

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

FINAL EXAMINATION

MAY 2018

COURSE CODE: EHS 108
TITLE OF PAPER: PRINCIPLES OF ANATOMY AND PHYSIOLOGY
DURATION: 2 HOURS
MARKS: 100

INSTRUCTIONS

- 1. THIS PAPER CONSISTS OF TWO (2) SECTIONS: SECTION 1 – MULTIPLE CHOICE AND SECTION 2 – ESSAY QUESTIONS.**
- 2. ANSWER ALL QUESTIONS IN SECTION ONE AND TWO QUESTIONS IN SECTION TWO.**
- 3. READ QUESTIONS AND INSTRUCTIONS CAREFULLY.**
- 4. EACH QUESTION IS TO BE ANSWERED ON A SEPERATE SHEET OF PAPER.**

THIS PAPER IS NOT TO BE OPENED UNTIL THE INVIGILATOR HAS GRANTED PERMISSION.

SECTION 1

Instructions: For each of the following questions/statements, choose the most appropriate response and write the question number and corresponding letter in your answer sheet, in capital letters, e.g. 26. B. Each correct response carries one mark.

1. A term that means “away from the midline” is -----
 - A. Distal
 - B. Lateral
 - C. Medial
 - D. Proximal

2. You place blood cells in an unknown solution and observe them with a microscope; you notice that most of the cells have shrunk (crenated). Therefore, you conclude that the unknown solution is
 - A. Isotonic to the cells
 - B. Isosmotic to the cells
 - C. Hypertonic to the cells
 - D. Hypotonic to the cells

3. The production and export of milk from mammary gland cells involve which of the following cell organelles?
 - A. Lysosomes
 - B. Vesicles
 - C. Golgi apparatus
 - D. Rough endoplasmic reticulum

4. As a result of exercise, there is an increase in the number of ----- in muscle cells.
 - A. Nucleus
 - B. Centrioles
 - C. Mitochondria
 - D. Golgi apparatus

5. Transcription takes place in the ----- of a cell
- A. Cytosol
 - B. Nucleus
 - C. Ribosomes
 - D. Mitochondria
6. Lysosomes perform which of the following cellular functions?
- A. Generate energy
 - B. Protein synthesis
 - C. Lipid synthesis
 - D. Intracellular digestion
7. Which of the following molecular components of the lipid bilayer of the plasma membrane possesses a charged polar “head” and an uncharged nonpolar “tail”?
- A. Integral protein
 - B. Glycolipid
 - C. Phospholipid
 - D. Cholesterol
8. Cells may be said to be “sugar-coated” due to the presence of -----
- A. Glycolipids
 - B. Glycocalyx
 - C. Cholesterol
 - D. Phospholipids
9. Which epidermal layer is only found in the thick skin?
- A. Stratum lucidum
 - B. Stratum granulosum
 - C. Stratum corneum
 - D. Stratum germinativum
10. The secretion that lubricates and inhibits growth of bacteria on the skin is called-----
- A. Sweat
 - B. Serum
 - C. Lymph
 - D. Sebum

11. Rearrange the following layers of the epidermis, beginning with the deepest layer to the superficial stratum:
- A. Spinosum, germinativum, corneum, granulosum
 - B. Granulosum, spinosum, germinativum, corneum
 - C. Germinativum, corneum, granulosum, spinosum
 - D. Germinativum, spinosum, granulosum, corneum
12. Differences in skin color among individuals are the result of -----
- A. Differences in the number of melanocytes
 - B. Differences in the amount of melanin made
 - C. Differences in the number of keratinocytes
 - D. Differences in the amount of keratin made
13. Skin exposure to small amounts of ultraviolet radiation serves to -----
- A. Stimulates melanocytes to produce melanin
 - B. Produces a tan that is beneficial to the skin
 - C. Induces growth of cancerous tissue in the sun
 - D. Converts steroid related to cholesterol into vitamin D
14. When the body temperature becomes abnormally high, thermoregulatory homeostasis is maintained by-----
- A. An increase in sweat gland activity and an increase in blood flow to the skin
 - B. An increase in blood flow to the skin and a decrease in sweat gland activity
 - C. An increase in sweat gland activity and a decrease in blood flow to the skin
 - D. A decrease in blood flow to the skin and a decrease in sweat gland activity
15. Special smooth muscles in the dermis that, when contracted, produce "goose bumps" are-----
- A. Root sheaths
 - B. Tissue papillae
 - C. Arrector pili
 - D. Cuticular papillae

