



# 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: [www.must.ac.ke](http://www.must.ac.ke) Email: [info@mucst.ac.ke](mailto:info@mucst.ac.ke)

---

## UNIVERSITY EXAMINATIONS 2022/2023

FIRST YEAR, SECOND SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION  
FOR DEGREE OF BACHELOR OF SCIENCE IN NURSING

### NND 3122: MEDICAL PHYSIOLOGY II

DATE: JUNE 2023

TIME: 3 HOURS

---

**INSTRUCTIONS:** *Answer all questions in the booklet provided*

Ensure that all your answers are properly numbered

Section A: Multiple Choice Questions (MCQs): Write the correct answer on the space provided in the answer booklet.

Section B: Short Answer Questions-Answer questions following each other on the answer booklet

section C: Long Answer Questions-Answer the questions on the answer booklet.

---

### SECTION A (MULTIPLE CHOICE QUESTIONS (20 MARKS))

1. Angiotensinogen is:
    - a. A protein produced in the lungs as a precursor of angiotensin I.
    - b. An enzyme produced in the liver for conversion of angiotensin I to angiotensin II.
    - c. A protein in the liver converted in the lungs to angiotensinogen activating enzyme.
    - d. A protein converted to angiotensin I in the liver by angiotensin activating enzyme.
  2. The GIT hormone that inhibits gastric motility and secretion is?
    - a. Cholecystokinin
    - b. Secretin
    - c. Motilin
-

- d. Vasoactive Intestine Peptide
3. The following are necessary for maintaining balance except?
- The Semicircular canals
  - The Vestibules
  - The nephrons
  - Skeletal muscles
4. Sympathetic innervations of the liver regulate?
- Formation of glucose from glycogen
  - Bile synthesis and production
  - Iron storage
  - Endocrine function
5. The vestibulocerebellum may not be involved in?
- Sending impulse to the brain about the speed of the movement of the body
  - Calculate in advance the rates and directions where the different parts will be during the next few milliseconds.
  - Is important in controlling balance between agonist and antagonist muscle contractions during rapid changes in body positions.
  - Is responsible for comparing the intended movements with the actual movements.
6. A \_\_\_\_\_ in plasma glucose will cause an increase in the release of \_\_\_\_\_ from pancreatic \_\_\_\_\_ cells.
- Rise – glucagon – Alpha
  - Drop – insulin – Alpha
  - Rise – insulin – Beta
  - Drop – glucagon – Beta
7. About the myofibril in the skeletal muscle, contractile mechanism depends on the following proteins except?
- Calmodulin
  - Troponin
  - Tropomyosin
  - Actin
8. Following absorption in the GIT, which of the following will not be located in the left subclavian and left internal jugular vein?
- Cholesterol
  - Vitamin A, D, E and K

- c. Monosaccharides
  - d. Amino acids, Di and Tri-peptides
9. Which is true of cardiac muscle
    - a. Cells are multinucleated
    - b. They have more powerful contraction than the smooth muscles
    - c. Are under voluntary control
    - d. Control is achieved by pacemakers
  10. Vitamin B<sub>12</sub> is primary stored by which cells?
    - a. Astrocytes
    - b. Hepatocytes
    - c. Myocytes
    - d. Enterocytes
  11. Which one is not a requirement for the absorption of vitamin B<sub>12</sub>?
    - a. Neutral pH
    - b. Passive mechanism
    - c. Intrinsic factor
    - d. Calcium ions
  12. Primary peristalsis is triggered or initiated by?
    - a. Presence of food in the esophagus
    - b. Swallowing
    - c. Chemical irritants in food
    - d. Myenteric plexus
  13. During fasting periods, the intestines are cleared of their contents which are swept towards the colon. This mechanism is called
    - a. Ileo-colic reflex
    - b. Migrating motor complex
    - c. Defecation reflex
    - d. Gastro-colic reflex
  14. During the defecation reflex, the internal sphincter is controlled by?
    - a. Autonomic nerves
    - b. Somatic nerves
    - c. Autoregulatory mechanisms
    - d. A branch of the sciatic nerve
  15. The action of acetylcholine in the synaptic cleft is terminated by?

- a. Choline acetyltransferase
  - b. Acetylcholinesterase
  - c. Acetylcholine dehydrogenase
  - d. Choline acetyl decarboxylase
16. H<sup>+</sup> ions are taste sensations for which modality?
- a. Sweet
  - b. Sour
  - c. Salty
  - d. Bitter
17. Renin is?
- a. An enzyme produced in the renal tubules in response to high volume of blood through the kidneys.
  - b. An enzyme produced by the convoluted cells in the kidneys in response to low blood volume.
  - c. An enzyme produced by the liver in response to high levels of angiotensin I.
  - d. A hormone produced by the Juxtaglomerular cells in response to low volume of blood in the kidney.
18. The sensory nerve involved in gustatory pathway from the posterior 1/3 of the tongue and pharynx is?
- a. Glossopharyngeal
  - b. Facial
  - c. Olfactory
  - d. Vagus
19. The role of testosterone in males is all of the following except?
- a. Spermatogenesis
  - b. Sexual secondary characteristics
  - c. Growth and development
  - d. Thickening of the endometrium
20. Concerning the skeletal muscle, which statement is not true?
- a. Its plasma membrane is sarcolemma.
  - b. The sarcoplasmic reticulum is the endoplasmic reticulum of skeletal muscle.
  - c. Myofibrils are the contractile unit of the muscle.
  - d. There are syncytial bridges between the cells.

## SECTION B (SHORT ANSWER QUESTIONS (40 MARKS))

1. Describe the Phases of swallowing. (5 Marks)
2. State the Posterior pituitary hormone and their function. (5 Marks)
3. Explain the Effector mechanisms during hypercalcemia. (5 Marks)
4. Write short notes on the mechanisms of the upper gastrointestinal motilities. (5 Marks)
5. Tabulate the differences between the two types of nephrons (5 Marks)
6. Describe the five physiological phases of a neuronal action potential. (5 Marks)
7. Explain the special sense of balance. (5 Marks)
8. Explain general functions of the skeletal system. (5 Marks)

## SECTION C (LONG ANSWER QUESTIONS (40 MARKS))

**Attempt all the Essay questions.**

1. a. Using a diagram, explain the physiology of urination. (10 Marks)  
b. Describe the physiological mechanisms involved in the formation of isotonic urine. (10 Marks)
2. Describe the sliding filament mechanism involved during Excitation-Contraction Coupling in skeletal muscles. (20 Marks)