AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCE
DEPARTMENT OF REHABILITATION MEDICINE
BACHELOR OF SCIENCE IN PHYSIOTHERAPY
END OF SEPT-DECEMBER 2024 TRIMESTER EXAMINATIONS

UNIT CODE: PHT 117 **UNIT NAME: Human Physiology. General organization (Special paper)**

DATE: **Friday/ 6th/ December**
TIME: **TWO HOURS**
START: **2PM** **STOP: 4PM**

INSTRUCTIONS (physical exams)

1. **Do not write on this question paper**

(Marks and questions distribution as per program curriculum.)

INSTRUCTIONS (Online examinations)

1. This exam is marked out of 70 marks
2. This Examination comprises 3 Sections
3. This online exam shall take 2 Hours
4. Late submission of the answers will not be accepted
5. Ensure your web-camera is on at all times during the examination period
6. No movement is allowed during the examination
7. Idling of your machine for 5 min or more will lead to lock out from the exam
8. The Learning Management System (LMS) has inbuilt integrity checks to detect cheating
9. Any aspect of cheating detected during and or after the exam administration will lead to nullification of your exam
10. In case you have any questions call the invigilator for this exam on Tel. 0705833434 and or the Head of Department on Tel 0720491032
11. For adverse incidences please write an email to: amiu.examinations@amref.ac.ke

Section A. Multiple choice questions. Answer all the questions (30 Marks)

1. Which statement about plasma membrane is the correct:
   a. Peripheral proteins provide structural channels that permits diffusion through the membrane.
   b. Integral proteins are also called extrinsic membrane proteins
   c. The plasma membrane has two phospholipid bilayers
   d. the hydrophobic ends of the plasma membrane meet in the water-poor interior of the membrane
2. which statement is incorrect about the plasma membrane.
   a. Transport through the cell membrane can be directly through the lipid bilayer
   b. Transport through the cell membrane only occurs through the transport proteins
   c. All of the above
   d. None of the above
3. Simple diffusion:
   a. Requires interaction of a carrier and channel proteins.
   b. Is a form of leakage channel that always remain open for substances and ions
   c. Can be categorized into co-transport and counter transport
   d. None of the above
4. Which of the following factors do not affect speed of diffusion
   a. Lipid solubility
   b. Weight of molecule
   c. Concentration gradient
   d. Ligand-receptor binding
5. Which mechanoreceptors are being stimulated in an athlete cooling down after practice doing passive and active stretches.
   a. Spindle fibers
   b. Golgi tendons
   c. Meissner's corpuscle
   d. Pacinian corpuscle
6. Which statement is incorrect about pinocytosis.
   a. The receptors generally are concentrated in small pits on the outer surface of the cell membrane, called coated pits.

b. The edges of the membrane around the points of attachment evaginate outward within a fraction of a second to surround the entire particle.
c. vesicle separates from the cell membrane leaving phagosome in the cell interior
d. b and d

7. which cations are dominant in the extracellular compartments.
   a. Calcium
   b. Potassium
   c. Magnesium
   d. Phosphate

1. A typical neuron has a resting membrane potential of:
   a. -70MV
   b. 70MV
   c. -55V
   d. None of the above

8. Which process does not utilize ATP
   a. Facilitated diffusion
   b. Vesicular transport
   c. Counter transport
   d. Co-transport

9. Which is not a characteristic of a mitochondria
   a. Mitochondria are self-replicative
   b. mitochondria contain DNA which controls replication
   c. The cristae provide a large surface area for chemical reactions to occur.
   d. Synthesize ribosomes

10. The most immature cell in the erythrocytic series is the:
    a. basophil erythroblasts
    b. reticulocyte
    c. polychromatophil erythroblasts
    d. erythropoietin

11. A megaloblastic cell is caused by what deficiency?
    a. Vitamin B_6.
    b. Vitamin B_{12}.
    c. Vitamin B_1.
    d. Iron

