UNIVERSITI KUALA LUMPUR
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

FINAL EXAMINATION

OCTOBER 2025 SEMESTER

COURSE CODE	:	HGD10303
COURSE TITLE	:	HUMAN ANATOMY AND PHYSIOLOGY
PROGRAMME NAME	:	DIPLOMA IN ENVIRONMENTAL HEALTH
DATE	:	23 JANUARY 2026
TIME	:	9:00AM - 12:00PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Section A consist 25 MCQ or EMQ questions. Answer ALL questions.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. ☐ *Tick if applicable*
9. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

THERE ARE 15 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 25 marks)

Answer ALL questions.

Please use the objective answer sheet provided.

1. Damage to the sarcoplasmic reticulum would directly affect the _____.

   A. protein synthesis

   B. tropomyosin structure

   C. myosin head binding to actin

   D. storage and release of calcium

2. The epidermis is composed of _____ epithelium.

   A. simple cuboidal

   B. transitional

   C. pseudostratified

   D. stratified squamous

3. Which of the following layers of the skin contain melanocytes?

   A. Hypodermis

   B. Stratum corneum

   C. Dermis

   D. Stratum basale

4. Ribosomes function mainly in the _____.

   A. lipid digestion

   B. energy production

   C. DNA repair

   D. protein synthesis

5. The wrist is _____ to the elbow.

   A. superior

   B. lateral

   C. distal

   D. proximal

6. The protein that binds calcium during muscle contraction is _____.

   A. myosin

   B. tropomyosin

   C. actin

   D. troponin

7. The shaft of a long bone is called the _____.

   A. endosteum

   B. metaphysis

   C. epiphysis

   D. diaphysis

8. Compact bone is organized into repeating units called the _____.

   A. lacunae

   B. osteons

   C. trabeculae

   D. perforating canals

9. What is the function of the lymph node?

   A. Stores platelets.

   B. Serves as a site of T cell death.

   C. Filter and destroy foreign substances in the lymph.

   D. Remove worn-out, defective blood cells and platelets.

10. Which hormonal change triggers ovulation in the female reproductive cycle?

   A. Decrease in estrogen

   B. Increase in inhibin

   C. Surge in luteinizing hormone

   D. Gradual rise in progesterone

11. Which cell type in the testes is responsible for spermatogenesis?

   A. Leydig cells

   B. Spermatogonia

   C. Sertoli cells

   D. Peritubular myoid cells

12. Which nephron type is primarily responsible for concentrating urine?

   A. Medullary nephron

   B. Cortical nephron

   C. Pyramidal nephron

   D. Juxtamedullary nephron

13. Which renal mechanism plays the greatest role in long-term regulation of blood pressure?

    A. Myogenic response

    B. Tubuloglomerular feedback

    C. Autoregulation of renal blood flow

    D. Renin–angiotensin–aldosterone system

14. Which digestive enzyme is active in the oral cavity?

    A. Pancreatic lipase

    B. Pancreatic amylase

    C. Gastric pepsin

    D. Salivary amylase

15. Which process primarily moves food along the gastrointestinal tract?

    A. Segmentation

    B. Contraction

    C. Peristalsis

    D. Migrating motility complexes

16. A decrease in lung compliance will result in _____.

    A. easier lung expansion

    B. increased tidal volume

    C. increased work of breathing

    D. decreased airway resistance

17. Which muscle is the main driver of quiet inspiration?

    A. Internal intercostals

    B. External oblique

    C. Diaphragm

    D. Sternocleidomastoid

18. Which component of the electrocardiogram (ECG) corresponds to ventricular depolarization?

    A. PR interval

    B. QRS complex

    C. T wave

    D. P wave

19. Which structure normally initiates the electrical impulse in the heart?

    A. Sinoatrial (SA) node

    B. Atrioventricular (AV) node

    C. Purkinje fibers

    D. Bundle of His

20. High levels of circulating thyroid hormones suppress the Thyroid Stimulating Hormone (TSH) release. This phenomenon is primarily an example of _____ mechanism.

