



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 Email: info@mucst.ac.ke

UNIVERSITY EXAMINATIONS 2022/2023

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

NND 3112: MEDICAL PHYSIOLOGY I

DATE: FEBRUARY 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. Which one is not an example of a feed-forward variable?
 - a. Erection in males
 - b. Salivation on sight of food
 - c. Pre-exercise heart rate
 - d. Defecation
2. When one sweats during exercise it is an example of
 - a. Positive feedback control
 - b. Feed forward control
 - c. Adaptive control

- d. Negative feedback control
3. Factors affecting diffusion across the plasma membrane does not include?
 - a. Steepness of concentration gradient
 - b. Permeability
 - c. Molecular size
 - d. Temperature
 4. Which statement is true of the mitochondria?
 - a. They do not form their own ATP
 - b. They can replicate as they have their own DNA
 - c. Are fixed in the cytoplasm and have no ability to moving outside the cell
 - d. They are used for storage of vitamins especially vitamin A
 5. Smooth endoplasmic reticulum
 - a. Are generally referred to as granular endoplasmic reticulum
 - b. They are found only in the prokaryotic cells
 - c. Main function is to synthesize proteins in the cell
 - d. They are responsible for formation of lipids in the cell
 6. The following are functions of the epithelial tissue except?
 - a. Protection
 - b. Absorption
 - c. Filtration
 - d. Contraction
 7. Which one is true regarding muscular tissue?
 - a. Smooth muscle is mostly under involuntary control
 - b. Skeletal muscle has intercalated discs
 - c. Smooth muscle has striations
 - d. Cardiac muscle is widely distributed in the human body
 8. Cells placed in a hypertonic medium becomes?
 - a. Lysed
 - b. Plasmolysed
 - c. Shriveled
 - d. Turgid
 9. The following organs do not take part in erythropoiesis except?
 - a. Pancreas
 - b. Brain

- c. Kidney
 - d. Heart
10. Which blood cells are not generated via the myeloid pathway?
- a. Granulocytes
 - b. Megakaryocytes
 - c. Monocytes
 - d. Plasma cells
11. Ejection of the nucleus occurs during which stage of erythropoiesis?
- a. Proerythroblast
 - b. Reticulocyte
 - c. Normoblast
 - d. Hemocytoblast
12. With regards to the conduction system of the heart, it is true that?
- a. The cardiac action potential is conducted through the atria via purkinje fibers
 - b. The spread of cardiac excitation speeds up at the AVN
 - c. Between action potentials, cells of the SAN have a stable resting potential
 - d. The purkinje fibers are specialized cardiac muscle linked by gap junctions
13. Type II alveolar pneumocytes
- a. Develop from type I alveolar pneumocytes
 - b. Are macrophagic
 - c. Secrete surfactants
 - d. Are the primary cells lining the alveolar epithelium
14. The exchange of gas between blood and the tissue is called
- a. Ventilation perfusion
 - b. Internal respiration
 - c. External respiration
 - d. Cellular respiration
15. The following statements are true about plasma except?
- a. Red and blood cells are part of plasma
 - b. Carries oxygen and other gases
 - c. Contains various protein including albumin and globulin
 - d. When clotting factors are separated from it, it is called serum
16. Membranes are physical barriers that form part of structural components of cells. Which one of the following is true concerning membranes?

- a. An ideal semi-permeable membrane is permeable to water and impermeable to solutes
 - b. A permeable membrane allows passage of solutes but bars the solvent
 - c. An ideal semi-permeable membrane to solutes but impermeable to water
 - d. A permeable membrane allows passage of solvent but bars the solutes
17. Which one correctly depicts the hierarchical organization of life?
- a. Organisms_species_population_ecosystem_biosphere
 - b. Organisms_population_ecosystem_population_species_biosphere
 - c. Organisms_species_ecosystem_population_biosphere
 - d. Organism_population_species_ecosystem_biosphere
18. Erythropoietic site during the first 3 months of embryonic life would be?
- a. Liver
 - b. Yolk sac
 - c. Spleen
 - d. Bone marrow
19. Identify the incorrect statement about active transport.
- a. Active transport moves substances down their concentration gradient
 - b. Active transport requires energy, usually in the form of ATP
 - c. Active transport is performed by specific proteins embedded in the membranes
 - d. The sodium-potassium pump is one type of active transport system
20. The phrase “cellular eating” is simply?
- a. Pinocytosis
 - b. Phagocytosis
 - c. Receptor-mediated endocytosis
 - d. Exocytosis

SECTION B (SHORT ANSWER QUESTIONS (40 MARKS))

- 1. Describe the signal transduction mechanism. (5 Marks)
- 2. Differentiate between a relay neuron and a motor neuron (5 Marks)
- 3. Describe passive transport mechanisms across the plasma membrane (5 Marks)
- 4. Differentiate between transcription and translation processes during protein synthesis. (5 Marks)
- 5. Explain body fluid distribution (5 Marks)
- 6. Explain the flow of lymph from the source to the heart (5 Marks)

7. Describe the blood flow pathway through the heart. (5 Marks)
8. State five functions of the respiratory system. (5 Marks)

SECTION C (LONG ANSWER QUESTIONS (40 MARKS))

1. Describe the electrical conductivity of the heart. (10 Marks)
2. Explain the structure of the heart (10 Marks)
3. Explain the regulation of the respiratory system (20 Marks)