

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

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

NURU 114: MEDICAL PHYSIOLOGY II

STREAMS: BSC NURSING Y1T1

TIME: 2 HOURS

DAY/DATE: TUESDAY 06/08/2019

11.30 A.M. – 1.30 P.M.

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 in section I and II and ONE question in section III.**
- **All your answer for section I (MCQs) should be on one page.**

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Regarding the movement of substances across the plasma membrane:
 - (a) Primary active transport does not require energy to drive the transport
 - (b) Diffusion is the movement of a substance against its concentration gradient
 - (c) Voltage gated ion channels actively transport ions across the membrane
 - (d) Ligand gated channels open in response to ligands binding to specific proteins on the membrane surface.

2. The contransport of glucose derives energy from
 - (a) Na^+ concentration gradient
 - (b) The glucose molecule being transport
 - (c) Ca^{2+} gradient
 - (d) The membrane voltage

3. If the stimulation of a cell is strong, the strength of the action potential produced would be:
 - (a) Weaker than that produced by weak stimulation
 - (b) Twice that produced by weak stimulation
 - (c) No different to that produced by weak stimulation
 - (d) Stronger than that produced by weak stimulation

4. Endocytosis is used by cells to:
 - (a) Secrete large molecules into the extracellular space
 - (b) Retrieve elements of the plasma membrane after exocytosis
 - (c) Is always employed by cells for secretion
 - (d) Is used to deliver material into the extracellular space

5. The following process is not potentially part of post translation modification during protein synthesis:
 - (a) Hydroxylation
 - (b) Deamination
 - (c) Carboxylation
 - (d) Folding of the protein

6. The following skin cell type has a sensory role:
 - (a) Merkel cells
 - (b) Dendritic cells
 - (c) Melanocytes
 - (d) Keratinocytes

7. The two hemispheres of the brain are connected by which nerve fibres or pathways?
 - (a) Lateral lemniscus
 - (b) Corticofugal fibers
 - (c) Corpus callosum
 - (d) Arcuate fasciculus

8. The following hormone is released by axons endings in the posterior pituitary:
 - (a) Follicle stimulating hormone
 - (b) Thyroid-stimulating hormone
 - (c) Human growth hormone
 - (d) Antidiuretic hormone

9. Contraction of the arrector pili muscle causes:
 - (a) "Goose bumps"
 - (b) Sweat to be released from sweat glands

- (c) Hair to be shed
 - (d) The skin to change color
10. When the body temperature rises above normal:
- (a) Blood flow to the skin increases
 - (b) Blood flow to the skin decreases
 - (c) Vasoconstriction occurs
 - (d) Sweat gland activity decreases
11. The rate of conduction of action potentials along a nerve will be increased by:
- (a) Stimulating the pump
 - (b) Decreasing the diameter of the nerve
 - (c) Myelinating the nerve
 - (d) Lengthening the nerve fiber
12. Some cells secrete chemicals into the extracellular fluid that act on cells in the same tissue.
- (a) Neural
 - (b) Endocrine
 - (c) Paracrine
 - (d) Autocrine
13. The action potential of a neuron:
- (a) Is initiated by efflux of
 - (b) Is terminated by efflux of
 - (c) Declines in amplitude as it moves along the axon
 - (d) Result in a transient reversal of the concentration gradient of across the cell membrane
14. The following is an integration center for the autonomic reflexes:
- (a) Hypothalamus
 - (b) Thalamus
 - (c) Pons
 - (d) Cerebrum
15. The pyramids of the medulla oblongata contain:
- (a) Descending corticospinal fibers
 - (b) Commissural fibers
 - (c) Ascending spinocerebellar fibers
 - (d) Ascending spinothalamic fibers
16. Epinephrine is secreted by:
- (a) Sympathetic preganglionic fibers
 - (b) Sympathetic postganglionic fibers

- (c) Parasympathetic preganglionic fibers
 - (d) Parasympathetic postganglionic fibers
17. Concerning cholinergic transmission:
- (a) All preganglionic neurons are cholinergic
 - (b) All parasympathetic postganglionic neurons are cholinergic
 - (c) Both a and b are correct
 - (d) None of the above is correct
18. Concerning the action potential of a nerve cell:
- (a) The intensity differs from one region of the membrane to another
 - (b) Occurs with equal amplitude throughout the membrane
 - (c) Does not involve movement of ions
 - (d) Depends on protein concentration in a cell
19. Osmosis is a special case of
- (a) Pinocytosis
 - (b) Carrier-mediated transport
 - (c) Facilitated diffusion
 - (d) Simple diffusion
20. The following is an inhibitory neurotransmitter in the nervous system:
- (a) Glycine
 - (b) Aspartate
 - (c) Glutamine
 - (d) Serotonin

SECTION B: SHORT ANSWER QUESTIONS (30 MARKS)

1. Explain any three (3) functions of the integumentary system. (6 marks)
2. Explain the physiologic changes due to parasympathetic stimulation in the following organ systems:
- (a) Cardiovascular (3 marks)
 - (b) Digestive (3 marks)
3. Communication is an essential function in the life of the cell:
- (a) Outline three fundamental properties of neurons that enable them to perform their physiologic functions. (3 marks)

- (b) Explain the difference between saltatory propagation and continuous propagation of action potentials in neurons. (4 marks)

4. Explain the physiological functions of the following structures in the human eye:

- (a) Lens (2 marks)
(b) Pigments (2 marks)
(c) Retina (2 marks)

5. State five (5) physiological functions of the hypothalamus (5 marks)

SECTION C: LONG ANSWER QUESTIONS (20 MARKS)

1. The nervous system is a communications and control network for the human body:

- (a) Explain any three (3) differences between graded potentials and action potentials (6 marks)
(b) Describe the specific physiological changes that yield signal transmission across the chemical synapse. (14 marks)

2. Reflexes provide useful information about the health of the nervous system:

- (a) Define reflex and state the four (4) types of reflexes in the human body. (5 marks)
(b) Explain how a stretch reflex occurs. (10 marks)
(c) Explain the functions of the spinal cord. (5 marks)
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