This test consists of two papers; Paper I will consist of Gross Anatomy questions and Paper II of Histology and Embryology questions.

Instructions:
1. Answer all questions.
2. Write your Anatomy number on each answer book/MCQ sheet.

SECTION A: MCQ’s                         60 MARKS

i) Write your name, the degree for which you are registered, your student number, and anatomy test number on the “Faculty of Health Sciences” side of the computer sheet.

ii) On the “circles” side of the computer sheet in the block headed “student number” write your student number. Fill in the circles with a soft HB pencil.

iii) There is one type of MCQ question in this paper:

   X-Type:

   ➢ For this type of question there are five (5) options each must be marked as either CORRECT or INCORRECT. For each question at least one of the options will be correct and one incorrect.

   ➢ This MCQ type carries negative marking; therefore leave the circle(s) blank if you do not know the answer – marks will be deducted for statements incorrectly answered.

   iv) DO NOT use CORRECTION FLUID on your MCQ sheet. You may use an eraser with care.

   v) DO NOT fold or bend the computer card.

   vi) The computer sheet MUST be filled in during the examination time. NO TIME WILL BE ALLOWED after the end of the examination for filling in the sheet.

   vii) Gross Anatomy questions are from 1 to 18, and Histology and Embryology questions are from 19 to 30. The answers for both sections are to be filled into the same computer card. PLEASE BE CAREFUL TO ANSWER AT THE CORRECT NUMBERS.

SECTION B : WRITTEN ANSWER QUESTIONS :         40 MARKS

i. Answer all Gross Anatomy questions in the COLOURED book and all Histology questions in the WHITE book.

ii. Relevant and correctly labelled diagrams may be used to enhance your answers.

iii. ONLY scripts written in blue or black ink will be marked. Pencil may be used ONLY for drawings, while all labels should be written in pen.
1. **The trigeminal nerve:**
   a. carries sensory information from the entire face and scalp.
   b. has four main subdivisions.
   c. provides motor innervation to the muscles of mastication.
   d. emerges from the brainstem at the level of the rostral medulla.
   e. has the largest diameter of all the other cranial nerves.

2. **With respect to the palate:**
   a. the bony hard palate comprises the palatine processes of the maxillary bone and the horizontal processes of the palatine bone.
   b. the nasopalatine nerves pass from the nose through a canal that open into the incisive fossa.
   c. the lesser palatine nerve and vessels emerge from the greater palatine foramen and run anteriorly.
   d. the mucosa covering the hard palate receives its sensory innervations from the anterior superior alveolar nerve.
   e. the palatine aponeurosis originates from the tendon of the right and left tensor veli palatini muscles, that meet in the midline.

3. **The boundaries of the nasal cavity include:**
   a. the roof subdivided into the frontonasal, ethmoidal and sphenoidal divisions
   b. the floor formed by the inferior nasal concha
   c. the medial wall formed by the nasal septum
   d. the lateral walls formed by the nasal conchae
   e. the inferior surface formed by the palatine process of the maxillary bone and the horizontal plate of the palatine bone

4. **The cerebellum:**
   a. is bounded superiorly by the tentorium cerebelli
   b. is divisible into three functional components
   c. is contained within the middle cranial fossa
   d. is responsible for unconscious proprioception
   e. contains the red nucleus

5. **The following structures create impressions on the mediastinal surface of the left lung:**
   a. azygos vein
   b. arch of aorta
   c. inferior vena cava
   d. superior vena cava
   e. lingula
6. With regard to the meninges
   a. the pia matter is the intermediate layer between the outer and innermost layers.
   b. the dura matter is the most durable of the three.
   c. the arachnoid matter does not follow the brain into each sulcus.
   d. the dura contains the granulations responsible for cerebrospinal fluid re-absorption.
   e. the pia matter follows the brain’s surface into every sulcus.

7. With respect to the temporomandibular joint:
   a. it is a modified hinge type synovial joint.
   b. the coronoid process of the ramus of the mandible is one of its articular surfaces.
   c. its articular disc consists of hyaline cartilage.
   d. the stylomandibular ligament is a thickening of the investing deep cervical fascia surrounding the parotid gland.
   e. the main sensory innervation to the articular capsule originates from the auriculotemporal nerve.

8. With respect to the tongue:
   a. the mucosa covering the anterior surface of the dorsum of the tongue receives its general sensory innervation from the lingual nerve.
   b. the mucosa covering the anterior surface of the dorsum of the tongue receives its special sensory innervations from the glossopharyngeal nerve.
   c. the motor innervation to all the muscles of the tongue is from hypoglossal nerve.
   d. all the muscles of the tongue except the palatoglossal muscle originate from the occipital myotomes.
   e. taste from the anterior 2/3 part is conveyed through the facial nerve.

