



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF
BACHELOR OF SCIENCE IN CLINICAL MEDICINE/COMMUNITY HEALTH
THIRD SEMESTER 2021/2022
[JUNE-SEPTEMBER, 2022]

ANAT 102: ANATOMY OF THE THORAX, ABDOMEN, PELVIS & PERINEUM

STREAM: Y1S3

TIME: 3 HOURS

DAY: THURSDAY, 3:00 – 5:00 PM

DATE: 15/09/2022

INSTRUCTIONS

1. Do not write anything on this question paper.

SECTION A: MULTIPLE CHOICE QUESTIONS

Specialized connective tissues 5 MCQS

Question 1-6

Match the following facts (1-6) with the appropriate specialized connective tissue (labelled A-E)

1. The extracellular matrix of this tissue is liquid
2. The thyroid gland influences the metabolism of this tissue
3. The cells of this tissue include chondroclasts that remodel it under the influence of mechanical forces
4. This tissue conforms with the cells-ground substance-fibers principle of all connective tissues
5. This tissue is an important store of calcium in the body
6. This tissue is responsible for resilience of the skeleton to repeated mechanical stress

- A. Bone
- B. Cartilage
- C. Blood
- D. Fat
- E. All the above

Question 7-11

Match the following functions, numbered 7-11, with the appropriate structure in the skin that performs them (labelled A-E)

7. Protection from ultraviolet radiation
8. Insulation and energy storage
9. Prevention of water loss and waterproofing
10. Regulation of body temperature
11. Excretion of water, salts and urea
 - A. Hypodermis
 - B. Melanocytes
 - C. Sweat glands
 - D. Stratum corneum
 - E. Blood vessels in the dermis
12. One of the following hormones is excreted by neurons
 - A. Insulin
 - B. Cortisol
 - C. Oxytocin
 - D. Growth hormone
 - E. Thyroxine
13. The following hormones have influence on glucose metabolism except one
 - A. Growth hormone
 - B. Thyroxine
 - C. Adrenocorticotrophic hormone
 - D. Insulin
 - E. Parathyroid hormone
14. The following are true of the adrenal gland except
 - A. The adrenal cortex secretes glucocorticoids, mineralocorticoids and gonadocorticoids
 - B. The adrenal medulla behaves akin to a ganglion of the sympathetic nervous system
 - C. The adrenal cortex is divided into five zones
 - D. The adrenal gland is situated on the superior pole of the kidney in the retroperitoneum
 - E. The hypothalamus and anterior pituitary gland exert hormonal influences on adrenal function
15. The following are true of the pineal gland except
 - A. The primary cell type is the pinealocyte
 - B. Hormone release in the pineal gland is dependent on declining levels of sunlight
 - C. The pineal gland releases serotonin hormone
 - D. The hormone released by the pineal gland is important in regulating the sleep-wake cycle
 - E. The pineal gland exhibits calcification with increasing age
16. The following is true of cell types in the pancreas
 - A. Alpha cells secrete insulin
 - B. Beta cells secrete insulin
 - C. Delta cells secrete glucagon
 - D. Theta cells secrete digestive enzymes
 - E. V cells secrete vascular intestinal peptide

