

UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCE

SUPPLEMENTARY EXAMINATION, JULY 2013

COUESE TITLE: PRINCIPLES OF ANATOMY AND PHYSIOLOGY

COURSE CODE: EHM 108

TIME ALLOCATED: TWO (2) HOURS

MARKS ALLOCATED: 75

INSTRUCTION:

- **THERE ARE SEVEN (7) PRINTED PAGES EXCLUDING COVER PAGE**
- **THERE ARE 2 SETIONS:**
 - **SECTION A WITH MULTIPLE CHOICE QUESTIONS**
 - **SECTION B WITH 2 SHORT ESSAYS QUESTIONS**

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO BY THE INVIGILATOR

SECTION A: OBJECTIVE QUESTIONS (35 MARKS)

QUESTION 1 A: MULTIPLE CHOICE

For each question, choose the most appropriate response and write in your answer sheet the corresponding letter only, in **capital letters**. Each correct response carries 1 mark.

1. Which of the following structures is located anteriorly to the heart?
 - A. Vertebral column
 - B. Lungs
 - C. Diaphragm
 - D. Sternum

2. The main role of K^+ is _____.
 - A. strengthening of bones
 - B. formation of haemoglobin and transport of oxygen
 - C. neuromuscular transmission
 - D. enzyme cofactor

3. Which of the following type of muscle tissue is striated?
 - A. Skeletal muscle
 - B. Cardiac muscle
 - C. Smooth muscle
 - D. a and b

4. Which component of the skin protects the body from ultraviolet rays?
 - A. Keratin
 - B. Melanin
 - C. Collagen
 - D. Tissue fluid

5. Which of the following membrane proteins participate in the generation of a resting membrane potential?
 - A. Leak channels

- B. Na⁺ - K⁺ pump
 - C. Phospholipids
 - D. a and b
6. The resting membrane potential of a neuron is about _____.
- A. - 100 mV
 - B. - 70 mV
 - * C. +70 mV
 - D. +100 mV
7. Which of the following is correct about the anatomy of a motor unit?
- A. Each nerve fibre only supplies one muscle fibre.
 - B. One neuron can supply many muscle fibres
 - C. Each muscle fibre can receives input from many neurons at the same time
 - D. All of the above
8. Which of the following is correct about a reflex action?
- A. A reflex action is a protective mechanism of the body.
 - B. Blinking is an example of a reflex action.
 - C. A reflex action may not involve the brain
 - D. All of the above
- * 9. Which of the following is a component of the peripheral nervous system?
- A. Cranial nerves
 - B. Spinal nerves
 - C. Brain stem
 - D. a and b
10. By which of the following processes do muscles obtain energy from food?
- A. Anabolism
 - B. Anaerobic respiration
 - C. Aerobic respiration
 - D. b and c

11. What is the main role of the cerebellum in the body?
- A. To control motor movements
 - B. To regulate body temperature
 - C. Cognitive functions
 - D. Controls hearing
12. Which of the following is NOT an endocrine gland?
- A. Sebaceous glands
 - B. Hypothalamus
 - C. Pituitary gland
 - D. None of the above
13. Which of the following is the primary role of sweat glands?
- A. Regulation of volume of water in the body
 - B. Regulation of body temperature
 - C. Lubricate the skin
 - D. All of the above
14. A red blood cell _____.
- A. has a very long half life
 - B. does not have a nucleus
 - C. serves as part of the immune system, protecting the body from infection
 - D. all of the above
15. Which of the following influences the flow of blood in the cardiovascular system?
- A. Skeletal muscle contraction
 - B. Cardiac muscle contraction
 - C. Force of gravity
 - D. All of the above
16. When we immunize babies, we are _____.
- A. building specific immunity to specific illness
 - B. strengthening the innate/nonspecific immunity
 - C. we are killing bacteria which we are born with

D. all of the above

17. The functional unit of a kidney is called a _____.

- A. Cell
- B. Nephron
- C. Motor unit
- D. Sarcomere

18. Sperms are manufactured by the _____.

- A. penis
- B. testis
- C. bladder
- D. Stomach

19. The internal environment of the body _____.

- A. Includes the lumen of the gastrointestinal tract
- B. Refers specifically to the internal body temperature only
- C. Is always constant under normal circumstances
- D. All of the above

20. Structural and functional differences among individuals are a result of

_____.

- A. Differences in genes
- B. Environmental factors
- C. No known cause
- D. a. and b.

[20]

QUESTION 1B: MATCHING AND TRUE OR FALSE

Choose a word or phrase in column B that best fits the descriptions in each statement given in column A, and write the corresponding letter only in your answer sheet, in **capital letters**, e.g. 26 B. Each correct response carries 1 mark.

Column A	Column B
1. Location of the abdomen with respect to the vertebral column	(a) Optic nerve
2. A bone that is part of the axial skeleton	(b) Olfactory nerve
3. Charge difference (voltage) across a cell membrane	(c) Posterior
4. A membranous tissue that surrounds the heart muscle	(d) Sternum
5. A dark staining junction between two cardiac cells	(e) Acetylcholine
6. The main control centre in the brain	(f) Anterior
7. Cranial nerve responsible for sense of smell	(g) Humerous
8. A chemical substance that acts as both a neurotransmitter and a hormone	(h) Membrane potential
	(i) Pericardium
	(j) Adrenaline
	(k) Epineurium
	(l) Intercalated disc
	(m) Thalamus
	(n) Parasagittal
	(o) Hypothalamus
	(p) Midsagittal

State whether each of the following statements is true (T) or false (F), and write the corresponding letter only, in **capital letters**, e.g. 12 B. Each correct response carries 1 mark.

9. Blood is a connective tissue
10. The cell is surrounded by a double membrane.

11. The amount of force generated by a muscle depends on the number of muscle fibres activated.
12. Digestive enzymes work under specific pH and temperature
13. The kidney detoxifies substances that are harmful to the body
14. Genes exist in pairs
15. The gastrointestinal tract has the same layers of tissue from mouth to anus.

[15]

[Total 35 Marks]

SECTION B: SHORT ESSAY QUESTIONS (40 MARKS)

QUESTION 2

- 2.1 State the four (4) chambers of the heart and state the function of each [4]
- 2.2 State any five (6) glands or organs with glandular tissue which secretes hormones [6]
- 2.3 Munya is now old and he can't read without glasses, but all other things he can do with no problems. Describe and explain, with the aide of illustrations, the basis of his visual problem, and how the glasses correct the problem. [10]

[Sub-total 20 Marks]

QUESTION 3

- 3.1 Give a brief explanation to each of the following statements based on your knowledge of the principles of Anatomy and Physiology:
- (i) A severely stressed or frightened person may appear pale [2]
 - (ii) The skin of the hands of people who do rough and heavy duty work is thicker than that of office workers [2]
 - (iii) If one dies, the body becomes rigid [2]
 - (iv) On a cold day, people produce more urine than on a hot day [2]
 - (v) If one is flown too high into the sky, he or she may end up struggling to breathe [2]
- 3.2 Sipho has ingested a liquid chemical substance whose effect to the body is not known. Discuss the possible health outcomes to Sipho in terms of anatomy and physiology. [10]
- [Sub-total 20 Marks]**