16. Striae occur as a result of -----
- A. Overstretching of the dermis
 - B. Overstretching of the epidermis
 - C. Too many fibers in the hypodermis
 - D. Loss of hair loss
17. A “nonself” substance that can provoke an immune response is called a (n)-----
- A. Antibody
 - B. Antigen
 - C. Interferon
 - D. Immunoglobulin
18. Active artificially acquired immunity is a result of -----
- A. Vaccination
 - B. Contact with pathogen
 - C. Injection of an immune serum
 - D. Antibodies passed on from mother to fetus though the placenta
19. Cytotoxic T cells kill target cells -----
- A. By releasing oxidizing agents
 - B. By secreting antibodies
 - C. Through injection of tumor necrosis factor
 - D. Through insertion of perforins into target’s membrane
20. The receptors for taste and smell are classified as -----
- A. Mechanoreceptors
 - B. Chemoreceptors
 - C. Proprioceptors
 - D. Thermoreceptors
21. Anosmia, an olfactory disorder is commonly caused by -----
- A. Iron deficiency
 - B. Genetic disorders
 - C. Head injuries
 - D. Loss of gustatory epithelial cells

22. When a person cries, he or she tends to keep on wiping his/her dripping nose. The nose drips because _____
- A. Lacrimal gland secretions wash the eyeball and drain into the lacrimal duct, which empties into the nasal cavity
 - B. Olfactory mucosa is sensitized to increase secretions into the nose
 - C. Special secretory glands in the nose start to produce secretions into the nose
 - D. The eyeball produces tears that drain into the lacrimal canal and then into the nose
23. The conjunctiva mucous membrane covers -----
- A. The inner surface of the sclera
 - B. The inner surface of the eyelids only
 - C. The whole outer surface of the sclera
 - D. Both the inner surface of the eyelids and the visible portion of the sclera
24. Arrange the tunics of the walls of the eyeball in their correct sequence from inside out.
- A. Choroid, sclera, retina
 - B. Retina, choroid, sclera
 - C. Sclera, choroid, retina
 - D. Retina, sclera, choroid
25. Which sequence follows the correct passage of light entering the cornea?
- A. Cornea, lens, posterior segment, anterior segment, pupil
 - B. Cornea, anterior segment, posterior segment, lens
 - C. Cornea, anterior segment, pupil, lens, posterior segment
 - D. Cornea, pupil, posterior segment lens, anterior segment
26. When focusing on a distant object, the lens -----
- A. Flattens
 - B. Bulges
 - C. Becomes more convex
 - D. Becomes more concave

27. When viewing a close object, the lens -----
- A. Flattens
 - B. Bulges
 - C. Becomes more convex
 - D. Becomes more concave
28. An inflammation of the stomach wall is called-----
- A. Stomatitis
 - B. Peptic ulcer
 - C. Gastritis
 - D. Peritonitis
29. Which of the following are risk factors for a peptic ulcer?
- i. Over exercise
 - ii. Eating spoiled foods
 - iii. Alcohol consumption
 - iv. Stress
- A. i. and ii
 - B. ii. and iii
 - C. iii. and iv
 - D. i. only
30. The only stomach function that is essential to life is -----
- A. The presence of HCL
 - B. The secretion of intrinsic factor
 - C. The secretion of pepsinogen
 - D. Mechanical digestion
31. Which of the following conditions is directly associated with an increased risk for heart disease and stroke?
- A. Periodontitis
 - B. Dental caries
 - C. Gingivitis

- D. Stomatitis
32. Which of the following teeth are most commonly impacted?
- A. Premolars
 - B. Baby teeth
 - C. Wisdom teeth
 - D. Deciduous teeth
33. Halitosis is caused by-----
- A. Loss of teeth
 - B. Lack of amylase in saliva
 - C. Increase salivation in the mouth
 - D. Increased metabolic activity of anaerobic bacteria at the back of the tongue
34. The propulsive function that occurs in the esophagus is called-----
- A. Ingestion
 - B. Swallowing
 - C. Peristalsis
 - D. Segmentation
35. The inner lining of the heart is formed by-----
- A. Epicardium
 - B. Endocardium
 - C. Myocardium
 - D. Perimetrium
36. When the mitral valve closes, it prevents the backflow of blood from the -----
- A. Right ventricle into the pulmonary trunk
 - B. Right atrium into the right ventricle
 - C. Left atrium into the left ventricle
 - D. Left ventricle into the left atrium

37. Which of the following statements is **NOT** true about the shape, position, and location of the heart?
- A. The heart is located between the two lungs within the mediastinum
 - B. Approximately two-thirds of the heart is found to the left of the midline
 - C. The heart is enclosed in a double-layered sac called the pleural membrane
 - D. The heart is shaped like a cone with the base facing the right shoulder, and the apex facing the left shoulder
38. Which of the following valves is most often faulty in the heart?
- A. Aortic
 - B. Mitral
 - C. Tricuspid
 - D. Pulmonic
39. Coronary arteries arise from the -----
- A. Aorta
 - B. Pulmonary artery
 - C. Superior vena cava
 - D. Inferior vena cava
40. Which sequence best describes the flow of lymph through the lymphatic system?
- A. Capillaries, vessels, trunks, ducts
 - B. Ducts, vessels, trunks, capillaries
 - C. Ducts, trunks, capillaries, vessels
 - D. Capillaries, trunks, vessels, ducts
41. Which of the following are located in the spleen's white pulp?
- A. Blood vessels
 - B. Capsules
 - C. Lymphocytes
 - D. Macrophages