17. The conducting portion of the respiratory systems includes all the following except
- A. Pharynx
 - B. Alveolus
 - C. Secondary bronchi
 - D. Trachea
 - E. Larynx
18. A thoracocentesis needle passed through the 4th intercostal space within the triangle of safety will penetrate the layers of the thoracic wall in the following order
- A. Skin, superficial fascia, deep fascia, endothoracic fascia, visceral pleura
 - B. Skin, fascia, intercostal muscles, parietal pleura
 - C. Skin, intercostal muscles, parietal pleura
 - D. Skin, superficial fascia, deep fascia, intercostal muscles, endothoracic fascia, parietal pleura
 - E. Skin, intercostal muscles, endothoracic fascia, pleural cavity
19. The following regarding the microscopic anatomy of the respiratory portion of the airway is true
- A. The alveolar membrane is one cell thick
 - B. There is abundant pseudostratified columnar epithelium with cilia
 - C. Basal cells provide nutrition to overlying cells
 - D. Granule cells contain mucous granules that are released in response to dust
 - E. Brush cells of the respiratory epithelium serve a sensory receptor function
20. The following cartilages are components of the laryngeal skeleton except
- A. Hyoid cartilage
 - B. Thyroid cartilage
 - C. Arytenoid cartilages
 - D. Cricoid cartilage
 - E. Epiglottis
21. The following is false regarding the structure of the nose
- A. The nostrils open into the vestibule of the nose
 - B. The olfactory mucosa is rich in stem cells
 - C. The turbinate bones are important for creating turbulence, humidifying and warming incoming air
 - D. The nasal septum is deviated to the left in normal anatomy
 - E. The posterior openings of the nose into the nasopharynx are related to the tubal and pharyngeal tonsil
22. The following is true of the structure of blood vessels except
- A. The tunica intima comprises endothelium resting on a basement membrane
 - B. The tunica media of the aorta is rich in elastin
 - C. Compared to arteries, veins have a thicker tunica externa
 - D. Precapillary sphincters in arterioles regulate blood flow into capillary beds
 - E. Systemic hypertensive disease causes no structural changes in the walls of arteries

23. The following is false concerning the valves of the heart
- A. Blood flowing out of the right ventricle flows through a tricuspid semilunar valve
 - B. Blood flowing out of the left ventricle of the heart flows through a tricuspid semilunar valve
 - C. Blood flowing into the right ventricle of the heart flows through a tricuspid valve
 - D. Blood flowing into the left ventricle of the heart flows through the mitral valve
 - E. The right atrioventricular valve has two cusps
24. The following is true regarding the mediastinum
- A. It is divided into superior, middle and inferior in the vertical axis
 - B. The heart is safely found deep in the posterior mediastinum
 - C. The ascending aorta is found in the anterior mediastinum
 - D. The superior limit of the mediastinum is the thoracic inlet while the inferior limit is the thoracic diaphragm
 - E. The oesophagus and descending aorta are related to the thoracic vertebrae and lie outside the mediastinum
26. The following are relevant to the pericardium except
- A. Fibrous pericardium
 - B. Serous pericardium
 - C. Parietal pericardium
 - D. Mesothelium
 - E. Visceral pleura
27. Which of the following regarding portal vascular systems is true
- A. In a portal system, a capillary bed is situated between two portal veins
 - B. The hepatic portal system carries blood from the liver to the inferior vena cava
 - C. The hypothalamo-hypophyseal portal system is important for endocrine function
 - D. The hepatic portal vein drains into the inferior vena cava and has a portal valve
 - E. The hepatic portal circulation and systemic circulation have no sites of anastomosis
28. The following are secondary lymphoid organs except
- A. Peyer's patches
 - B. Waldeyer's ring
 - C. Appendix
 - D. Spleen
 - E. Bone marrow
29. The following is false regarding organs of the lymphoreticular system
- A. Secondary lymphoid organs are characterized by the presence of lymphoid follicles
 - B. The white pulp of the spleen is a site of B cell proliferation
 - C. The red pulp of the spleen is the site of B cell proliferation
 - D. Bone marrow is immune-privileged courtesy of reticular cell and sinusoidal endothelial cell activity
 - E. The subcapsular sinus in the lymph node receives afferent flow from the periphery

30. The following are regional lymph node groups except

- A. Inguinal nodes
- B. Axillary nodes
- C. Paraaortic nodes
- D. Cervical nodes
- E. Plantar nodes

