FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA

SECOND EXAMINATION FOR MEDICAL DEGREES – MAY 2023

ANATOMY PAPER II ESSAY

Answer all five questions
Use illustrations where necessary
Answer each question in a separate booklet

2.00-5.00 p.m. (Three hours)
23rd of May 2023

1.

1.1 A 14-year-old boy is admitted to the surgical casualty unit with severe pain and difficulty in moving right elbow joint following a fall on an outstretched hand. Clinical features of median nerve injury are noted on examination of the forearm and hand. The X ray of the elbow shows supracondylar fracture of the humerus.

1.1.1 What is the name given to the deformity of the hand which develops due to this nerve injury? (10 marks)

1.1.2 List the muscles that are paralyzed in his right forearm and hand. (20 marks)

1.1.3 What is the area of sensory loss? (10 marks)

1.1.4 Draw a labeled diagram to show the light microscopic appearance of a cross section of the shaft of the humerus. (20 marks)

1.2 A 60-year-old man is admitted to the surgical casualty unit with a deep cut injury to the middle of the leg. On examination, he is unable to extend his toes and dorsiflexion of the foot is lost. Both inversion and eversion were noted to be weak. His plantar flexion is normal. Surgical exploration of the wound shows complete cut of all the structures in one compartment.

1.2.1 What is the injured compartment? (10 marks)

1.2.2 Name the injured muscles, nerve and the artery. (10 marks)

1.2.3 Explain the course and distribution of the nerve you stated in 1.2.2. (20 marks)

2. A 60-year-old man who presents with epigastric burning pain and difficulty in swallowing solids undergoes upper gastrointestinal tract endoscopy which shows an inflamed gastro-esophageal junction.

2.1

2.1.1 What is the distance from incisor teeth to the gastro-esophageal junction? (10 marks)

2.1.2 List **three** sites of anatomical constrictions of the esophagus that the endoscope has to pass through during the procedure. (15 marks)

2.2 List **two** anatomical relations for each anterior, posterior, right & left sides of the thoracic esophagus. (20 marks)

2.3 List **three** arteries that supply the esophagus. (15 marks)

2.4 List **three** histological features of the gasrtoesophageal junction. (15 marks)

2.5 State the embryological development of the diaphragm under the following headings.
(a). embryonic germ layer (b). embryological components (c). two sites of congenital herniae and the defective embryological component for each. (25 marks)

3. A 32-year-old woman in her 8th week of pregnancy is admitted to the emergency department with a complaint of severe lower abdominal pain. Examination reveals tenderness in the suprapubic and right iliac regions. An ultrasound scan shows an enlarged uterus with an empty cavity and collection of blood in the recto-uterine pouch (pouch of Douglas) in supine position. A ruptured tubal pregnancy is diagnosed.

3.1 List **five** visceral organs that are located in the right iliac region. (10 marks)

3.2 State the anatomical basis for collection of blood in the recto-uterine pouch in supine position. (10 marks)

3.3 List the boundaries and contents of the recto-uterine pouch. (20 marks)

3.4 State the arterial supply and venous drainage of the right uterine tube including the site/s of origin/drainage of the vessels. (20 marks)

3.5

3.5.1 Draw a labeled diagram to show the components of an early blastocyst. (10 marks)

3.5.2 List the tissue layers of the placental barrier that separate foetal and maternal blood. (10 marks)

3.6 List **three** histological features of the mucosa of the uterine tube and indicate their functional significance. (20 marks)

4. A 5-year-old girl presents with features suggestive of acute otitis media following an upper respiratory tract infection. Examination of the external ear with an otoscope reveal bulging and redness of the tympanic membrane.

4.1

4.1.1 State the pathway of spread of an infection from the upper respiratory tract to middle ear. (10 marks)

4.1.2 List **one** structure/area that could be involved if the middle ear infection spreads (a) laterally, (b) superiorly, (c) inferiorly and (d) posteriorly. (20 marks)

4.1.3 What is the outcome of involvement of the structure you stated in 4.1.2 (d)? (05 marks)

4.2 List **two** anatomical features that should be considered when examining the tympanic membrane of a newborn. (20 marks)

4.3 State the embryological components that form (a) external auditory meatus, (b) middle ear cavity, (c) malleus, (d) incus and (e) stapes. (25 marks)

4.4 List **four** microscopic features of the cartilage that form the external acoustic meatus. (20 marks)

5. A 42- year-old patient with hypertension, recent history of hoarseness and difficulty in swallowing develop sudden onset of vertigo and nystagmus. On examination, loss of pain and temperature sensations on the left half of the face and the right side of the body below the neck are detected. A vascular lesion involving the brainstem is diagnosed.

5.1

5.1.1 Name the specific structure damaged leading to (a) loss of pain and temperature sensations in the left side of the face, (b) loss of pain and temperature sensations in the right side of the body below the neck, (c) vertigo and nystagmus and (d) difficulty in swallowing and hoarseness. (20 marks)

5.1.2 What is the blood vessel affected in this patient? (05 marks)

5.1.3 State the site of the lesion in the brainstem. (10 marks)

5.1.4 Draw a cross section of the site of the lesion indicating the structures you stated in 5.1.1 (15 marks)

5.2 List the parts of the neural tube and the component of the adult brain that arises from each part of the neural tube. (25 marks)

5.3 Describe briefly the light microscopic appearance of a muscular artery. (25 marks)

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