



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
MEDICAL LABORATORY SCIENCES
BMLS 13M REGULAR

AML 4201 : CLINICAL CHEMISTRY I

SEMESTER EXAMINATION

APRIL 2014 SERIES

2

HOURS

Instructions to candidates:

This paper consists of **TWO** sections **A** and **B**

Section A -Contains MCQS, Answer **ALL** questions in **Section B**.

SECTION A - MCQs - (30marks)

1. Water constitutes the following percentage of body weight
 - a) 80%
 - b) 95%
 - c) 75%
 - d) 60%

2. The most ideal container for random urine specimen is
 - a) 10 litre
 - b) Bijou bottle
 - c) McCartney bottle
 - d) Winchester bottle
 - e) Universal bottle

3. Urine preservatives include the following except
 - a) Boric acid

- b) HNO_3
 - c) Sodium Carbonate
 - d) Concentrated HCL
 - e) Sodium Nitroprosside
4. What is the term given to an increase in urine volume
- a) Anuria
 - b) Renal dysfunction
 - c) Oliguria
 - d) Polyuria
 - e) Retinopathy
5. What is the term given to absence in urinary volume
- a) Anuria
 - b) Renal dysfunction
 - c) Oliguria
 - d) Polyuria
 - e) Retinopathy
6. Which one of the following can be used to determine specific gravity of urine
- a) Refractometer
 - b) Osmometer
 - c) Ion selective electrode analyzer
 - d) Centrifuge
 - e) Micropipette
7. A blood pH of 7.35 would indicate:
- a) Normal
 - b) Acidosis
 - c) Alkalosis
 - d) Neutral
 - e) Extremely alkaline
8. Which of the following would occur from an increased capillary hydrostatic pressure?
- a) Dehydration
 - b) Hypotonic hydration
 - c) Edema
 - d) Diabetes mellitus
 - e) Diabetes insipidus
9. What is the major cation in the ECF?
- a) Chloride
 - b) Sodium
 - c) Bicarbonate
 - d) Potassium
 - e) Zinc chloride
10. Which of the following compartments has the highest proportion water?

- a) Intracellular
- b) Trancellar fluid compartment
- c) Intravascular fluid compartment
- d) Interstitial fluid compartment
- e) None of the above

11. What is the hormone which controls glycogenolysis?

- a) Aldosterone
- b) ADH
- c) Insulin
- d) Glucagon
- e) Growth hormone

12. Match the following with the correct chemical formula

- a) H_2CO_3 = weak acid
- b) Lactic acid = strong acid
- c) Sulphuric acid = Weak acid
- d) Potassium hydroxide = weak base
- e) HCL = Weak acid

13. Metabolic alkalosis is seen in

- a) An increase in rate and depth of breath
- b) A decrease in rate and depth of breath
- c) Excessive administration of sodium bicarbonate
- d) Administration of substances whose metabolism produces H^+
- e) Anaemia

14. The normal range for sodium in blood is

- a) 135 – 145 mmol/L
- b) 3.8 – 5.0mmol/L
- c) 6.8 – 10.0 mmol/L
- d) 5.0 – 6.8mmol/L
- e) 10 – 15mmol/L

15. Which of the following does not provide buffering power of blood

- a) $\text{HCO}_3^-/\text{H}_2\text{CO}_3$
- b) Na^+
- c) Phosphate ions
- d) Plasma proteins
- e) None of the above

16. A blood pH of 7.45 would indicate

- a) Normal
- b) Acidosis
- c) Alkalosis
- d) Neutral
- e) Extreme acidosis

17. Fluid bathing tissue is classified specifically as _____
- Intracellular
 - Extracellular
 - Interstitial
 - Intracascular
 - Intradermal
18. How is it possible for the rate and depth of breathing to affect hydrogen ion concentration in body fluids?
- During increased air exchange, more oxygen is exchanged with body cells binding hydrogen ions
 - During increased respiration over the long term, more hemoglobin is produced thus increasing the buffering of blood
 - During increased respiration over the long term more lactic is produced
 - It is not possible
19. Which of the following is the end product of protein metabolism
- Bilirubin
 - Urea
 - Uric acid
 - Creatinine
 - None of the above
20. Nitroprusside in the Berthelot reaction functions as a
- Buffer
 - Catalyst
 - Substrate
 - Chromogen
 - Electron donor
21. What is the name of the condition of High Na^+ levels in the ECF?
- Hyperkalemia
 - Hypokalemia
 - Hypernatremia
 - Hyponatremia
 - Hyperchloremia
22. The bicarbonates
- Are anions of the intracellular fluids
 - Are anions of extracellular fluid
 - Have a normal plasma range of 150 – 160mmol/L
 - Are cations of the extra cellular fluid
 - None of the above
23. How does alcohol function as a diuretic?
- Alcohol dilutes the blood and thus endows increased urine output
 - Alcohol receptors in the liver sense its presence and trigger a biochemical pathway that increase urine output to rid the body of alcohol

- c) Alcohol inhibits the release of ADH and thus urine output is increased
 - d) Alcohol increases the heart pulse rate which then increases urine output
 - e) None of the above
24. Which body compartment contains the lowest relative amount of water?
- a) Extracellular
 - b) Intracellular
 - c) Plasma
 - d) Transcellular
 - e) None of the above
25. Which of these conditions leads to a severe threatening water loss
- a) Thalassemia
 - b) Diabetes insipidus
 - c) Hyponatraemia
 - d) Coronary heart disease
26. Which of the following is true regarding diabetes mellitus
- a) IDDM is common in persons above 40 years
 - b) NIDDM tends to occur in obese people
 - c) Serum insulin level is absolutely absent in NIDDM
 - d) Serum protein levels are elevated
 - e) None of the above
27. Which of the following is true of insulin
- a) Is a protein synthesized by β cells of islets of Langerhans
 - b) Secretion is stimulated by dietary protein
 - c) Increases gluconeogenesis in liver
 - d) Increases glycogenolysis in liver
 - e) Is an enzyme
28. Which of the following conditions is associated with pre-renal elevated urea levels
- a) Severe diarrhea
 - b) Jaundice
 - c) Acute glomerulonephritis
 - d) Nephrotic syndrome
 - e) Renal tumours
29. Which of the following disease conditions is associated with elevated blood uric acid levels
- a) Diabetes
 - b) Gout
 - c) Malaria
 - d) Syphilis
 - e) Anaemia
30. Casts are formed
- a) If urine is left to stand for long
 - b) In the urinary bladder

- c) In renal tubules
- d) In the liver
- e) In liver dysfunction

SECTION B ESSAY
(ANSWER ALL QUESTION IN THIS SECTION)

1. (a) Describe the disease conditions associated with pre-renal increases in blood urea **(10 marks)**
- (b) Describe respiratory alkalosis and metabolic alkalosis **(10 marks)**
2. (a) Describe the imbalances associated with Na⁺ in blood **(10 marks)**
- (b) Describe the oral glucose tolerance test **(10 marks)**