

CHUKA



UNIVERSITY

## UNIVERSITY EXAMINATIONS

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

NURS 112: MEDICAL PHYSIOLOGY I

STREAMS: BSC (NURS)

TIME: 2 HOURS

DAY/DATE: MONDAY 03/12/2018

8.30 AM – 10.30 AM

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#### INSTRUCTIONS:

1. Do not write anything on the question paper.
2. Mobile phones and any other reference materials are NOT allowed in the examination room.
3. The paper has three sections. Answer ALL questions in Sections A and B and C.

Section A consists of Twenty (20) compulsory multiple-choice questions.

Section B has Eight (8) compulsory short answer questions. Each question is worth FIVE marks. Answer all questions in the answer booklet provided. Responses written elsewhere may NOT be marked.

Section C has Two (2) long answer questions each worth TWENTY (20) marks. Answer BOTH QUESTIONS in the answer booklet provided.

4. All your answers for Section A (MCQs) should be on one page.
5. Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.
6. Write your answers legibly and use your time wisely

#### Section A: Multiple Choice Questions (20 Marks)

1. Which statement is correct about smooth muscles?
  - a. Is under involuntary control
  - b. Are multinucleated
  - c. Cells are separated by intercalated discs
  - d. Innervated by both sympathetic and parasympathetic systems

2. Functions of membrane proteins do not include?
  - a. Digestive
  - b. Transport
  - c. Signal transduction
  - d. Enzymatic
  
3. An animal cell in a hypertonic solution will be?
  - a. Turgid
  - b. Shrivelled
  - c. Plasmolysed
  - d. Lysed
  
4. Relay molecules in a signalling pathway are likely to take part during?
  - a. Reception
  - b. Transduction
  - c. Activation of a cellular response
  - d. Termination
  
5. Almost all the oxidative reactions in the cell occurs in the?
  - a. Golgi apparatus
  - b. Nucleus
  - c. Endoplasmic reticulum
  - d. Mitochondria
  
6. The percentage composition of plasma in total human body weight?
  - a. 55 %
  - b. 60%
  - c. 20%
  - d. 80%
  
7. The type of extracellular receptors that form a dimer when activated?
  - a. Chemically gated ion channel receptors
  - b. Tyrosine kinase receptors
  - c. G-protein-linked receptors
  - d. Integrins
  
8. Hemopoietic activity
  - a. Is indicated by a high reticulocyte count
  - b. Is decreased following hemorrhage
  - c. Is normal in anaplastic anemia
  - d. Is increased in renal disease
  
9. Neutrophils constitute what percentage of white blood cells?
  - a. 25-33%
  - b. 3-9%
  - c. 54-62%
  - d. 1%

10. When one sweats during exercise it is an example of
  - a. Positive feedback control
  - b. Feed forward control
  - c. Adaptive control
  - d. Negative feedback control
  
11. The hyperpolarization phase of the action potential is due to
  - a. Opening of voltage gated Na<sup>+</sup> channels
  - b. Prolonged opening of voltage gated K<sup>+</sup> channels
  - c. The closure of resting Na<sup>+</sup> channels
  - d. Due to the opening of Ca<sup>2+</sup> channels
  
12. The spike phase of the neuronal action potential is due to
  - a. The opening of voltage gated Na<sup>+</sup> channels
  - b. The opening of voltage gated K<sup>+</sup> channels
  - c. The closure of resting K<sup>+</sup> channels
  - d. The closure of voltage gated Na<sup>+</sup> channels
  
13. Which one of these is odd one out on passive transport across the plasma membrane?
  - a. Osmosis
  - b. Bulk flow
  - c. Simple diffusion
  - d. Facilitated diffusion
  
14. The following are functions of the epithelial tissue except?
  - a. Protection
  - b. Absorption
  - c. Filtration
  - d. Contraction
  
15. Which one is not loose connective tissue?
  - a. Areolar connective tissue
  - b. Adipose tissue
  - c. Reticular connective tissue
  - d. Ligament connective tissue
  
16. Which fluid compartment contains about 67% by volume of all body water?
  - a. Intracellular fluid
  - b. Plasma
  - c. Extracellular fluid
  - d. Interstitial fluid
  
17. Hematocrit?
  - a. The percentage of white blood cells in blood
  - b. The percentage of plasma proteins in blood
  - c. The percentage of red blood cells in blood
  - d. The percentage of platelets in blood

18. Plasma proteins that transport lipids and fat-soluble vitamins?
- Albumins
  - Antigens
  - Globulins
  - Fibrinogens
19. The capillary endothelium separates these two body fluid compartments.
- ICF and ECF
  - ICF and interstitial fluid
  - Cerebrospinal and brain tissue fluid
  - Plasma and interstitial fluid
20. What is meant by “Set-point” during homeostasis?
- The point at which a variable stabilizes
  - The intensity of a variable
  - The expected change of a variable
  - None of the above

**Section B: Short Answer Questions (40 Marks)**

- Describe five types of gastrointestinal tract movements (5 marks)
- Explain the phases involved in the process of deglutition (5 marks)
- Explain five mechanisms involved in cellular communication (5 marks)
- Distinguish between respiratory and metabolic acidosis (5 marks)
- Explain the stages of a signal transduction pathway (5 marks)
- a) Describe the cell membrane (2 marks)  
b) State three factors that support the “Fluid – Mosaic” theory (3 marks)
- Tabulate five differences between a chemical and an electrical synapse (5 marks)
- State five factors that determine the distribution of body water and fluids (5 marks)

**Section C: Long Answer Questions (40 Marks)**

- a) What is a respiratory surface (1 mark)  
b) State four adaptations of the above (4 marks)  
c) State Dalton’s and Boyle’s law as used in respiratory physiology (5 marks)  
d) Discuss the mechanisms involved in the regulation of the respiratory system (10 marks)

2. a) State five functions of salivary juice (5 marks)
- b) Describe the defecation reflex (5 marks)
- c) Outline the functions of gastrointestinal hormone secretin (5 marks)
- d) Discuss the absorption pathway for lipids and lipid – soluble end-products of digestion (10 marks)
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