



KENYA MEDICAL TRAINING COLLEGE
FACULTY OF DIAGNOSTIC SCIENCES
DEPARTMENT OF RADIOGRAPHY AND IMAGING

END OF SEMESTER EXAMINATION
DIPLOMA IN RADIOGRAPHY AND IMAGING
SEPTEMBER 2024 CLASS

PAPER: ANATOMY AND PHYSIOLOGY (ANP 109)

DATE: 10/02/2025

TIME: 2 HOURS (9-11am)

INSTRUCTIONS

1. This paper consists of:

- Section 1 (40 Multiple Choice Questions)
- Section 2 (8 Short Answer Questions)
- Section 3 (1 Long Answer Question)

2. Attempt **ALL** Questions

3. Write the **COLLEGE NUMBER** given on all the answer sheets provided and on the question paper.

4. Ensure that all examination answer scripts are handed in at the end of the examination

5. Ensure you sign the examination register provided

COLLEGE NUMBER.....

SECTION 1: MULTIPLE CHOICE QUESTIONS

1. Which structure is the simplest level of organization in humans?
 - A. System
 - B. Organ
 - C. Tissue
 - D. Cell
2. Which biomolecule is responsible for insulation and energy storage?
 - A. Protein
 - B. Nucleic Acid
 - C. Lipid
 - D. Carbohydrate
3. The site of protein synthesis is
 - A. Ribosome
 - B. Nucleus
 - C. Endoplasmic reticulum
 - D. Chromosome
4. Synapsis is defined as the pairing of _____
 - A. Acentric chromosomes
 - B. Non-homologous chromosomes
 - C. Any chromosomes
 - D. Homologous chromosomes
5. The tissue responsible for the covering of internal organs and external tissues is known as
 - ~~49~~ A. epidermal tissues
 - ~~10~~ B. muscle tissue
 - 61 C. epithelial tissue
 - ~~52~~ D. nerve tissue
6. The innermost layer of the skin is the
 - A. epidermis
 - B. stratum lucidum
 - C. dermis
 - D. hypodermis
7. The enzyme that governs the lifespan of ageing skin cells is called
 - A. Lipase
 - B. Amylase
 - C. telomerase
 - D. protease
8. The control centre for the regulation of the body's temperature is located in the
 - A. skin.
 - B. hypothalamus.
 - C. thalamus.
 - D. medulla oblongata.

9. During thermoregulation, the body's skeletal muscles act as
A. effectors.
B. receptors.
C. a control centre.
D. stimuli
10. Tissue that is avascular and as a result is slow to heal is _____.
A. Bone
B. Cartilage
C. Epithelial
D. Adipose
11. The epithelial tissue in the urinary bladder that allows it to stretch without tearing is ____
A. Stratified squamous
B. Simple cuboidal
C. Simple columnar
D. Transitional
12. Cervical vertebrae are unique in that they are the only vertebrae
A. With transverse foramina
B. Without transverse processes
C. That do not have true vertebral bodies
D. That have no rib facets
13. Which of The Following Joints Would Allow No Movement?
A. Cartilaginous joint
B. Fibrous joint
C. Synovial joint
D. Ball and Socket joint
14. Spongy bone at the ends of long bones is most important for which function?
A. Fat storage
B. Lymph fluid synthesis
C. White blood cell storage
D. Red blood cell synthesis
15. Which of the following statements regarding glucose is not true?
A. Glucose is a monosaccharide sugar
B. Glucose can be metabolised by both aerobic and anaerobic metabolism.
C. The normal blood glucose concentration is 4-7 mmol/l.
D. A high blood glucose concentration is called hypoglycaemia.
16. In muscle contraction, which ion is essential?
A. Cl
B. Ca
C. K
D. Na

17. Muscles utilized for controlling the flow of all substances within lumen are grouped as?
- A. hormonal system
 - B. skeletal system
 - C. cardiac muscles
 - D. smooth muscles
18. The neuron cell is made up of which of the following parts?
- A. Axon
 - B. Dendrite
 - C. Nucleus
 - D. All of the Above
19. The size of pupil decreases due to the contraction of?
- A. Radial muscles
 - B. Circular muscles
 - C. Both circular and radial muscles
 - D. Nictitating membrane
20. Which part of internal ear receives sound waves in man?
- A. Cochlea
 - B. Legena and utriculus
 - C. Ampullae and utriculus
 - D. None of the above
21. . If all other variables remain constant, which of the following is not true of the amount of fluid that would flow through a vessel?
- A. Doubling its length would result in half as much flow.
 - B. Doubling the viscosity of the fluid would result in half as much flow.
 - C. Doubling the radius of the vessel would result in 4 times more flow.
 - D. Doubling the radius of the vessel would result in 16 times more flow.
22. Which is true of the pulmonary circuit
- A. Blood oxygen content is higher in the pulmonary vein than in the pulmonary artery.
 - B. Blood is pumped through it by the left ventricle.
 - C. Resting blood pressure in the pulmonary artery is normally equal to that in the aorta.
 - D. The cardiac output into the pulmonary circuit is approximately 1/6 of that into the systemic circuit.
23. The largest amount of water comes into the body via _____.
- A. Metabolism
 - B. Foods
 - C. Liquids
 - D. humidified air
24. Hormone release stops when the stimulus that triggered it – like thirst or high blood sugar is satisfied or corrected. This is called:
- A. positive feedback system
 - B. negative feedback system
 - C. lock and key system
 - D. solar system

