



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya

Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,

Website: info@must.ac.ke Email: info@must.ac.ke

University Examinations 2023/2024

THIRD YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN MEDICAL LABORATORY

HML 3322: CLINICAL CHEMISTRY

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS:

- (i) The paper consists of **Three** Sections
- (ii) Section A: Multiple Choice Questions
- (iii) Section B: Short Answer Questions
- (iv) Section C: Long Answer Questions

SECTION A: MCQ - (20 MARKS) - ATTEMPT ALL QUESTIONS

1. The most metabolically active organ in the body is
 - a) Kidney
 - b) Liver
 - c) Pancreas
 - d) All of the above
2. All of the following are functions of the liver, except
 - a) Uptake, storage, metabolism and release of nutrients
 - b) Synthesis of bile salts from cholesterol and their secretion to assist with fat absorption and digestion.
 - c) Synthesis and secretion of plasma proteins necessary for blood clotting
 - d) Formation of urine

3. In which of the following liver diseases the liver itself is normal and the condition is usually harmless.
 - a) Wilson's disease
 - b) Gilbert's disease
 - c) Glycogen storage disease type II
 - d) Non- alcoholic fatty liver disease
4. The typical serum bilirubin pattern of pre-hepatic hyperbilirubinemia is
 - a) increased unconjugated and conjugated bilirubin
 - b) Increased unconjugated bilirubin and normal conjugated bilirubin.
 - c) increased conjugated bilirubin but normal unconjugated bilirubin
 - d) increased conjugated bilirubin but decreased unconjugated bilirubin
5. Which are most susceptible cells to dehydration
 - a) Red blood cells
 - b) Brain cells
 - c) Leucocytes
 - d) Platelets
6. Following are strong electrolytes, except
 - a) HCl
 - b) H_2SO_4
 - c) NaOH
 - d) H_2CO_3
7. The principle cation in plasma is
 - a) sodium
 - b) chloride
 - c) potassium
 - d) calcium
8. Hyponatremia refers to
 - a) Increased plasma sodium concentration
 - b) Decreased plasma sodium concentration
 - c) Decreased plasma potassium concentration
 - d) Increased plasma potassium concentration

9. Following are primary regulators of calcium and phosphorus in the body except
- Parathyroid hormone
 - Calcitonin
 - Vitamin D and its metabolites
 - Luteinizing hormone
10. Oliguria refers to
- Reduce urine output
 - total suppression of urine output
 - increased urine output
 - none of the above
11. Following are tests carried out in clinical chemistry laboratory to investigate the functioning of the kidney, except
- Urea
 - Creatinine
 - Urea
 - Gamma GT
12. Uric acid is measured to confirm diagnosis and monitor treatment of
- Kidney
 - Gout
 - Liver
 - Pancreas
13. Purines are converted into uric acid, primarily in the
- Liver
 - Spleen
 - Kidney
 - Stomach
14. When plasma creatinine concentration is elevated glomerular filtration rate is
- increased
 - decreased
 - normal
 - none of the above

15. Plasma urea concentration is decreased during late pregnancy and in infancy as a result of
- Increased protein synthesis.
 - Decreased protein synthesis
 - Norma protein synthesis
 - None of the above
16. An elevated concentration of urea in the blood is called
- Uremia
 - Azotemia.
 - Hyperuremia
 - Hyporuremia
17. Adrenocorticotrophic hormone
- Stimulates secretion of thyroid hormone
 - Stimulates secretion of glucocorticoids
 - Stimulates milk ejection and uterine contractions
 - Promotes growth
18. To investigate primary and secondary infertility that affect both male and female the following diagnostic parameters are carried out, except
- Testosterone
 - Follicle stimulating hormone
 - 4 Luteinizing hormone
 - Estrodiol 5 hormone
19. Increase in serum levels enzymes indicate
- Decreased enzyme catabolism
 - Accelerated enzyme production
 - Tissue damage and necrosis
 - Increased glomerular filtration rate
20. If the liver disease is primarily of an obstructive nature (cholestatic), which will be the first and foremost enzyme elevation.
- Alanine aminotransferase
 - Aspartate aminotransferase
 - Alkaline phosphatase

- d) All of the above

SECTION B: ANSWER ALL QUESTIONS - (40 MARKS)

1. Briefly describe the distinct processes that take place in each nephron (5 marks)
2. State five factors that affect the optimal function of the kidney (5 marks)
3. State five Sources of errors in enzymatic procedure (5 marks)
4. Outline five applications of laboratory data (5 marks)
5. Explain how liver cirrhosis develops (5 marks)
6. Briefly describe collection and routine examination of cerebrospinal fluid (5 marks)
7. State the principle of HbA1C test (5 marks)
8. Explain the renal threshold for glucose (5 marks)

SECTION C: ANSWER ANY TWO QUESTIONS - (40 MARKS)

1. Discuss the three activities involved in the formation of urine (20 marks)
2. Discuss male and female infertility under the following subheadings (20 marks)
 - a. Causes (12 marks)
 - b. Assessment (8 marks)
3. Discuss pre-hepatic, hepatic and post-hepatic hyperbilirubinaemia (20 marks)