9. With regards to the external carotid artery:
   a. it originates directly from the brachiocephalic trunk on the right and the aortic arch on the left.
   b. it originates from the common carotid artery on both sides, at the level of the 6th cervical vertebra.
   c. the hypoblossal nerve hooks around the origin of its occipital branch in the carotid triangle.
   d. its terminal branches are the ophthalmic and the facial arteries.
   e. it provides blood supply to the cerebrum.

10. With regards to the maxillary artery:
    a. it originates from the external carotid artery, posterior to the mandibular condyle.
    b. it is divided into three parts by the medial pterygoid muscle.
    c. the inferior alveolar artery originates from the 3rd part of the maxillary artery and supplies the mandibular teeth.
    d. the middle meningeal artery originates from the 1st part of the maxillary artery and enters the skull through foramen spinosum.
    e. the veins corresponding to all the branches of the maxillary artery form the pterygoid plexus of veins in the infratemporal fossa.
11. With respect to the nasal cavity:
   a. the septum of the nasal cavity is formed in the living, by the perpendicular plate of the ethmoid bone anteriorly and the vomer posteriorly.
   b. the superior and middle nasal conchae of its lateral wall extend from the sphenoid bone.
   c. the only structure that drains into the inferior nasal meatus is the nasolacrimal duct.
   d. the Kiesselbach plexus is the plexus of anastomoses of all the arteries that supply the nasal cavity and is found on the anterior part of the nasal septum.
   e. The glands of the nasal cavity receive their preganglionic secretomotor innervation from the occulomotor nerve.

12. With respect to the anterior thoracic wall:
   a. it is entirely supplied by the internal thoracic artery which originates from the 1st part of the subclavian artery.
   b. the external intercostal muscle is the most superficial muscle and continues at the level of the costochondral cartilage as the external intercostal membrane.
   c. the typical intercostal nerve enters the intercostals groove at the level of angle of the rib and it lies just inferior to the intercostals arteries.
   d. the sternal angle is palpable at the manubriosternal joint and lies at the intervertebral disc between T4 and T5.
   e. the intercostal nerves comprise the posterior primary rami of the thoracic spinal nerves.

13. With respect to the azygos vein:
   a. it drains the anterior walls of the thorax and the abdomen.
   b. it ascends in the left side of the posterior mediastinum close to the bodies of the inferior 8 thoracic vertebrae.
   c. its main tributary is the hemiazygos vein which drains into it at the level of T8/T7.
   d. it arches over the superior aspect of the left lung to drain into the superior vena cava.
   e. it is formed by the junction of right ascending lumbar veins and the right subcostal vein at the level of T12.

14. With respect to the posterior mediastinum:
   a. the thoracic duct originates from the cisterna chili and ascends in the right side, anterior to the bodies of the inferior 7 vertebrae.
   b. the thoracic aorta descends on the right side of the bodies of the thoracic vertebrae and pierces the diaphragm at the level of the T8.
   c. the eosophagus lies to the left of the vertebral bodies and enters the abdomen at the level of T10.
   d. all the posterior intercostal arteries originate from the superior intercostal artery, a branch of the costocervical trunk.
   e. It is a subdivision of the superior mediastinum.
15. With respect to the trachea:
   a. it originates at the level of the 6th cervical vertebra inferior to the cricoid cartilage.
   b. it consists of C-shaped rings of fibrocartilage joined posteriorly by the trachealis muscle.
   c. it consists of C-shaped rings of hyaline cartilage joined posteriorly by the trachealis muscle.
   d. it terminates at the level of the intervertebral disc between T4/T5 as it divides into the right and left primary bronchi.
   e. The recurrent laryngeal nerve ascends on each side in the groove between the oesophagus and the trachea in the neck.

16. With respect to the blood supply of the heart:
   a. the right and left coronary arteries originate directly from the arch of the aorta.
   b. the anterior interventricular artery originates from the left coronary artery and runs between the right and left ventricles.
   c. the great cardiac vein drains the areas of the heart supplied by the left coronary artery and drains into the superior vena cava.
   d. the great cardiac vein drains the areas of the heart supplied by the left coronary artery and drains into the coronary sinus.
   e. the coronary sinus drains all the chambers of the heart and empties into the right atrium.

17. The midgut:
   a. begins at the oesophageal sphincter.
   b. includes the jejunum.
   c. includes the caecum.
   d. is supplied by the superior mesenteric artery.
   e. is innervated by divisions of the coeliac plexus and ganglia.

