KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2008/2009

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL LABORATORY SCIENCES

SML 104: HUMAN PHYSIOLOGY

DATE: Friday, 11th September, 2009 TIME: 8.00 a.m. – 10.00 a.m.

SECTION A:

Answer **ALL** questions.

1. With the aid of a diagram describe the various body fluids and body fluid compartments. (5 marks)

2. Briefly describe the process of food absorption in the human digestive system (5 marks)

3. Give a brief overview of the human lymphatic system (5 marks)

SECTION B:

Answer **ONE** question only.

4. Discuss in detail, the male and female secondary sex organs (20 marks)

5. a) Describe the composition of human blood (10 marks)
   b) Discuss the endocrine activities of pituitary body and the adrenal glands (10 marks)

SECTION C:

Consists of 30 multiple choice question. Tick the correct answer. Each correct response earns ½ a mark.

1. Which of the following is the best definition of physiology
   a) The study of human growth and reproduction.
   b) The study of how the body functions at the various levels of organization.
   c) The study of the structure of the human body.
   d) The study of organ systems and organs of the body.

2. Which of the following statements is false?
   a) Communication of a cell to the outside world occurs across the cell membrane.
   b) Homeostasis is an important process in the body.
   c) Only a few living cells of the body are in direct contact with the external environment.
   d) Most cell-to-cell communication uses chemicals.
   e) Teleological study of human physiology is an important approach to studying physiology.

3. The stomach, intestines, liver, and pancreas are all examples of
   a) organ systems.
   b) Tissues.
   c) Organs.
   d) Molecules.
   e) Cells.

4. The stomach, intestines, liver, and pancreas are all part of the _____system.
   a) nervous
   b) reproductive
   c) circulatory
   d) digestive
   e) endocrine

5. Extracellular fluid
   a) surrounds cells.
   b) Surrounds cells, can include the blood plasma, and forms a buffer zone to help protect cells from drastic environmental changes.
   c) Is found inside cells.
   d) Forms a buffer zone to help protect cells from drastic environmental changes.
   e) can include the blood plasma.
   f) Is found inside cells, can include the blood plasma, and forms a buffer zone to help protect cells from drastic environmental changes.

6. The law of mass balance states that
   a) an adult's body will achieve a particular mass (weight) and stay there.
   b) The amount of mass in the universe is constant.
   c) All balances must accurately weigh out equal masses.
   d) If the amount of a substance in a body stays constant, any gain must be offset by an equal loss.
   e) Mass is neither created nor destroyed.

7. Which two systems of the body act closely together to communicate with the other systems of the body?
   a) Endocrine and musculoskeletal
   b) Nervous and endocrine
   c) Endocrine and respiratory
   d) Digestive and nervous
   e) Digestive and circulatory

8. The plasma membrane
   a) is a complex combination of a carbohydrates and proteins.
   b) Is composed of only carbohydrate molecules.
   c) Is composed of a bilayer of proteins.

d) is a complex combination of carbohydrates and lipids.

a. Is composed of a bilayer of lipids.

9. Which of these is a membranous organelle?

a) Mitochondria

b) Glycogen granule

c) Mitochondria and Golgi apparatus

d) Golgi apparatus

e) None of the listed items is an organelle.

10. Most of the ATP required to power cellular operations is produced in the

a) Mitochondria.

b) endoplasmic reticulum.

c) Golgi apparatus.

d) Nucleus.

e) ribosomes.

11. This organelle is considered to be the “power house” of the cell.

a) None of these.

b) Endoplasmic recticulum

c) Mitochondria

d) Golgi Aparatus

12. Which of the following part(s) of the cell is responsible for protein and lipid synthesis?

a) The endoplasmic recticulum

b) Lysosomes

c) The centioles

d) Peroxisomes

e) Flagella

13. Which of the following is not a digestive function?

a) motility

b) filtration

c) chemical and mechanical breakdown of foods

d) absorption

e) secretion

f) ingestion

14. Structures that function to increase surface area along the GI tract include:

a) villi in the intestine.

b) rugae in the stomach.

c) crypts in the intestine.

d) plicae in the intestine.

e) rugae in the stomac, plicae in the intestine, villi in the intestine, and crypts in the intestine.

15. The swallowing center in the brain that coordinates the muscular reflexes is located in the

a) cerebrum.

b) medulla.

c) cerebellum.

d) pons.

e) hypothalamus.

16. Arrange these airways in the order a breath of inhaled air would encounter them:

- 1. Larynx
- 2. Trachea
- 3. Pharynx
- 4. Bronchioles
- 5. Bronchi

a) 3,2,1,5,4

b) 1,2,3,5,4

c) 1,2,3,4,5

d) 3,1,2,5,4

e) 2,3,1,4,5

17. The upper respiratory tract includes all except the:

a) pharynx.

b) lungs.

c) trachea.

d) larynx.

e) nasal cavity.

18. Most of the oxygen transported by the blood is

a) bound to hemoglobin.

b) carried the same way as most of the carbon dioxide.

c) dissolved in plasma.

d) in ionic form as solute in the plasma.

e) carried by while blood cells.

19. Which statement is incorrect?

a) Each muscle fiber is densely packed with myofibrils composed of contractile and elasted proteins.

b) The cell membrane of a muscle fiber is the sarcolemma.

c) Muscle cells are surrounded by a branching network of transverse tubules.

d) All of these statements are correct.

e) Muscle cells are called muscle fibers.

20. The neurotransmitter that signals the contraction of skeletal muscle fibers is

a) acetylcholine.

b) dopamine and epinephrine.

c) epinephrine.

d) dopamine, epinephrine, and acetylcholine.

e) dopamine

21. Muscle fibers can obtain energy from _____when the oxygen supply for catabolism is too slow to meet the ATP demands of heavy exercise.

a) fatty acids

b) proteins, glucose, and fatty acids

c) proteins and glucose

d) glucose

e) proteins

22. Skeletal muscles with the most endurance will be _____in color.

a) blue

b) white

c) red

d) grey

e) brown

23. At the end of the stomach, there is _____ that keeps the contents from leaving the stomach.

a) Gastrophangeal valve

b) Bicuspid valve

c) Pyloric valve

d) Endometrium

e) Tricuspid valve

24. The urinary system

a) maintains plasma ion balance.

b) Eliminates organic waste products and foreign substances.

c) Contributes to homeostatic regulation.

d) Regulates the volume of the extracellular fluid.

e) does all of the above.

25. Functions of the kidneys include all but one of the following. Identify the exception

a) Regulation of blood osmolarity

b) Homeostatic regulation of blood pH

c) Regulation of extracellular fluid volume

a) Regulation of blood protein levels

d) Maintenance of ion balance in body fluids

26. The basic functional unit of the kidney is the

a) glomerulus.

b) nephron.

c) renal corpuscle.

d) loop of Henle.

e) filtration unit.

27. The process of filtration occurs at the

a) loop of Henle.

b) collecting duct.

c) Bowman’s capsule.

d) proximal tubule.

e) distal tubule.

28. The process of urine formation involves

a) reabsorption of water.

b) reabsorption of certain solutes.

c) filtration of plasma.

d) secretion of wastes.

e) all of the above.

29. Substances secreted by the distal tubule include

a) hydrogen ions.

b) all of the above.

c) potassium ions.

d) penicillin.

e) creatinine.

30. The outermost layer of kidney tissue is/are the

a) renal cortex/

b) renal medulla.

c) collecting duct.

d) vascular elements.

e) renal pelvis.