alkaptonuria
- b) Phenylketonuria
- c) Proteinuria
- d) Glucosuria

23. Which of the following is an indication of renal tubular defect or UTI when observed in urine except:

- a) Cystein crystals
- b) Triple phosphate crystals
- c) Hyaline casts
- d) Uric acid crystals

24. The main electrolytes which can be tested in the laboratory are:

- a) Fluorine
- b) Potassium
- c) Chromium
- d) Beryllium

25. Over production of bilirubin caused by excessive breakdown of red cells in tropical countries of the unconjugated types is caused by:
- Typhoid injection
 - Severe plasmodium infection
 - Renal failure
 - Brucellosis
26. The following are tests used in the laboratory to determine urea present in blood except:
- Diacetyl monoxime method
 - Urastrat
 - Berthelot
 - Jaffee's reaction
27. Plasma increase of uric acid is associated with:
- Diabetes mellitus
 - Renal failure
 - Gout
 - Amenorrhea
28. What causes uric acid excretion:
- Purine metabolism
 - Muscle breakdown
 - Protein metabolism
 - None of the above
29. Plasma creatinine normal concentration ranges between:
- 15 – 40mg/dl
 - 2.5 – 8.3mmol/l
 - 0.7 – 1.4mmol/l
 - 2.3 – 5.9mmol/l
30. Calculate the Pka of lactic acid given that the concentration of free lactic acid is 0.01m and the concentration of lactate of 0.087m, the pH being 4.8.
- 3.86
 - 1
 - 0.42
 - None of the above
31. What is insulin:
- An enzyme
 - A hormone
 - A hyperglycemia agent
 - A hypoglycemia agent
32. The following are fat-soluble vitamins:
- A
 - B₆
 - C

d) B₁₂

33. 40ml of 80mg/dl glucose standard is diluted to one litre, the resulting solution would be:

- a) 32mg/dl
- b) 3.2mg/dl
- c) 3.2mg/l
- d) 50mg/dl

34. Soluble bilirubin is:

- a) Non toxic
- b) Unconjugated
- c) Bound to albumin
- d) Free in plasma

35. Bilirubin coupled to diazotized sulphanilic acid produces:

- a) Azobilirubin
- b) Biliverdin
- c) Green colour
- d) Yellow colour

36. Renal threshold of glucose is:

- a) 10mg/dl
- b) 10mmol/l
- c) 180mmol/l
- d) 18mmol/l

37. Creatinine is an end product of:

- a) Urea formation
- b) Phosphorous metabolism
- c) Muscles breakdown
- d) Protein metabolism

38. Which of the following has the highest anodal migration in a serum protein electrophoresis at pH 8.6:

- a) γ - globulin
- b) Albumin
- c) β globulin
- d) None of the above

39. In berthelot reaction, sodium nitroprusside is used as:-

- a) Diluent
- b) Buffer
- c) Catalyst
- d) All of the above

40. The following are ketonebodies except:

- a) Phenylketones
- b) Hydroxybutyrate
- c) Aceto acetate
- d) Acetone

SECTION B – 60 MARKS

Question One

- a) Describe the possible tests you can perform in a clinical chemistry laboratory on a patient suspected to renal disorders. **(10 marks)**
- b) Comment on the urine preservatives **(10 marks)**
- c) Suggest the possible causes for the following observed in a morning mid-stream urine:
Ketones - +++
Nitrites - ++
Glucose - ++ **(5 marks)**

Question Two

- a) Explain why newborn babies usually excrete a greenish yellow stool. **(3 marks)**
- b) Describe the principle behind Zouche's test. **(5 marks)**
- c) Using a well illustrated flow schematic diagram, show how bilirubin is derived until it is excreted in faeces or urine **(7 marks)**
- d) Explain how the clinical laboratory can be involved in diagnosis of liver disorders using serum as the sample. **(10 marks)**
- e) Describe the simple test done in the laboratory to detect presence of bile salts in urine. **(10 marks)**