18. The stomach:
   a. has a greater curvature which faces the liver.
   b. has a pyloric sphincter which lies superiorly.
   c. has a fundus which lies superiorly.
   d. is innervated by the phrenic nerve.
   e. is primarily vascularized by the superior mesenteric artery.
SECTION B: SHORT QUESTIONS  

QUESTION 1

Describe the anatomy of the thyroid gland  

(10 marks)

QUESTION 2

A) List the anatomical structures that are impressed on the mediastinal surface of the right lung. Illustrate your answer with a fully labeled diagram.

(6 marks)

B) Describe the left coronary artery of the heart.

(4 marks)

QUESTION 3

Draw a well-labeled diagram of the arterial Circle of Willis  

(4 marks)
PAPER 2: HISTOLOGY & EMBRYOLOGY 40 MARKS

SECTION A: MULTIPLE CHOICE QUESTIONS 24 MARKS

19. With regard to the nucleus:
   a. Euchromatin is indicative of an “active” cell
   b. Chromatin is condensed in dividing cells
   c. The Barr body can be used to identify the sex of a fetus
   d. Nucleoli function in cell cycle regulation
   e. The nuclear envelope remains intact during cell division

20. A skeletal muscle fibre:
   a. Is multinucleated
   b. Is comprised of many cells
   c. Is surrounded by endomysium
   d. Requires Ca^{2+} for contraction
   e. Exhibits a regular array of actin filaments

21. The dermis found in thick skin:
   a. Consists of dense regular connective tissue
   b. Is separated from the epidermis by a basement membrane
   c. Contains epidermal derivatives
   d. Contains smooth muscle
   e. Forms the rete pegs

22. With regard to compound glands:
   a. Mucous secretory cells have “spherical, centrally placed nuclei”
   b. Serous secretory cells have “flattened, basally placed nuclei”
   c. They are characterised by a branched duct system
   d. They are multicellular
   e. One location is the oesophageal submucosa

23. With regard to a peripheral nerve:
   a. The epineurium is composed of a loose connective tissue
   b. The perineurium surrounds each nerve fascicle
   c. All axons are myelinated
   d. Oligodendrocytes are responsible for myelination
   e. The nodes of Ranvier are devoid of myelin

24. With regard to the kidney:
   a. Medullary rays are found in the cortex
   b. Macula densa is the terminal portion of the proximal convoluted tubule
   c. Capillaries found in the renal corpuscle are discontinuous
   d. The parietal layer of the Bowman’s capsule consists of simple squamous epithelium
e. The glomerular basement membrane allows for free diffusion of particles

25. With regard to olfactory mucosa:
   a. The epithelium is classified as “pseudostratified ciliated columnar epithelium”
   b. The olfactory cells are pseudounipolar neurons
   c. Olfactory or Bowman’s glands are serous secreting glands
   d. It has a distinct “thick” basement membrane
   e. Sustentacular or supporting cells function in immunologic support

26. White pulp of the spleen:
   a. Consists of lymphatic tissue
   b. Contains a central artery
   c. Contains splenic sinuses
   d. Reacts to lymph-borne antigens
   e. Is circumscribed by marginal sinuses

27. Loose areolar connective tissue:
   a. Is associated with glands
   b. Is the functional component of tendons
   c. Has abundant ground substance
   d. Is highly cellular
   e. Is vascular

28. The permanent kidney is formed by:
   a. Ureteric bud and metanephric mesoderm
   b. Pronephric duct
   c. Mesonephric duct
   d. Intermediate mesoderm
   e. Mesonephros

29. Transitional epithelium:
   a. Has “dome shaped surface cells” in the relaxed state
   b. Has “plaques” in the plasma membrane
   c. Is a stratified epithelium
   d. Has a brush border
   e. Is impermeable to salts and water

30. Arterioles:
   a. Have discontinuous endothelium
   b. Regulate the flow of blood into capillaries
   c. Have pericytes in their walls
   d. Have a prominent external elastic lamina
   e. Do not have a tunica media
SECTION B: SHORT ESSAY QUESTIONS 16 MARKS

QUESTION 1

Describe the histological structure and function of the tracheal mucosa. (6 marks)

QUESTION 2

Describe the histological structure of a Fundic/Gastric gland. In your answer make reference to the different cell types seen in this gland and their function. (5 marks)

QUESTION 3

a. Briefly describe the changes that occur in the atria of the heart at birth when the lungs become functional. (4 marks)

b. Give the adult remnants which are the result of these changes. (1 mark)