Anterior abdominal wall and hollow gut 5 MCQS

31. The following is false of the anterior abdominal wall

- A. Parts of the small intestine are normally located in all regions except the hypochondriac regions
- B. The parietal peritoneum is the deepest layer of the anterior abdominal wall
- C. The inguinal canal is a remnant of the path by which testes descend from the abdomen to the scrotum
- D. Urine extravasated within the penile urethra will collect in a continuous subfascial space extending from the mid thigh to the nipple line
- E. The scrotum is a unique structure and is not continuous with the anterior abdominal wall

32. Which is false concerning the development of the alimentary canal

- A. Endoderm contributes to the mucosa of the small intestine
- B. Gastroschisis and omphalocele both result in the evisceration of intestinal loops outside with no peritoneal coverage
- C. Ectodermal derivatives are present in the alimentary canal
- D. Malrotation of the developing gut can result in an appendix placed in the left iliac fossa
- E. The neural crest is involved in the development of innervation to the gut wall

33. The following are layers of the gut wall on microscopy except

- A. Muscularis mucosa
- B. Lamina propria
- C. Submucosa
- D. Serosa
- E. Tunica media

34. Neural control of gut function is achieved through the following structures except

- A. Myenteric plexus
- B. Parasympathetic inputs from the vagus nerve and pelvic splanchnic nerves
- C. Sympathetic inputs from spinal thoracolumbar outflows
- D. Voluntary inputs from thoracic and lumbar spinal nerves
- E. A complex interplay of enteric, sympathetic and parasympathetic impulses

35. The following is false regarding the enterocyte

- A. It is not involved in digestion of proteins in the small intestine
- B. Brush border carbohydrases facilitate the breakdown of carbohydrates to simple sugars
- C. The enterocyte is adapted for transcellular and intercellular transport of nutrients
- D. Microvilli on the apical surface increase the surface area for brush border enzyme activity and

- E. A glycoprotein coat on the apex of microvilli protects enterocytes from enzymatic breakdown

Accessory organs of the GIT and organization of the abdominal cavity 5 MCQS

36. The following regarding the organization of the peritoneum is true
- A. It encloses the kidneys within it
 - B. It completely covers the uterus, bladder and rectum
 - C. The lesser omentum is located inferior to the greater omentum
 - D. It contains the stomach and liver in its supracolic compartment
 - E. The greater omentum is not important for control of inflammation
37. The following is true of the tongue except
- A. Extrinsic muscles of the tongue arise from the styloid process, palate, hyoid bone and the mandible
 - B. In its posterior extremity it contains a mass of lymphoid tissue
 - C. The transverse intrinsic muscles are involved in tongue-rolling
 - D. Circumvalate papillae do not contain taste buds
 - E. The tongue is anchored to the floor of the mouth by a fold of mucosa called the frenulum
38. Hepatocytes are involved in all of the following functions except
- A. Storage of vitamin A and E
 - B. Iron metabolism
 - C. Glycogenogenesis
 - D. Drug and toxin detoxification
 - E. Inactivation of insulin
39. The following statements about the exocrine pancreas are false
- A. Pancreatic acinar cells have large nuclei with prominent nucleoli
 - B. Pancreatic enzymes are released into the gut in the inactive state
 - C. The pancreas has a head, neck, body, tail and uncinuate process
 - D. Before entering the duodenum, the bile and pancreatic ducts unite into a single duct
 - E. The enzymes released by the endocrine pancreas include proteases, nucleases, lipases and enteropeptidase
40. The statements below are all true except
- A. Blood supply to the spleen and pancreas is derived from the Coeliac trunk
 - B. The rectum receives blood supply from the inferior mesenteric artery
 - C. The aorta is the source of the arteries to the foregut, midgut and hindgut
 - D. The oesophagus, umbilicus and rectum are sites of portosystemic anastomosis
 - E. The hepatic portal vein is a branch of the hepatic vein
41. The following is not true of the posterior abdominal wall
- A. Floating ribs have an important role
 - B. The diaphragm is found in its superior extent
 - C. It is found posterior to the aorta, lumbar and sacral nerves and the peritoneum
 - D. It is not related to the kidney
 - E. It includes muscles such as psoas minor, quadratus lumborum and iliacus