    A. feed-forward control

    B. hormone amplification

    C. negative feedback

    D. positive feedback

21. The adrenal cortex primarily secretes _____.

A. epinephrine

B. cortisol

C. norepinephrine

D. acetylcholine

22. The sympathetic nervous system is most active during _____.

A. emergencies

B. relaxation

C. sleep

D. digestion

23. The somatosensory cortex primarily receives input from the _____.

A. tongue

B. eyes

C. ears

D. receptors for touch

24. The organ of Corti is responsible for detecting _____.

A. rotational movement

B. gravity

C. acceleration

D. sound vibrations

25. Olfactory receptors respond to _____.

A. light waves

B. mechanical forces

C. sound waves

D. chemical molecules

SECTION B (Total: 75 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

The skeletal and muscular systems work in unison to provide support, movement, and protection for the human body.

(a) Suggest the FIVE (5) types of bone classification based on their shape and give ONE (1) example for each type of bone.

(5 marks)

(b) The figure below shows the histology of compact bone tissues. Identify the labeled structure.

Refer Below - Figure1 : Bone tissue. .

(5 marks)

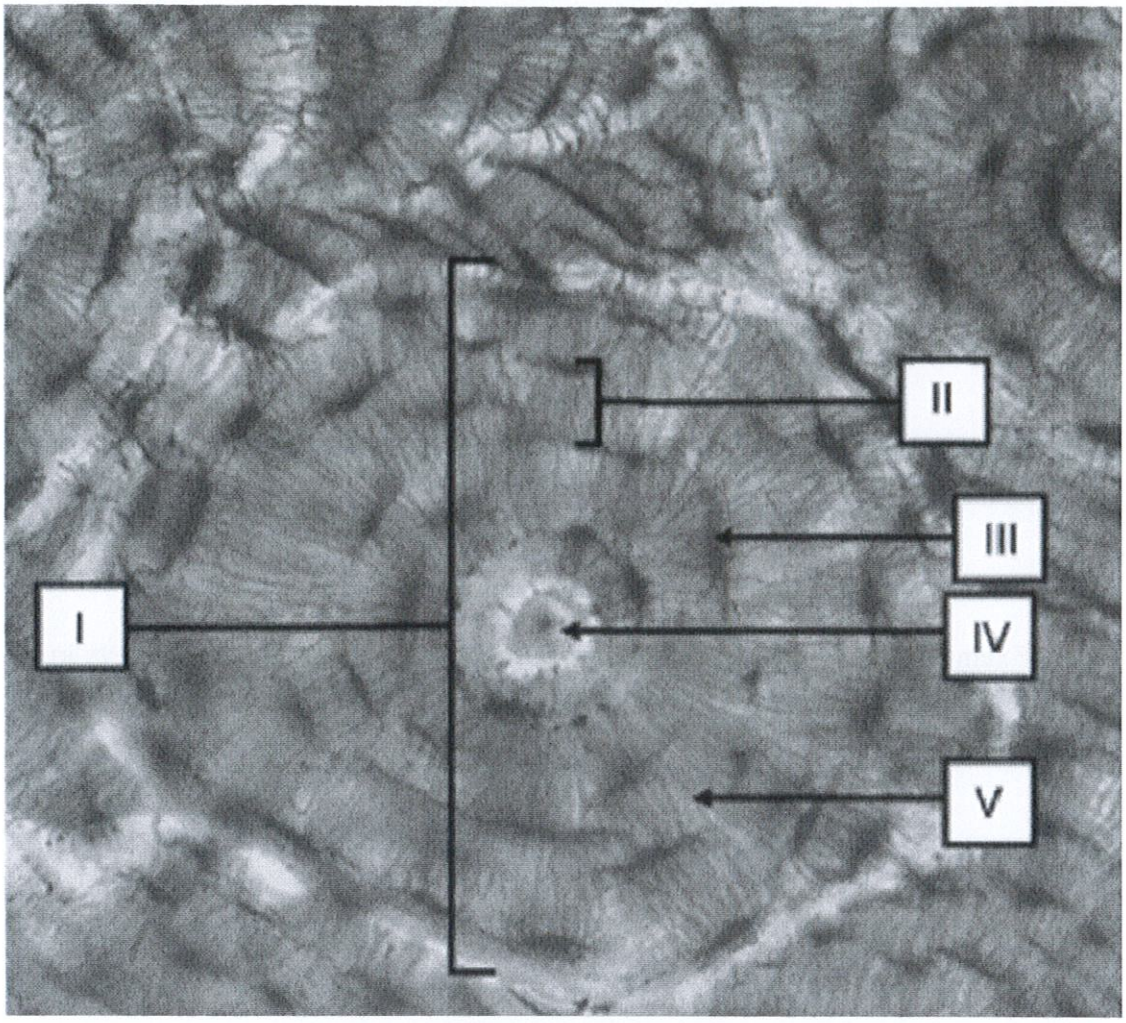

Figure 1: Bone tissue.

