



**TECHNICAL UNIVERSITY OF MOMBASA**

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**FACULTY OF APPLIED AND HEALTH SCIENCES**

**DEPARTMENT OF MEDICAL SCIENCES**

**UNIVERSITY EXAMINATION FOR:**

**DIPLOMA IN PHARMACEUTICAL TECHNOLOGY**

**AMD 2103: MEDICAL PHYSIOLOGY I**

**SPECIAL/ SUPPLIMENTARY EXAMINATIONS**

**SERIES: SEPTEMBER 2018**

**TIME: 2 HOURS**

**DATE: Sep 2018**

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of three Section(s). Attempt All questions in section A and B and any two questions in section C.

**Circle the correct answer in section A.**

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**SECTIONM A (40 MKS)**

1. . Which of the following is NOT a characteristic of life:
  - a. growth
  - b. responsiveness
  - c. reproduction
  - d. organ systems?
2. Which of these characteristics apply to smooth muscle?
  - A) striated, involuntary
  - B) striated, voluntary
  - C) unstriated, involuntary
  - D) unstriated, voluntary

3. Which of these statements about nervous tissue is not true?
  - A) Neurons are nourished and protected by other neurons
  - B) Neurons have cytoplasmic extensions called axons.
  - C) Electric signals (action potentials) are conducted along axons.
  - D) Neurons have granules in their cytoplasm
  
4. Chemical mediators of inflammation
  - A) cause blood vessels to constrict.
  - B) decrease the permeability of blood vessels.
  - C) initiate processes that lead to oedema.
  - D) help prevent clotting.
  
5. Which of these types of cells are most likely to change?
  - A) neurons
  - B) liver
  - C) skin
  - D) pancreas
  
6. The "basic unit of life" is-----.
  - a. the atom
  - b. the cell
  - c. water
  - d. the chemical level of organization
  
7. A homeostatic imbalance:
  - a. is considered the cause of most diseases
  - b. must be restored by negative feedback mechanisms
  - c. is when the internal conditions of the body become more stable
  - d. only occur when positive feedback mechanisms are overwhelmed
  
8. Extending the hand to accept something placed in it requires:
  - A. Pronation and rotation
  - B. Flexion and abduction
  - C. Flexion and supination
  - D. Adduction and pronation
  
9. The Na<sup>+</sup>-K<sup>+</sup> pump is-----.
  - A. a peripheral protein.
  - B. an integral protein.
  - C. a G protein.
  - D. a phospholipid.
  
10. Chondroblasts produce:
  - a) basement membranes
  - b) bone matrix
  - c) cartilage matrix

d) mesothelium

11. The proteins of muscle contraction are:
  - A. Actin and myosin
  - B. Actin and myoglobin
  - C. Myoglobin and collagen
  - D. Myosin and myoglobin
12. The cell membrane of a muscle fibre is known as the:
  - A. Myofibril
  - B. Sarcomere
  - C. Sarcolemma
  - D. Endomysium
13. The origin of a muscle is generally located:
  - A. At its insertion
  - B. Proximal to the insertion
  - C. Distal to the insertion
  - D. Lateral to the insertion
14. The sum of all chemical reactions in the body is termed:
  - a. homeostasis
  - b. physiology
  - c. dynamic feedback
  - d. metabolism
15. The stiffness of muscle tissue in rigor mortis partially results from:
  - a) excessive acetylcholine activity on muscle
  - b) excessive calcium release in muscle
  - c) excessive lactic acid build up
  - d) excessive contraction of the fibres
16. When an action potential reaches the presynaptic terminal of the motor neuron:
  - a) calcium is released inside of the muscle fibre
  - b) acetylcholine is released into the synaptic cleft
  - c) acetylcholinesterase is released into the synaptic cleft
  - d) physical contact between the motor neuron and the muscle fibre occurs
17. Curare, a toxin, blocks the acetylcholine receptors on muscle tissue. This would result in:
  - a) increased stimulation of the muscle fibre
  - b) inability of the muscle to respond to motor nerve stimulus
  - c) contraction of the muscle fibre
  - d) excessive contractions and convulsions
18. Which of the following is NOT a major function of muscle tissue?
  - a. Produce body heat

- b. body movements
- c. controlling volume of hollow organs
- d. storage of neurotransmitters

19. What is the smallest unit of contraction in muscle fibers:

- a. sarcomere
- b. sarcolemma
- c. sarcoplasm
- d. sarcofilament

20. How does Oxygen enter a cell?

- A. Diffusion
- B. Filtration
- C. Osmosis
- D. Active transport

21. In which of these locations are dense irregular elastic connective tissue found?

- A) ligaments
- B) large arteries
- C) adipose tissue
- D) dermis of the skin

22. The linings of the digestive, respiratory, excretory, and reproductive passages are composed of

- A. serous membranes.
- B. synovial membranes.
- C. mucous membranes.
- D. endothelium.