25. What is the main function of the lymphatic system?
- A. To communicate information about the body's surroundings to the brain
 - B. To distribute oxygenated blood to all parts of the body
 - C. To protect the body from diseases and remove waste products from the cells
 - D. All of the above
26. Peyer's patches are aggregates of lymphatic nodules found in the area of the _____.
- A. tonsils
 - B. appendix
 - C. ileum of the small intestine
 - D. Liver
27. B-cells and T-cells are two types of cells involved in _____.
- A. Innate Immunity
 - B. Active immunity
 - C. Passive immunity
 - D. Acquired immunity
28. A patient comes in with abdominal pain. Their lab results reveal normal levels of pancreatic enzymes, pepsinogen, and both stomach and gall bladder motility, but an acidic small intestine environment. Which hormone is not in balance?
- A. Secretin
 - B. Gastrin
 - C. Leptin
 - D. Cholecystokinin
29. What path do bile salts take?
- A. Gall bladder, stomach, duodenum, tissues, liver
 - B. Liver, gall bladder, duodenum, jejunum, tissues
 - C. Gall bladder, stomach, duodenum, jejunum, ileum, tissues
 - D. Liver, gall bladder, duodenum, jejunum, ileum, liver
30. Select the single most accurate statement about the absorptive area of the human intestine?
- A. The absorptive area is equivalent to that of a tennis court
 - B. All of the options given are correct
 - C. Changes in motility increase the contact time between nutrients and absorptive surface
 - D. The presence of folds, villi and microvilli on the surface of enterocytes magnifies the absorptive area
31. Most of the carbon dioxide produced in the tissues is transported to the lungs as
- A. carbonates
 - B. bicarbonates
 - C. dissolved in the blood
 - D. attached to haemoglobin
32. The alveolar epithelium of lungs is
- A. ciliated squamous
 - B. nonciliated squamous
 - C. nonciliated columnar
 - D. ciliated columnar

33. The location of the kidneys in relationship to the peritoneal lining of the abdominal cavity is referred to as
- Retroperitoneal.
 - Retroabdominal.
 - Posterior.
 - Dorsal.
34. Which of the following is the proper sequence of structures in the nephron?
- Glomerulus, proximal convoluted tubule, distal convoluted tubule, nephron loop.
 - Glomerulus, nephron loop, proximal convoluted tubule, distal convoluted tubule.
 - Glomerulus, proximal convoluted tubule, nephron loop, distal convoluted tubule.
 - Proximal convoluted tubule, glomerulus, nephron loop, distal convoluted tubule.
35. Which of the following is the correct sequence in which urine flows through the kidney toward the urinary bladder?
- Renal pelvis, major calyx, minor calyx, papillary duct, ureter.
 - Papillary duct, minor calyx, major calyx, renal pelvis, ureter.
 - Minor calyx, major calyx, papillary duct, renal pelvis, ureter.
 - Papillary duct, major calyx, minor calyx, ureter, renal pelvis.
36. Which blood type can be given to a patient who is blood group O?
- A
 - B
 - AB
 - O
37. Osmoreceptors detect a decreased blood volume and increased blood concentration of salt and stimulate:
- increased kidney activity
 - increased salivary secretions
 - thirst
 - increased secretion of progesterone
38. In the menstrual cycle, lowering which hormone causes menstruation
- Progesterone
 - Thyroxine
 - Oestrogen
 - Follicle stimulating hormone
39. Which of the following is the correct sequence regarding the flow of sperm cells?
- epididymis, seminiferous tubules, ductus deferens
 - ductus deferens, epididymis, seminiferous tubules
 - seminiferous tubules, epididymis, ductus deferens
 - seminiferous tubules, ductus deferens, epididymis

40. Which of the following statements is true?

Impaired foetal growth is described as intrauterine growth retardation (IUGR). IUGR has the same definition as:

- A. Low birthweight (LBW)
- B. very low birthweight (VLBW)
- C. birth weight below a population threshold for gestational age
- D. pre-term birth

SECTION 2: SHORT ANSWER QUESTIONS

- 41. One of the main functions of connective tissue is to integrate organs and organ systems in the body. Discuss how blood fulfils this role. (5mks)
transported through the body.
- 42. Briefly describe five types of movements in joints. (5mks)
- 43. Briefly describe the phases of the menstrual cycle (5mks)
- 44. Outline 5 adaptations of the alveoli to its function (5mks)
- 45. Briefly explain the processes involved in protein synthesis (5mks)
- 46. List 5 glands of the endocrine system (5mks)
- 47. i) Name the derivative body tissue that makes up bones-
Connective tissue (1mk)
ii) Describe the process of bone repair and remodelling (4mks)
- 48. Discuss changes that occur in cells as a person ages.

SECTION 2: LONG ANSWER QUESTION

- 49. Discuss the feedback mechanisms involved in homeostasis. Give examples. (20mks)