(c) Illustrate and label the structure of a sarcomere within a myofibril of skeletal muscle.

(5 marks)

(d) Describe the process of excitation-contraction coupling of the skeletal muscle.

(10 marks)

Question 2

The endocrine system regulates vital bodily processes through the secretion of hormones.

(a) Explain the differences between endocrine glands and exocrine glands.

(6 marks)

(b) Describe the two hormones secreted by the pancreas and their regulation of the blood sugar levels.

(4 marks)

(c) Examine the interactions between the endocrine glands and the kidneys in the regulation of blood calcium levels.

(15 marks)

Question 3

The heart is a vital, fist-sized muscular organ that acts as the body's pump, circulating oxygen-rich blood and nutrients to tissues and removing waste, powered by its own electrical system within the circulatory system.
Using the figure below, answer the following questions.
Refer Below - Figure2 : The heart. .

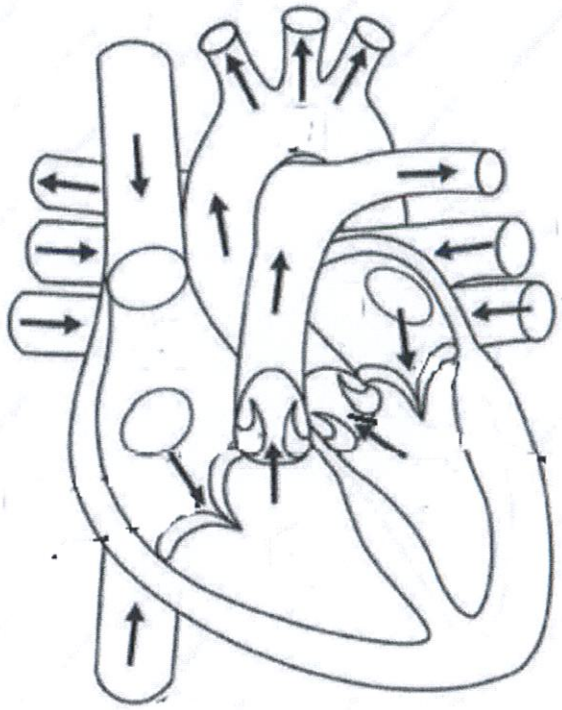

Figure 2: The heart.

(a) List the four major blood vessels of the heart.

(4 marks)

(b) List the two types of valves with two examples for each type.

(6 marks)

(c) Illustrate and explain the pulmonary and systemic circulation of blood flow in the heart.

(10 marks)

(d) Explain the differences in myocardial thickness between the right and left ventricles.

(5 marks)

Question 4

The human reproductive system, distinct in males and females, produces gametes, hormones, enables fertilization, and supports fetal development.

(a) Label the diagram.
Refer Below - Figure3 : Male reproductive system. .

(6 marks)

