

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF  
SCIENCE IN NURSING**

**NURU 113: MEDICAL PHYSIOLOGY I**

**STREAMS: BSC NURSING Y1S1**

**TIME: 2 HOURS**

**DAY/DATE: WEDNESDAY 08/04/2020**

**2.30 P.M. – 4.30 P.M.**

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**INSTRUCTIONS:**

- **Do not write anything on the question paper.**
- **Mobile phones and any other reference materials are NOT allowed in the examination room.**
- **The paper has three sections. Answer ALL questions.**
- **All your answers for section I (MCQs) should be on one page.**
- **Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.**
- **Write your answers legibly and use your time wisely.**

**PART I: MULTIPLE CHOICE QUESTIONS (20 MARKS)**

1. Ribosomes are found in cell cytoplasm. They are concerned with
  - (a) Protein synthesis
  - (b) Participate in phagocytosis
  - (c) Phospholipids synthesis
  - (d) Participate in exocytosis
  
2. Functions of Golgi complex in the cell include the following except
  - (a) Forms secretory vesicles that discharge processed proteins via exocytosis into the ECF.
  - (b) Forms membrane vehicles that ferry new molecules to the plasma membrane.
  - (c) Forms transport vesicles that carry molecules to other organelles, such as lysosomes.

- (d) Synthesizes fatty acids and steroids, e.g. estrogens
3. Storage and release of calcium ions that trigger contraction in muscle cells is a function of
- (a) Rough endoplasmic reticulum
  - (b) Smooth endoplasmic reticulum
  - (c) Peroxisomes
  - (d) Lysosomes
4. Apoptosis is
- (a) Programmed cell death
  - (b) Cell growth
  - (c) Cell division
  - (d) Cell differentiation
5. The following is true about the cell nucleus
- (a) The smallest organelle.
  - (b) The only organelle visible under the light microscope.
  - (c) Most cells have several nuclei
  - (d) Present in all prokaryotic cells that divide
6. The following factors increases the cardiac stroke volume except
- (a) Increased preload
  - (b) Increased contractility
  - (c) Increased afterload
  - (d) Positive inotropic agents
7. Agents with negative inotropic action include
- (a) Calcium channel blocking drugs
  - (b) Sympathetic stimulation
  - (c) Digitalis
  - (d) Epinephrine and norepinephrine

8. Positive chronotropic agents are
  - (a) Factors that raise the heart rate
  - (b) Substances that increase contractility
  - (c) Substances that decrease contractility
  - (d) Factors that decrease the heart rate
9. During atrial systole
  - (a) The Atrial Ventricular valves close
  - (b) Ventricular muscle initially shortens
  - (c) Contraction of the atria propels blood into the aorta and pulmonary artery
  - (d) Contraction of the atrial muscle narrows the orifices of the vena cava and pulmonary veins.
10. The following is true about Sinoatrial Node
  - (a) Contains parasympathetic nerve ending
  - (b) Is situated at the junction of the superior vena cava and right atria
  - (c) Contains sympathetic nerve endings
  - (d) Is situated at the junction of the pulmonary artery and left atria
11. Cardiac myocytes are autorhythmic. This entails that
  - (a) They depolarize spontaneously at regular time intervals
  - (b) The rate of depolarization is influenced by the ANS
  - (c) The rate of depolarization circulating catecholamines
  - (d) They are specialized
12. The following does not contain nucleus
  - (a) Leukocytes
  - (b) Erythrocytes

- (c) Reticulocytes
  - (d) Plasma cells
13. The process of phagocytosis involves all of the following except
- (a) Extension of pseudopods/projections
  - (b) Formation of phagosomes
  - (c) Ingestion by lysosomal enzymes
  - (d) Release of materials from a cell
14. Transcytosis involves
- (a) Endocytosis and exocytosis
  - (b) Osmosis and diffusion
  - (c) Simple diffusion and facilitated diffusion
  - (d) Transport proteins
15. The end-systolic ventricular volume in a healthy person is about
- (a) 100m/s
  - (b) 50m/s
  - (c) 10m/s
  - (d) 5m/s
16. The cardio inhibitory center in medulla
- (a) The nerves secrete acetylcholine, which binds to muscarinic receptors
  - (b) K efflux causes depolarization
  - (c) Sends signals by way of sympathetic nerves to the SA node, AV node, and myocardium.
  - (d) The nerves secrete norepinephrine, which binds to  $\beta$  – adrenergic receptors in the heart.

17. Baroreceptors
- (a) Are located in the aorta and internal carotid arteries
  - (b) Inform the cardiac center of changes in physical activity
  - (c) Are sensitive to blood pH, carbon dioxide and oxygen
  - (d) Found in the aortic arch, carotid arteries and medulla oblongata
18. The following is true about cations
- (a) Elevated blood levels of  $K^+$  or  $Na^+$  increase heart rate.
  - (b) Excess  $Na^+$  enhances  $Ca^{2+}$  inflow during cardiac Aps.
  - (c) Excess  $K^+$  enhances generation of Aps.
  - (d) A moderate increases in interstitial  $Ca^{2+}$  level speeds heart rate.
19. Cardiac activity is depressed by the following except
- (a) Hypoxia
  - (b) Acidosis
  - (c) Alkalosis
  - (d) Fever
20. Cardiac tamponade can be a complication of
- (a) Endocarditis
  - (b) Pericarditis
  - (c) Coronary artery disease
  - (d) Myocarditis

**PART II: SHORT ANSWER QUESTION (30 MARKS)**

1. State five (5) functions of skeletal system. (5 marks)
2. Describe the fluid mosaic model of the plasma membrane. (5 marks)

3. State five (5) functions of circulatory system. (5 marks)
4. Describe the cardiac valves. (8 marks)
5. (i) In relation to the Cardiac Action Potential, state the two (2) kinds of myocytes that constitute the cardiac conduction system. (2 marks)  
(ii) State five (5) components of the cardiac conduction system. (5 marks)

**PART III LONG ANSWER QUESTIONS (20 MARKS)**

Describe the phases of the Cardiac Action Potential. (20 marks)

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