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42. The collection of lymphoid tissue that guides mucosal surfaces includes all the following, **EXCEPT**-----
- A. Tonsils
 - B. Spleen
 - C. Appendix
 - D. Peyer's patches
43. In addition to its lymphoid function, this organ holds a reservoir of platelets
- A. Tonsils
 - B. Spleen
 - C. Appendix
 - D. Peyer's patches
44. The lymphoid tissue's structural framework is composed of -----
- A. Adipose tissue
 - B. Squamous epithelial tissue
 - C. Reticular connective tissue
 - D. Dense, irregular connective tissue
45. A major function of the lymphatic system is -----
- A. Gas distribution
 - B. Blood circulation
 - C. Nutrients distribution
 - D. Return tissue fluid to the cardiovascular system

INSTRUCTIONS: Match each of the following lymphoid tissues with the correct corresponding characteristic. Write the letter accompanying the correct response e.g. 40. B. NB: There is **only one (1) answer** for each question.

Lymphoid tissues	Characteristic
46. Palatine tonsils	A. Surround openings of the auditory tubes into pharynx
47. Tubal tonsils	B. Prevent bacteria from breaching intestinal wall
48. Pharyngeal tonsils	C. Located at either sides at posterior end of oral cavity
49. Lingual tonsils	D. Are referred to as adenoids if enlarged
50. Appendix	E. Lumpy lymphoid follicles at the base of the tongue

Total: 50 Marks

SECTION 2

Instructions: In this section, answer only two (2) questions. Questions 1 is compulsory, and then choose any other question.

Question 1

Situation: Your friend has been using drugs (cocaine) for two years now. He tells you that this “stuff” is no longer working in his body. He quickly makes a cheap mixture of toxic rattex and cocaine just to quench his cravings. **Question A-B relate to the situation.**

- A. Describe how cocaine produces its effects in the neurons (5)
- B. State any four (4) long term effects of using cocaine (4)
- C. Describe the two (2) functions of a myelin sheath (2)
- D. Describe the three (3) basic functions of the nervous system (6)
- E. Draw a structure of a motor neuron and label the following: (8)
- Dendrites
 - Axon
 - Nucleus
 - Schwann cell
 - Myelin sheath
 - Terminal branches
 - Node of Ranvier
 - Axon terminal

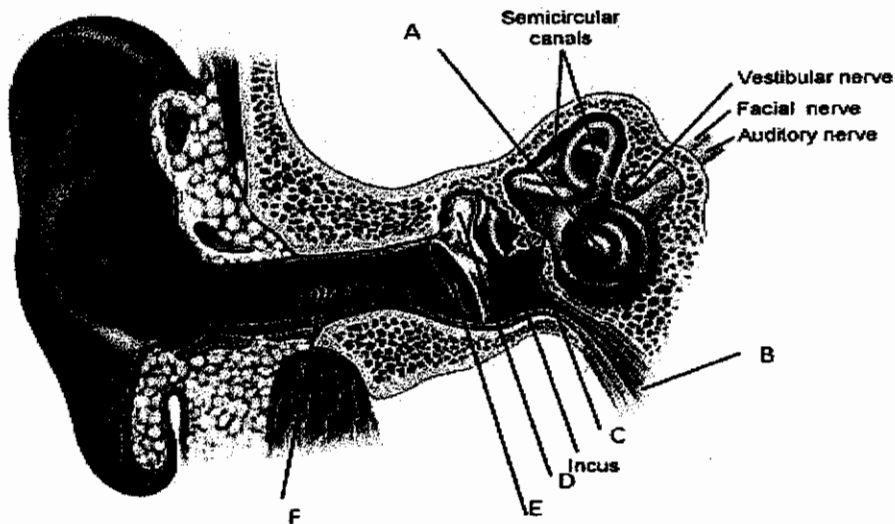
Total: 25 Marks

Question 2

- A. What are tears and what structure secretes them? (2)
- B. Describe how rods and cones differ functionally (2)
- C. Explain where the fovea centralis is located in the eye and why it is important (3)
- D. Describe the two (2) classifications of deafness and give examples (6)

E. Label the following ear structures (A-F)

(6)



F. Describe the function of each of the above ear structures in E (A-F)

(6)

Total: 25 Marks

Question 3

A. State the four (4) coronary arteries

(4)

B. Differentiate between a pulmonic circuit and a systemic circuit

(4)

C. Describe how angina pectoris differs from a myocardial infarction/heart attack

(3)

D. Draw a structure of the heart's intrinsic conducting system and label the following:

(7)

- Left atrium
- Left ventricle
- Purkinje fibers
- Sinoatrial (SA) node
- Atrioventricular (AV) node
- Atrioventricular bundle (Bundle of His)
- The right and left bundle branches

E. State the function each of the above structures of the heart intrinsic conducting system in D.

(7)

Total: 25 Marks