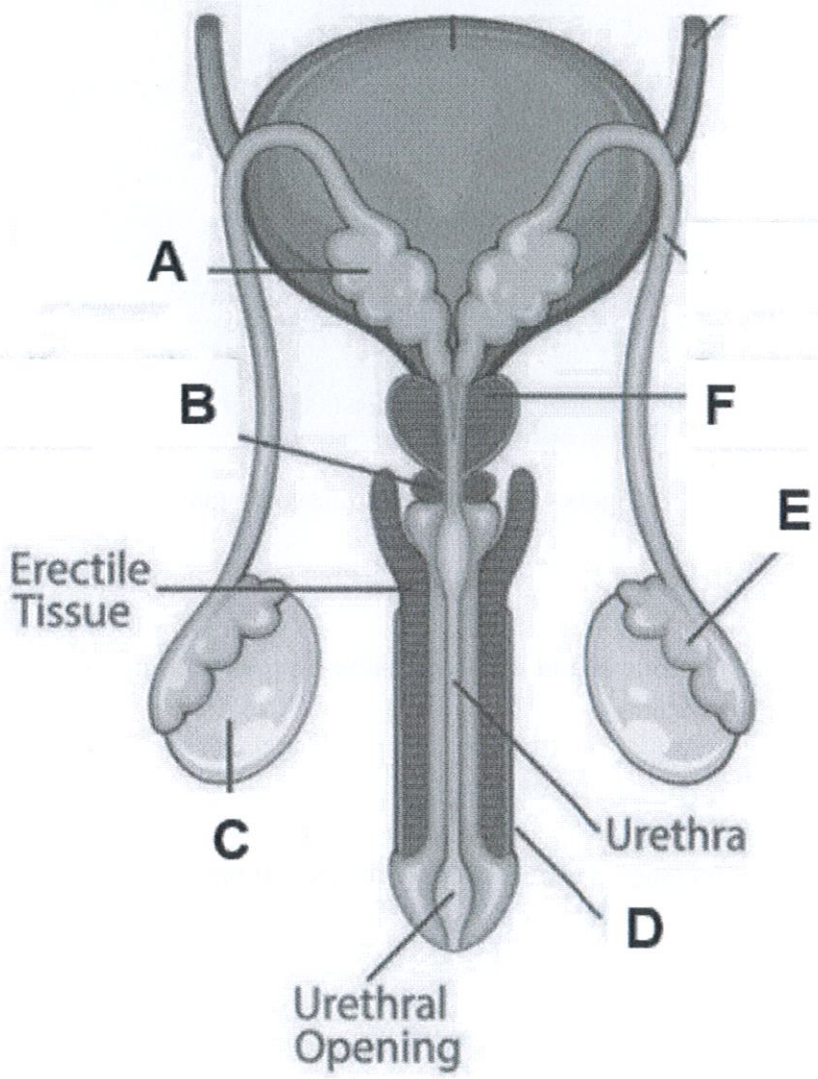

Figure 3: Male reproductive system.

(b) Label the diagram.

Refer Below - Figure4 : Female reproductive system. .

(5 marks)

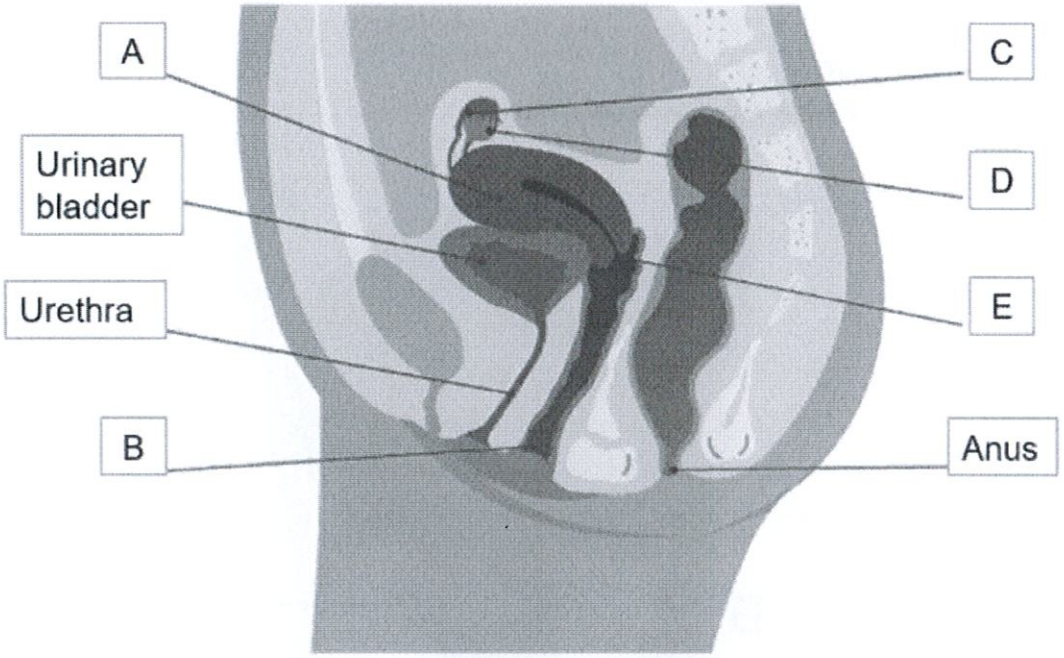

Figure 4: Female reproductive system.

(c) Compare the process and organ of gamete production in the male and female reproductive systems.

(4 marks)

(d) Explain the secretion and effects of hormones that regulate the female reproductive cycles.

(10 marks)

END OF EXAMINATION PAPER