



(University of Choice)

**MASINDEMULIROUNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

**UNIVERSITY MAIN EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**FIRST YEAR, THIRD TRIMESTER EXAMINATION
FOR THE DEGREE OF
BACHEOR OF SCIENCE IN CLINICAL MEDICINE, SURGERY & COMMUNITY
HEALTH**

COURSE CODE: HCM130

COURSE TITLE: MEDICAL BIOCHEMISTRY III

DATE: WEDNESDAY 4TH AUGUST 2021 TIME: 8.00-11.00 AM

INSTRUCTIONS TO CANDIDATES

Answer All Questions

| | |
|---|-----------|
| Section A: Multiple Choice Questions (MCQs) | 20 Marks. |
| Section B: Short Answer Questions (SAQs) | 40 Marks. |
| Section C: Long Answer Question (LAQs) | 40 Marks |

Time: 3 hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over.

Section A: Multiple Choice Questions (MCQs) (20MARKS)

1. **Quantitatively, the most significant buffer system in plasma comprises:**
 - A. Disodium hydrogen phosphate/sodium dihydrogen phosphate
 - B. Carbonic acid-bicarbonate
 - C. Plasma proteins
 - D. Lactic acid-lactate buffer

2. **Which of the following physiological/pathological conditions is most likely to result in an alkaiosis, provided the body could not fully compensate:**
 - A. Production of lactic acid by muscles during exercise
 - B. Production of ketone bodies by a patient with diabetes mellitus
 - C. Repeated vomiting of stomach contents, including HCL
 - D. Diarrhoea with loss of bicarbonate anions secreted into the intestine

3. **A patient with an enteropathy (intestinal disease) produced large amounts of ammonia (NH₃) from bacterial overgrowth in the intestine. The ammonia was absorbed through the intestine into the portal vein and entered the circulation. Which of the following is a likely consequence of his ammonia absorption:**
 - A. A decrease of blood pH
 - B. Conversion of ammonia to ammonium ion in the blood
 - C. Increased expiration of CO₂
 - D. A decreased concentration of bicarbonate in the blood

4. **Chloride shift involves:**
 - A. H⁺ ions leaving the RBCs in exchange of Cl⁻
 - B. Cl⁻ leaving the RBCs in exchange of bicarbonate
 - C. Bicarbonate ion returns to plasma and exchanged with chloride which shifts into the cell
 - D. Carbonic acid to the plasma

5. **Anion gap is the difference in the plasma concentrations of:**
 - A. (Chloride) – (Bicarbonate)
 - B. (Sodium) – (Chloride)
 - C. (Sodium + Potassium) – (Chloride + Bicarbonate)
 - D. (Sum of Cations) – (Sum of Anions)

6. **The isozyme CK-MB is specifically increased in the blood of patients who have:**
 - A. Skeletal muscle disease
 - B. Infective hepatitis
 - C. Myxoedema
 - D. Recent myocardial infarction

7. **Which of the following enzyme is typically elevated in alcoholism:**
 - A. Serum ALP
 - B. Serum GOT

- C. Serum γ -GT
 - D. Serum Acid Phosphatase
8. **The best test for acute pancreatitis in the presence of mumps is:**
- A. A serological test for mumps
 - B. Serum amylase
 - C. Urinary amylase
 - D. Serum lipase
9. **Which of the following is known as bone forming enzyme:**
- A. Acid phosphatase
 - B. Alkaline phosphatase
 - C. Lactate dehydrogenase
 - D. γ -glutamyl transpeptidase
10. **The blood sugar raising action of the hormone of suprarenal cortex is due to:**
- A. Glyconeogenesis
 - B. Glycogenolysis
 - C. Glucagon-like activity
 - D. Inhibition of glomerular filtration of glucose
11. **Mineralocorticoids increase the tubular re-absorption of :**
- A. Sodium and calcium
 - B. Sodium and potassium
 - C. Sodium and chloride
 - D. Potassium and chloride
12. **High levels of T_3 and T_4 and low TSH in serum indicates:**
- A. Hyperthyroidism of pituitary origin
 - B. Hypothyroidism of pituitary origin
 - C. Hyperthyroidism of thyroid origin
 - D. Hypothyroidism of thyroid origin
13. **A characteristic of pheochromocytoma is elevated urinary excretion of:**
- A. Dopamine
 - B. Tyrosine
 - C. Phenylalanine
 - D. Vinylmandelic acid
14. **A high concentration of PTH in blood causes:**
- A. Decrease in plasma calcium and increase in plasma inorganic phosphorous
 - B. Increase in plasma calcium and decrease in plasma inorganic phosphorous
 - C. Increase in plasma calcium and inorganic phosphorous
 - D. Decrease in plasma calcium and inorganic phosphorous
15. **Serum inorganic phosphorous decreases in all the following conditions except:**

- A. Hyperparathyroidism
- B. Intestinal malabsorption
- C. Osteomalacia
- D. Chronic renal failure

16. Hypocalcaemia can occur in all the following except:

- A. Rickets
- B. Osteomalacia
- C. Hyperparathyroidism
- D. Intestinal malabsorption

17. Iron is stored in the form of:

- A. Ferritin and transferrin
- B. Transferrin and haemosiderin
- C. Haemoglobin and myoglobin
- D. Ferritin and haemosiderin

18. In iron deficiency anemia:

- A. The plasma bound iron is high
- B. The plasma bound iron is low
- C. Total iron binding capacity is low
- D. Both the plasma bound iron and total iron binding capacity are low

19. Diets having a high ratio of polyunsaturated: saturated fatty acids can cause:

- A. Increase in serum triglycerides
- B. Decrease in serum HDL
- C. Decrease in serum cholesterol
- D. Skin lesions

20. Action of insulin on lipid metabolism is:

- A. It increases lipolysis and increases triglyceride synthesis
- B. It decreases lipolysis and increases triglyceride synthesis
- C. It decreases lipolysis and decreases triglyceride synthesis
- D. It increases synthesis of triglyceride and increased ketogenesis

Section B: Short Answer Questions (SAQs) (40 MARKS)

1. Briefly explain any five (5) biochemical markers reflecting cardiac tissue damage and myocardial function(10 marks)
2. Using appropriate examples, briefly explain the classification of renal function tests (RFT's)(10 marks)
3. Using suitable examples briefly explain atleast five (5) main clinical parameters utilized in the classification of tumor markers for cancer diagnosis (10 marks)
4. Briefly explain the clinical (biochemical) test parameters and findings (interpretation) of Iron status in disease (10 marks)

Section C: Long Answer Questions (LAQs) (40 MARKS)

1. a) Briefly describe five (5) major factors which regulate renal bicarbonate (HCO_3^-) re-absorption and acid (H^+) excretion (10 marks)
b) Briefly explain any five (5) blood chemistry components of an arterial blood gas analysis (BGA) profile (10 marks)
2. a) List at least five (5) different biochemical analytes that can be measured in cerebrospinal fluid (CSF), while explaining their clinical application/significance(10 marks)
b) Providing relevant examples, briefly perform the classification of liver function tests (LFTs) based on the specific functions of the liver involved(10 marks)

SECTION C
1 A

i) ~~Glomerular~~ GFR

ii) Ammonium

iii) P_{CO_2} .

iv) Extracellular fluid volume

v) Absence of potassium & chloride