42. The following structures of the lymphatic system are found in the posterior abdominal wall region except
- A. Cisterna chyli
 - B. Common iliac nodes
 - C. Inferior mesenteric nodes
 - D. Coeliac nodes
 - E. Right lymphatic trunk
43. The following is true regarding the kidneys
- A. They are not related to the floating ribs
 - B. They are superior to the adrenal glands
 - C. They do not receive blood supply from the aorta
 - D. The right kidney is located at a more superior level than the left kidney
 - E. The right renal artery is longer than the left renal artery
44. The following are found in the glomerulus except
- A. Endothelial cells
 - B. Podocytes
 - C. Mesangial cells
 - D. Foot processes
 - E. An unspecialized basement membrane
45. The following is true of the path urine follows after it is produced except
- A. The renal calyces merge to form the renal pelvis
 - B. The ureter extends from the pelviureteric junction to the bladder trigone
 - C. The prostate gland is separated from the urinary bladder by the broad ligament in men
 - D. The membranous urethra is the shortest portion of the urethra in men
 - E. The flow of urine from the bladder is regulated by two sphincters
- Pelvis and reproductive systems 5 MCQS
46. Regarding the pelvis, the following is false
- A. The boundaries of the pelvic inlet include the iliac crest
 - B. A plane in contact with the anterior superior iliac spine and the pubic tubercle is used to describe the pelvis in anatomical position
 - C. It is formed from 3 bones fused at the acetabulum
 - D. For successful per vaginal birth, the head of the human fetus must fit through the pelvic inlet
 - E. The tip of the coccyx projects into the pelvic outlet
47. The following is false of the perineum
- A. It contains the roots of the external genitalia
 - B. It has a urogenital and anogenital triangle
 - C. It contains the terminal parts of the gastrointestinal and urinary tracts
 - D. Boundaries include the pubic arch and the sacrotuberous ligament
 - E. The urethra is not found in the perineum
48. The following structures are found exclusively in the male pelvis except
- A. Vas deferens
 - B. Seminal vesicles
 - C. Prostate gland
 - D. Bladder trigone
 - E. Fimbriae

49. The ovary

- A. Produces half of all estrogen in the body. The other half is produced in the zona reticularis of the adrenal gland
- B. Is held in place by the broad ligament only
- C. Releases one follicle every two weeks
- D. Undergoes a regular cycle of follicular maturation from the time of menarche till menopause
- E. Together with the uterus are target organs of luteinizing hormone

50. The following is false

- A. The corpus luteum produces progesterone
- B. Ovulation is triggered by a surge in luteinising hormone 14 days before the start of menstruation
- C. Oestrogen is the ovarian hormone underpinning the proliferative phase of the uterine cycle
- D. Under the influence of progesterone the uterine wall achieves its maximal thickness with deep uterine glands and abundant secretions
- E. Menses occurs at the time of death of the ovum because fertilization failed to occur

SECTION B: SHORT ANSWER QUESTIONS

1. Describe the role of the diaphragm, ribcage and sternum in the respiratory cycle, distinguishing their movements in inspiration and expiration (10marks)

2. List three structural and two functional features of cardiac muscle that distinguish it from other muscle types (5 marks)

3. State the functions of the following cells of the lymphoreticular system (5 marks)

- A. B lymphocytes
- B. CD8 lymphocytes
- C. CD4 lymphocytes
- D. Megakaryocytes
- E. Reticular cells

4. Using a well labelled diagram, illustrate the regions of the anterior abdominal wall, indicating an organ in each region (10marks)

5. List 5 roles the kidney serves in the body (5 marks)

6. Draw a well labelled diagram of the uterus indicating the cornu, cervix, fundus, body, internal os and external os (5 marks)