23. A single motor neuron may innervate as few as 3-5 fibers in muscles of the:

- a) upper arms
- b) legs
- c) eye
- d) heart

24. What is an action potential ?

- A. a migrating region where the electrochemical potential of a membrane undergoes reversal

- B. a flow of electrons from one cell to another
  - C. an electrically charged molecule such as sodium or potassium ions
  - D. a region where the electrochemical gradient of a membrane causes acetylcholine production
25. This hormone stimulates the breakdown of bone and the increase in blood calcium levels:
- a) growth hormone
  - b) estrogen
  - c) parathyroid hormone
  - d) calcitonin
26. Lack of acetylcholinesterase in the synaptic cleft would result in:
- a) decrease acetylcholine production by the motor neuron
  - b) relaxation of the muscle fibre
  - c) excessive, continuous stimulation of the muscle fibre
  - d) inability of the motor neuron to stimulate the muscle fibre
27. Given these characteristics:
- 1) cells located in lacunae
  - 2) proteoglycans in ground substance
  - 3) no collagen fibres present
  - 4) perichondrium on surface
  - 5) heals rapidly after injury
- Which of these characteristics apply to cartilage?
- A. 1,2,3
  - B. 1,2,4
  - C. 2,4,5
  - D. 1,2,4,5
28. Which of the following requires energy?
- A. Diffusion
  - B. Osmosis
  - C. Active transport
  - D. Facilitated diffusion
29. Which of the follow is an example of a positive feedback?
- A. Shivering to warm up in a cold winter storm
  - B. A cruise control set on your car applies more gas when going up a hill
  - C. You sweat on a hot summer's day and the blood vessels in your skin vasodilate
  - D. You get cut and platelets form a clot. This in turn activates the fibrin clotting system and more blood forms clots.

30. The following events are part of a negative-feedback mechanism.
1. Blood pressure increases.
  2. Control center compares actual blood pressure to the blood pressure set point.
  3. The heart beats faster.
  4. Receptors detect a decrease in blood pressure.
- Choose the arrangement that lists the events in the order they occur.
- A. 1,2,3,4
  - B. 1,3,2,4
  - C. 3,1,4,2
  - D. 4,2,3,1
31. A tissue with a large number of collagen fibres organized parallel to each other would most likely be found in-----.
- A. a muscle.
  - B. a tendon.
  - C. adipose tissue.
  - D. cartilage.
32. Which of the following best describes endocrine glands?
- A. have ducts.
  - B. Secrete hormones into capillaries within the body.
  - C. Are not discrete organs
  - D. Are all holocrine in nature
33. Pseudostratified ciliated columnar epithelium can be found lining the
- A. thyroid gland.
  - B. urinary bladder.
  - C. trachea.
  - D. kidney tubules.
34. Which of the following is not part of homeostasis?
- A. Sensor
  - B. Integrator
  - C. Effector
  - D. Maximiser
35. Which of these is not a function of bone?
- A. internal support and protection
  - B. attachment for the muscles
  - C. calcium and phosphate storage
  - D. synthesis and storage of vitamin C
36. This process aids in skeletal muscle relaxation after contraction:
- a) calcium is released from intracellular storage sites
  - b) motor neurons send electrical signal to muscle
  - c) acetylcholinesterase degrades acetylcholine
  - d) troponin binds calcium

37. The major regulatory proteins in muscle tissue are:
- myosin and tropomyosin
  - myosin and actin
  - actin and troponin
  - troponin and tropomyosin
38. In parts of the body, such as the urinary bladder, where considerable expansion occurs, one can expect to find which type of epithelium?
- cuboidal
  - transitional
  - pseudostratified
  - squamous
39. Which of the following organs is not retroperitoneal?
- adrenal glands
  - urinary bladder
  - kidneys
  - stomach
40. Given these organ and cavity combinations:
- heart and pericardial cavity
  - lungs and pleural cavity
  - stomach and peritoneal cavity
  - kidney and peritoneal cavity
- Which of the organs is correctly paired with a space that surrounds that organ?
- 1,2
  - 1,2,3
  - 1,2,4
  - 1,2,3

#### SECTION B (40MKS)

41. Describe the negative feedback mechanism (4mks)
42. Name the Nervous System Divisions and give examples(4mks)
43. What is Osmosis? (4mks)
44. Differentiate between Endocytosis and Exocytosis (4mks)
45. Describe the two types of muscle Contractions. (4mks)
46. Describe the role the Nucleus plays in the cell (4mks)
47. The sweat produced by eccrine glands is important in the maintenance of normal body temperature. (4mks)
48. List the major roles of the skin in the human body. (4mks)
49. What is the role of Lysosomes in the cell? (4mks)
50. Differentiate between Exocrine and Endocrine glands(4mks)

SECTION C (40 MKS)

51. Illustrate the meiosis cell division(20mks)
52. With proper illustration describe the phases of the Action Potential (20mks)
53. A. Describe the components of a reflex arc and give an example (10mks)  
b. Describe the processes at the neuromuscular junction(10mks)