

UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCES

RE-SIT EXAMINATION

JULY 2017

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 THREE QUESTIONS IN SECTION TWO.
3. READ QUESTIONS AND INSTRUCTIONS CAREFULLY.
4. EACH QUESTION IN SECTION TWO 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 question/statement, choose the most appropriate response and write the question number and corresponding letter in your answer sheet, in capital letters, e.g.

20. D. Each correct response carries 1 mark.

1. The basic unit of plants and animals is the -----
 - A. Cell
 - B. Chemical
 - C. Organ
 - D. Tissue
2. Which part of cerebral hemispheres helps to control the skeletal muscle movement?
 - A. Mid brain
 - B. Gray matter
 - C. Ganglia
 - D. Limbic system
3. Which part of the brain mediates emotional response?
 - A. Mid brain
 - B. Gray matter
 - C. Ganglia
 - D. Limbic system
4. A term that means "away from the midline" is -----
 - A. Distal
 - B. Lateral
 - C. Medial
 - D. Proximal

5. 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

6. The production and export of milk from mammary gland cells involves which of the following cell organelles?

- A. Lysosomes
- B. Rough endoplasmic reticulum
- C. Golgi apparatus
- D. Vesicles

7. As a result of exercise, there is an increase in the number of ----- in muscle cells.

- A. Nucleus
- B. Mitochondria
- C. Centrioles
- D. Golgi apparatus

8. Transcription takes place in the ----- of a cell

- A. Cytosol
- B. Nucleus
- C. Ribosomes
- D. Mitochondria

9. Working memory _____.

- A. Has limitless capacity
- B. Stores memories immediately and permanently in the long term memory
- C. Stores only 5% of sensory input
- D. Is limited to seven or eight chunks of information

10. Which of the following is the main function of the pons?
- A. Relay information between motor cortex and cerebellum
 - B. controls vomiting and coughing
 - C. regulate body temperature
 - D. Controls breathing
11. The sensory hallucinations experienced by epileptic patients are known as-----
- A. Petit mal seizure
 - B. Absence seizure
 - C. Aura
 - D. Tonic
12. If you are having a conversation with a person, excuse yourself for five minutes, and come back and the person no longer knows you, the person would be suffering from-----
- A. Epilepsy
 - B. Sleep apnea
 - C. Retrograde amnesia
 - D. Anterograde amnesia
13. Which of the following areas is **NOT** involved in speech processing?
- A. Lateral cortex
 - B. Superior colliculi
 - C. Broca's area
 - D. Wernicke's area
14. The following factors influence short term memory to be transferred to long term memory **EXCEPT**-----
- A. Rehearsal
 - B. Association
 - C. Emotional state
 - D. Having too many Alpha waves

15. Which type of brain waves are seen when a person is concentrating on solving a problem
- A. Delta waves
 - B. Beta waves
 - C. Theta waves
 - D. Gamma waves
16. The layer of simple squamous epithelium that lines the inside of the heart is called...
- A. Myocardium
 - B. Pericardium
 - C. Endocardium
 - D. Epicardium
17. Blood transported by the pulmonary veins returns to the.....
- A. Left atrium
 - B. Right atrium
 - C. Right ventricle
 - D. Left ventricle
18. The valve between the left ventricle and the blood vessel leaving the left ventricle is the-----
- A. Bicuspid
 - B. Tricuspid
 - C. Pulmonary semilunar
 - D. Aortic semilunar
19. The valve located between the right atrium and the right ventricle is the-----
- A. Bicuspid
 - B. Tricuspid
 - C. Pulmonary semilunar
 - D. Aortic semilunar

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20. Blood vessels that carry blood away from the heart are called -----
- A. Arteries
 - B. Veins
 - C. Capillaries
 - D. Venules
21. Blood pressure is highest in the.....
- A. Arteries
 - B. Arterioles
 - C. Veins
 - D. Capillaries
22. The presence of excess tissue fluid around cells is called.....
- A. Hypertension
 - B. Edema
 - C. Varicose veins
 - D. Obesity
23. Which of the following can lead to a decreased venous return of blood to the heart?
- A. An increase in blood volume
 - B. An increase in venous pressure
 - C. Damaged to the venous valves
 - D. Increased muscular activity
24. Which of these descriptions of the heart's location is **INCORRECT**?
- A. The heart lies obliquely in the mediastinum.
 - B. Its base is directed towards the left shoulder
 - C. Its apex is directed inferiorly towards the left hip
 - D. Two-thirds of the heart's mass lies to the surface of the midline

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25. Strong connective tissue strings that are attached to papillary muscles and to the cusps of the atrioventricular valves are
- A. Musculi pectinati
 - B. Chordae tendineae
 - C. Trabeculae carnea
 - D. Intraventricular septum
26. The organ that makes estrogen and progesterone is the -----
- A. Hypothalamus
 - B. Ovary
 - C. Vagina
 - D. Pineal gland
27. The reason why the testes are suspended in the scrotum is -----
- A. To reduce chances of infection from the enteric bacteria
 - B. To place sperm storage sites near the penis
 - C. To provide for a cooler temperature
 - D. To create extra space for the sex organs
28. The sperm's acrosome -----
- A. Contains enzymes
 - B. Contains nutrients
 - C. Beats so that the sperm can swim
 - D. Contains compacted DNA
29. The head of a sperm -----
- A. Contains enzymes
 - B. Contains nutrients
 - C. Beats so that the sperm can swim
 - D. Contains compacted DNA

