



*(University of Choice)*

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)  
UNIVERSITY EXAMINATIONS (MAIN PAPER)  
2023/2024 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DEGREES**

**OF**

**BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES  
BACHELOR OF SCIENCE IN OPTOMETRY AND VISION SCIENCES  
BACHELOR OF SCIENCE IN MEDICAL BIOTECHNOLOGY**

**COURSE CODE: PML 113**

**COURSE TITLE: HUMAN PHYSIOLOGY**

**DATE: 5<sup>TH</sup> DECEMBER 2023**

**TIME: 2.00-4.00PM**

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**INSTRUCTIONS TO CANDIDATES**

This paper is divided into three sections, A B and C, carrying respectively: Multiple Choice Questions (MCQs), Short Answer Questions (SAQs) and Long Answer Questions (LAQs). Answer all questions. **DO NOT WRITE ON THE QUESTION PAPER**

**TIME: 2 Hours**

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

**SECTION A: Multiple Choice Questions (20 Marks)**

1. Name the site where digestion of proteins occurs.
  - A. Pancreas
  - B. Rectum
  - C. Liver
  - D. Ileum
2. Stomach epithelial cells in the body secrete \_\_\_\_\_
  - A. Hydrochloric acid
  - B. Oxytocin
  - C. Adrenaline
  - D. Testosterone
3. Night blindness and xerophthalmia are generally conditions associated with the deficiency of which vitamin?
  - A. Vitamin B
  - B. Vitamin K
  - C. Vitamin B2
  - D. Vitamin A
4. \_\_\_\_\_ are functional units of food absorption.
  - A. Red blood cells
  - B. Small intestine
  - C. Villi
  - D. Aggregated lymphoid nodules
5. Where are the parotid glands located?
  - A. Below the stomach
  - B. Behind and above the pancreas
  - C. Below and in front of the ear canal
  - D. Underneath the armpits
6. The maximum amount of carbon dioxide in the human body is transported as \_\_\_\_\_
  - A. Bicarbonate
  - B. Carbide
  - C. Amylase
  - D. None of the above
7. Which one of the following organisms have book lungs?
  - A. Spider
  - B. Ant
  - C. Penguin
  - D. Sealion
8. Altitude sickness is typically caused due to \_\_\_\_\_
  - A. The partial pressure of oxygen
  - B. Increased levels of CO<sub>2</sub> in blood
  - C. Cold temperatures
  - D. None of the above
9. Hypopnea is a condition where \_\_\_\_\_
  - A. The airway becomes partially obstructed
  - B. The blood does not clot properly
  - C. The lungs cannot eliminate the excess carbon dioxide from the body
  - D. The blood oxygen levels are abnormally low

10. Emphysema is characterized by \_\_\_\_\_
- A. Loss of peripheral vision
  - B. Shortness of breath
  - C. Chronic Diarrhea
  - D. Slow clotting from wounds
11. Humans have \_\_\_\_\_ lobes in the left lung.
- A. 3
  - B. 2
  - C. 4
  - D. 1
12. Jellyfish breathe through \_\_\_\_\_
- A. Book lungs
  - B. Gills
  - C. Diffusion
  - D. None of the above
13. Which one of the following statements is false?
- A. Pituitary Gland is found at the base of the brain
  - B. Adrenal glands are found on top of the kidneys
  - C. Lymph nodes are found only near the neck and armpits
  - D. Thyroid glands are ductless glands
14. The primary function of the cerebrospinal fluid is to \_\_\_\_\_
- A. Protect the brain
  - B. Provide nutrients to the surrounding tissues
  - C. Remove waste products
  - D. All of the above
15. The lungs are protected by \_\_\_\_\_
- A. Sternum
  - B. Rib cage
  - C. Backbone
  - D. All of the above
16. The life span of white blood cells is \_\_\_\_\_
- A. Between 20-30 days
  - B. Between two to three months
  - C. Less than ten days
  - D. 60 days
17. What is the ratio of WBC to RBC in the body?
- A. 1:60
  - B. 1:600
  - C. 1:6000
  - D. 2: 6000
18. Which one of the following is the largest blood vessel in the human body?
- A. Pulmonary vein
  - B. Capillaries
  - C. Aorta
  - D. Superior vena cava
19. Homeostasis
- A. Must always be restored using negative feedback mechanisms
  - B. Provides for the tight regulation of all physiological variables

- C. Is the sum of all chemical reactions in the body
- D. Is a combination of positive and negative feedback mechanisms

20. Some proteins serve as structural element in
- A. hair
  - B. wool
  - C. horn
  - D. all of them

**SECTION B: Short Answer Questions (40 Marks)**

1. Explain the orthodromic neuroconduction event entail (5 Marks)
2. Describe the retroperitoneal region (5 Marks)
3. Describe cell junctions and the functions they perform (5 Marks)
4. Explain mechanisms in the sensation of smell (5 Marks)
5. Outline the importance of the pituitary gland in endocrine regulation (5 Marks)
6. Describe the skeletal muscle contraction mechanisms (5 Marks)
7. Enumerate features of membrane channel pumps and transporters (5 Marks)
8. State the endocrine roles of the thymus gland (5 Marks)

**SECTION C: Long Answer Questions (60 Marks)**

1. Discuss the cascading biochemical events that take place during visual photo transduction (20 Marks)
2. Explain the mitochondrial membrane properties (20 Marks)
3. Explain mechanisms involved in the cardiac electrical conduction system (20 Marks)