



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF REHABILITATION MEDICINE
BACHELOR OF SCIENCE IN PHYSIOTHERAPY**

END OF TRIMESTER EXAMINATIONS SEPTEMBER TO DECEMBER 2025

UNIT CODE: PHT 117

UNIT NAME: HUMAN PHYSIOLOGY (MAIN EXAM)

DATE: 10th DECEMBER 2025

TIME: 11.15am-1.15pm

INSTRUCTIONS

- 1. All students will have two (2) hours to complete the examination**
- 2. This is an online exam, Attempt all questions as per the instruction**
- 3. It is the student's responsibility to report any page and number missing in this paper.**
- 4. Check that the paper is complete**
- 5. Total number of pages is 6 including the cover.**
- 6. Read through the paper quickly before you start.**

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

1. The following statement is true about a cell; which one is it.
 - a. The cell membrane is made up of two bi-layers
 - b. The hydrophobic layer bathes the exterior of the cell
 - c. The hydrophilic layer bathes the interior of the cell
 - d. None of the above
2. Which of the following is the best description of erythrocyte under normal conditions.
 - a. Spindle shaped
 - b. Spherical
 - c. Sickle shaped
 - d. Biconcave disk
3. Which organelles contain hydrolytic enzymes for digestion of cellular waste
 - a. Peroxisome
 - b. Lysosome
 - c. Ribosome
 - d. Golgi apparatus
4. Which morphological change results in uncontrolled abnormal cell growth as seen in a cancer patient.
 - a. Dysplasia
 - b. Hyperplasia
 - c. Atrophy
 - d. None of the above
5. which is not a double membrane organelle among the following:
 - a. mitochondria
 - b. nucleus
 - c. cell membrane
 - d. all of the above
6. Which organelle can be considered semi-autonomous.
 - a. Lysosome
 - b. Mitochondrion
 - c. Ribosome
 - d. Golgi apparatus
7. Sodium potassium pump is an example of: (1 mark)
 - a. Primary active transport
 - b. Secondary active transport
 - c. Osmosis
 - d. Facilitated diffusion

8. The co-transport of glucose with sodium is an example of: (1 mark)
 - a. Simple diffusion
 - b. Facilitated diffusion
 - c. Primary active transport
 - d. Secondary active transport
9. Which of the following occur during pinocytosis. (1 mark)
 - a. Plasma membrane invaginates
 - b. Plasma membrane evaginates
 - c. Substances move down their concentration gradient
 - d. None of the above
10. The sodium potassium pump maintains resting membrane potential by:
 - a. Moving 2 sodium in and 3 potassium out
 - b. Allowing passive potassium leakage
 - c. Moving 3 sodium out and 2 potassium in
 - d. None of the above
11. The earliest site of red blood cell production during embryonic development is: (1 mark)
 - a. Liver
 - b. Bone marrow
 - c. Spleen
 - d. Yolk sac
12. The primary stimulus for increased red blood cell production is: (1 mark)
 - a. Increased plasma protein
 - b. Decreased oxygen tension in tissues
 - c. High carbon dioxide in blood
 - d. Low blood glucose
13. Which of the following cells first begins hemoglobin synthesis: (1 mark)
 - a. Proerythroblasts
 - b. Basophilic erythroblasts
 - c. Polychromatophilic erythroblasts
 - d. Reticulocyte
14. A patient with microcytic hypochromic anemia most likely has: (1 mark)
 - a. Vitamin B12 deficiency
 - b. Iron deficiency
 - c. Aplastic anemia
 - d. Hemolytic anemia
15. In aplastic anemia, the main abnormality is: (1 mark)
 - a. Defective hemoglobin synthesis
 - b. Increased destruction of RBCs

- c. Failure of bone marrow to produce blood cells
 - d. Excessive erythropoietin
16. Which of the following best describes pre-hepatic jaundice: (1 mark)
- a. Obstruction of bile flow
 - b. Excessive RBC destruction
 - c. Defective conjugation of bilirubin
 - d. Liver cell necrosis
17. The flight or fight response is mediated by which division of the somatic nervous system: (1 mark):
- a. Parasympathetic
 - b. Sympathetic
 - c. Enteric
 - d. none
18. the main cause of the resting membrane potential in neuron is: (1 mark)
- a. equal distribution of ions
 - b. sodium influx
 - c. potassium efflux
 - d. calcium influx
19. Which ion is essential for muscle contraction: (1 mark)
- a. Na⁺
 - b. Ca²⁺
 - c. K⁺
 - d. Mg²⁺
20. During muscle contraction, the A band: (1 mark)
- a. Shortens
 - b. Thickens
 - c. Disappears
 - d. Remains the same length
21. Which type of muscle fiber is most fatigue resistant: (1 mark)
- a. Type I (slow twitch)
 - b. Type IIa (fast oxidative)
 - c. Type IIb (fast glycolytic)
 - d. None
22. Which of the following contributes most to the negative resting membrane potential: (1 mark)
- a. Na⁺/K⁺ pump
 - b. High intracellular sodium
 - c. K⁺ leak channels

- d. Voltage gated Na⁺ channels
23. During the absolute refractory period, a neuron: (1 mark)
- Can be re-excited by a stronger than normal stimulus
 - Cannot be excited despite the strength of the stimulus
 - Is hyperpolarized
 - Is more excitable than at rest
24. Which of the following is the normal pacemaker of the heart: (1 mark)
- SA node
 - AV node
 - Bundle of HIS
 - Purkinje fibers
25. The SA node is located in which part of the heart: (1 mark)
- Interatrial septum
 - Wall of right atrium near superior venacava
 - Apex of the heart
 - Wall of left atrium
26. A first-degree heart block is best described as: (1 mark)
- No atrial impulses conducted to ventricles
 - Gradual delay until one impulse fails
 - Prolonged PR interval with all impulses conducted
 - Complete dissociation between atria and ventricles
27. A Mobitz type II second- degree heart block shows: (1 mark)
- Progressive PR lengthening
 - Fixed PR interval with dropped beats
 - No relation between P and QRS
 - Absent P waves
28. The QRS complex represents: (1 mark)
- Atrial depolarization
 - Ventricular depolarization
 - Atrial repolarization
 - SA node firing
29. The neurotransmitter at most neuromuscular junction is: (1mark)
- Noradrenaline
 - Acetylcholine
 - Dopamine
 - GABA
30. The conversion of prothrombin to thrombin is catalyzed by: (1 mark)
- Factor VIIa

- b. Prothrombinase complex
- c. Fibrinogen
- d. Factor XII

SECTION B. Short structured question. Answer all the question (20 Marks)

- 31. State 3 steps involved in coagulation. (3 marks)
- 32. State and define two types of synapses. (4 marks)
- 33. State and explain 2 Properties of cardiac muscle (4 marks)
- 34. List 4 Autorhythmic cells. (4 marks)
- 35. Give a clearly outlined illustration of an ECG. (5 marks)

SECTION C Long structured question. Attempt any two. (20 Marks)

- 36. Outline the molecular mechanism of muscle contraction. (10 mark)
- 37. Explain the cardiac cycle. (10 marks)
- 38. Outline Functional classification of the peripheral nervous system (10 marks)

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