30. The usual site for fertilization is the -----
- A. Ovary
 - B. Vagina
 - C. Uterine tube
 - D. Uterus
31. Which of the following sexual diseases is common in Swaziland?
- A. HIV/AIDS
 - B. Warts
 - C. Gonorrhoea
 - D. Syphilis
32. What is the most correct sequence of sperm flow in the male duct system?
- A. Seminiferous tubules, vas deferens, ejaculatory duct, ampulla, urethra
 - B. Seminiferous tubules, epididymis, vas deferens, ampulla, ejaculatory duct, urethra
 - C. Testes, epididymis, ductus deferens, urethra, seminal vesicle
 - D. Testes, ductus deferens, urethra, seminal vesicle
33. All of the following are true statements about vasectomy **EXCEPT**-----
- A. The ductus deferens that lies in the scrotum is cut
 - B. It is only about 10% reversible
 - C. It is a minor surgical procedure
 - D. It is a highly effective method of birth control
34. Which of the following structures makes up most of the male urethral length?
- A. Ejaculatory duct
 - B. Prostatic urethra
 - C. Spongy urethra
 - D. Membranous urethra

35. Which of the following prostate disorders is more common later in life?
- A. Prostatitis
 - B. Prostate cancer
 - C. Benign prostatic hyperplasia
 - D. Chronic prostatitis
36. Which of the following hormones is **NOT** involved in the regulation of the number of sperms produced in the testes?
- A. Testosterone
 - B. Inhibin
 - C. PSA
 - D. Gonadotrophin releasing
37. Swimmers who voluntarily hyperventilate so to hold their breath longer during swimming are at risk of all the following **EXCEPT**-----
- A. Higher P_{CO_2}
 - B. Oxygen level of below 50 mm
 - C. Black out
 - D. Drowning
38. Which of the following conditions would cause poor lung compliance?
- A. Increased surfactant
 - B. Tuberculosis
 - C. Increased CO_2 in the lungs
 - D. Acute infection of the lungs

39. Airway resistance is insignificant in relationship to gas flow because-----
- A. The gas flow stops in the medium-sized bronchioles and diffusion takes over
 - B. The blood flow is very high in comparison to the viscosity of air
 - C. The airway branch more as they get smaller, resulting in a huge total cross- sectional area
 - D. The airway resistance is not related to the diameter of the conducting tubes
40. Which of the following pressures keeps the air spaces in the lung open?
- A. Intrapulmonary
 - B. Transpulmonary
 - C. Intrapleural
 - D. Atmospheric

Total: 40 marks

SECTION 2

Instructions: In this section, Question 1 is compulsory. Then answer any other two (2) questions in this section.

Question 1

Situation: Your friend at high school has been using drugs (cocaine) for two years now. He told you that this “stuff” is no longer working in his body. You notice that he is anxious and has lost some body weight. He then made a cheap mixture of toxic medications (nyaope) just to quench his cravings.

- A. Under normal circumstances, which neurotransmitter is responsible for the reward system of “feeling good”? (1)
- B. Explain how cocaine produces its effects in the neurons. (4)
- C. What does the exhibition of anxiousness mean to you? (2)
- D. State any two long term effects of using drugs. (2)
- E. Draw a structure of a motor neuron and label the following: (6)
 - i. Dendrites
 - ii. Cell body
 - iii. Axon
 - iv. Node of Ranvier
 - v. Axon terminal branches
 - vi. Nucleus

Situation: You are a health officer at Magubheleni clinic. The community reports a wondering dog that has bitten two young children from school a month ago. Now the children presents with drooling saliva, hallucinations and episodes of barking like a dog.

- F. State the common virus that may cause this condition in these children (1)
- G. Explain how this virus travels to the brain from the injured site to the cell body of the neuron. (1)
- H. Explain any three (3) things you will do to help the community from getting the virus (3)

Total: 20 marks

Question 2

- A. Describe the six (6) major processes that occur during the digestive system activities. (12)
- B. Describe the four (4) functions of saliva. (4)
- C. Explain how the neural and hormonal mechanisms control the gastric secretions. (4)

Total: 20 Marks

Question 3

- A. State the three (3) layers of a blood vessel and their location (6)
- B. Describe the common function of the foramen ovale and the ductus arteriosus in the fetus (4)
- C. State any three (3) problems that may result if these above shunts remain patent (open) after birth. (3)
- D. Draw a structure of the heart intrinsic conducting system and label the following: (7)
- Apex
 - Left atrium
 - Left ventricle
 - Purkinje fibers
 - Sinoatrial (SA) node
 - Atrioventricular (AV) node
 - Atrioventricular bundle (Bundle of His)

Total: 20 marks

Question 4

- A. Describe the phases of the ejaculatory process. (5)
- B. Differentiate between spermatogenesis and oogenesis (2)
- C. Explain how identical twins differ developmentally from fraternal twins. (2)
- D. State the three (3) walls of the uterus (3)
- E. What are the effects of oestrogen (in females) and testosterone (in males) in promoting secondary sex characteristics (8)

Total: 20 marks