



**KENYA MEDICAL TRAINING COLLEGE  
FACULTY OF CLINICAL SCIENCES  
DEPARTMENT OF CLINICAL MEDICINE**

**END OF SEMESTER EXAMINATION  
FOR  
MARCH 2021 CLASS – YEAR 1 SEMESTER I**

**PAPER: MEDICAL PHYSIOLOGY I**

**DATE: 2<sup>nd</sup> August, 2021**

**TIME: 2 HOURS (2:00PM – 4:00 PM)**

**INSTRUCTIONS**

1. This paper consists of:
  - Section 1 (20 Multiple Choice Questions)
  - Section 2 (4 Short Answer Questions)
  - Section 3 (2 Long Answer Question)
2. Attempt **ALL** Questions
3. Write your **ADMISSION NUMBER** on all the answer sheets provided and on the question paper.
4. Ensure that all examination answer scripts are handed in at the end of the examination
5. Ensure you sign in the 'sign IN and OUT' examination register provided

EXAMINATION NUMBER .....

**Section 1 (20 Multiple Choice Questions) (20 Marks)**

1. The cell membrane structure is made up of the following except:
  - a) Phospholipids
  - b) Cholesterol
  - c) Proteins
  - d) Glycoproteins
2. Which of the following is not a component of the DNA nucleotide chain?
  - a) Adenine
  - b) Guanine
  - c) Uracil
  - d) Cytosine
3. Transcription refers to
  - a) The process where an mRNA is used as a template for protein production.
  - b) The process where a DNA sequence is copied into mRNA for the purpose of gene expression.
  - c) The process where DNA wraps around histones to form a nucleosome.
  - d) The process of replication of DNA prior to cell division.
4. Fill in the blanks: Glycogen is a storage form of glucose. \_\_\_\_\_ refers to the process of making glycogen and \_\_\_\_\_ refers to the process of breakdown of glycogen.
  - a) glycogenolysis, glycogenesis
  - b) glycolysis, glycogenolysis
  - c) glycogenesis, glycogenolysis
  - d) glycogenolysis, glycolysis
5. Endocytosis
  - a) Includes phagocytosis and pinocytosis, but not clathrin-mediated uptake of extracellular contents.
  - b) Refers to the merging of an intracellular vesicle with the plasma membrane to deliver intracellular contents to the extracellular milieu.
  - c) Refers to the invagination of the plasma membrane to uptake extracellular contents into the cell.
  - d) Refers to vesicular trafficking between Golgi stacks.
6. Cell membranes
  - a) Contain relatively few protein molecules.
  - b) Contain many carbohydrate molecules.
  - c) Are freely permeable to electrolytes but not to proteins.
  - d) Have variable protein and lipid contents depending on their location in the cell.
7. The Golgi complex is;
  - a) An organelle that participates in the breakdown of proteins and lipids.
  - b) An organelle that participates in processing and packaging of proteins.
  - c) An organelle that participates in energy production.
  - d) A subcellular compartment that stores proteins for trafficking to the nucleus.
8. Which of the following substances creates the osmotic pressure of blood?
  - a) Creatinine

- b) Uric acid
- c) Plasma proteins
- d) Sodium

9. Which of the following cells is found in blood?

- a) Erythroblast
- b) Proerythroblast
- c) Reticulocyte
- d) Erythrocyte

10. The following factors increase release of oxygen from oxyhemoglobin except;

- a) Low pH
- b) Hypoxia
- c) Blood pressure
- d) High temperature

11. Which of these cells is not a granulocyte?

- a) Eosinophils
- b) Lymphocytes
- c) Neutrophils
- d) Basophils

12. Which one is a cell of the reticuloendothelial system?

- a) Kupffer cells
- b) Monocytes
- c) Interleukin
- d) Thymus

13. The thoracic duct drains lymph from;

- a) Abdominal cavity
- b) Right half of the thorax
- c) The right arm
- d) The left lower limb

14. Ciliated columnar epithelium is found in the;

- a) Fallopian tubes
- b) Ileum
- c) Oral pharynx
- d) Nephron

15. Cartilage regeneration is the function of the following cells;

- a) Osteocytes
- b) Mast cells
- c) Chondrocytes
- d) Myocytes

16. Surfactant is produced by;

- a) Goblet cells
- b) Alveolar type II cells
- c) Alveolar type I cells
- d) Macrophages

17. In spirometry:

- a) Inspiratory reserve volume is extra volume in with forced inspiration.
- b) Residual volume is extra volume pushed out with forced expiration.
- c) Expiratory reserve volume is always left in lungs, even with forced expiration.
- d) Tidal volume is volume in/out with quiet breath and it's about 1000ml.

18. The tidal volume is;

- a) The amount of air that normally moves into (or out of) the lung with each respiration.
- b) The amount of air that enters the lung but does not participate in gas exchange.
- c) The amount of air expired after maximal expiratory effort.
- d) The amount of gas that can be moved into and out of the lungs in 1 min.

19. Surfactant lining the alveoli

- a) Helps prevent alveolar collapse.
- b) Is produced in alveolar type I cells and secreted into the alveolus.
- c) Is increased in the lungs of heavy smokers.
- d) Is a glycolipid complex.

20. The second heart sound is caused by;

- a) Closure of the aortic and pulmonary valves.
- b) Vibrations in the ventricular wall during systole.
- c) Ventricular filling.
- d) Closure of the mitral and tricuspid valves.

### Section 2 (4 Short Answer Questions) (40 Marks)

(10 marks)

1. Discuss the following terms as used in physiology

- a) Homeostasis
- b) Apoptosis
- c) Metabolism
- d) Pinocytosis
- e) milieu interior

2. With the aid of a well labelled diagram, outline the phases of the ventricular action potential  
(10marks)
3. Briefly explain the difference between negative and positive feedback mechanisms giving two examples of each.  
(10marks)
4. Discuss the Cough Reflex  
(10marks)

**Section 3 (2 Long Answer Question) (40 Marks)**

1. Discuss the transport of carbon dioxide in blood and its role in acid base regulation (20marks)
2. Discuss in detail the generation of action potential and the synaptic transmission of impulses explaining how it brings about skeletal muscle contraction.  
(20marks)