12. What do prokaryotes lack
    a. Nucleus
    b. Cell membrane
    c. Nuclear membrane
    d. A and C
13. Erythropoietin is produced in the
    a. Proerythroblasts
    b. Spleen
    c. Kidney
    d. Bone marrow
14. Which of the following is not a component of the reticuloendothelial system.
    a. Kidney
    b. Liver
    c. Skin
    d. Bone marrow
15. What is the role of liver in the reticuloendothelial system
    a. Store iron
    b. Produce erythropoietin
    c. Phagocytosis
    d. Exocytosis
16. What is the relationship between iron and the reticuloendothelial system
    a. Iron is transported to the bone marrow for erythropoiesis
    b. Iron is stored in the liver
    c. Iron is released into the blood stream
    d. All of the above
17. Which of the following would not be a hypothesis of the causes of jaundice awaiting confirmation by a physician
    a. excess production of bilirubin
    b. increased uptake of bilirubin into hepatic cells
    c. disturbed secretion of conjugated bilirubin into the bile canaliculi,
    d. intrahepatic or extrahepatic bile duct obstruction
18. Which occurs last in the clotting process.
    a. Conversion of fibrinogen to fibrin
    b. Conversion of prothrombin to thrombin

c. Secretion of thromboxane A2
d. Vasoconstriction

19. Which of the following is not a type of secondary active transport
    a. Uniporter
    b. Symporter
    c. Antiporter
    d. Co-transporter
20. Which of the following statements is not correct about the functional classification of peripheral nervous system
    a. Autonomic NS is an Involuntary motor control of smooth & cardiac muscles and glands
    b. afferent division are nerve fibers that carry sensory information from the CNS
    c. the sensory division is categorized into voluntary and involuntary
    d. sympathetic nervous system is responsible for fight of flight
21. the nervous tissue outside the brain and the spinal cord is:
    a. central nervous system
    b. somatic nervous system
    c. peripheral nervous system
    d. interneurons
    e. An involuntary response by the nervous system to a stimulus is a
    f. A) Synapse B) Reflex
    g. C) Motor response
    h. D) Smooth muscle
22. An involuntary response by the nervous system to a stimulus is:
    a. Synapse
    b. Reflex
    c. Proprioception
    d. Nociception
23. Repolarization and depolarization are as a result of:
    a. Ions moving across the cell membrane
    b. Ligands binding with receptors
    c. Inside of the cell becomes more positively charged
    d. All of the above
24. For a muscle contraction to occur:

a. Chemical synapses have a one-way conduction system
b. Acetyl choline is one of the common neurotransmitters in electrical synapses.
c. Neurotransmitters have to be permitted by ligand gated channels to go through the membrane and into the cell
d. All of the above.

25. During gaseous exchange, oxygen permeates the cell membrane via
a. Aquaporins
b. Protein carriers
c. Protein channels
d. Simple diffusion

26. The said oxygen in number 25:
a. Binds to iron in the heme
b. Forms oxyhemoglobin
c. Is low in highland regions
d. All of the above

27. The muscle:
a. Has fascicles covered by endomysium
b. The muscle is covered by a layer of perimysium
c. Muscle fibres are covered by epimysium
d. Smooth muscles lack cross striations

28. The portion of the myofibril (or of the whole muscle fiber) that lies between two successive Z disks is called?
a. Myofibril
b. Cross bridges
c. Z band
d. Sarcomere

29. Which of the following is false?
a. Actin is a thin filament
b. Myosin is a thick filament
c. Troponin promotes muscle contraction
d. sarcolemma Is the Intracellular Fluid Between Myofibrils.

30. The second heart sound is caused by
a. closure of aortic and pulmonary valves

b. ventricular filling

c. closure of mitral and tricuspid valves

d. opening of the mitral and tricuspid valves

Section B. Short answer questions. Answer all the questions (20 marks)

30. How does oxygen and carbon dioxide get across the cell membrane? (1 mark)
31. That only certain molecules may enter or exit the cell, whereas other molecules are not permitted to cross the cell membrane defines which property of the cell? (1 mark)
32. State and define four types of facilitated diffusion. (4 marks)
33. State three factors affecting the speed of simple diffusion. (3 marks)
34. State one sensory role for each of the following mechanoreceptors; Merkel disk, Meissner's corpuscle and Pacinian corpuscle. (3 marks)
35. Define diapedesis. (1 mark)
36. Where are Kupffer cells found? (1 mark)
37. State and define four types of anemias. (4 marks)
38. Illustrate the plasma membrane. (2 marks)

Section C. Long structured questions. Answer any of the 2 questions (20 marks)

39. A. Illustrate and outline the electrocardiograph. (6 marks)
    b. State and define two types of heart block. (4 marks)
40. A. Describe the processes involved in the reticuloendothelial system. (5 marks)
    b. Outline the stages of erythropoiesis (5 marks)
41. A. Outline the hemostasis events. (8 marks)
    b. What are the causes of thromboembolic conditions. (2 marks)