



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF ANATOMY
SCHOOL OF MEDICINE
THORAX RELATED EMBRYOLOGY AND HISTOLOGY
END TERM EXAMINATIONS

CODE: MBS 200

NAME: HUMAN ANATOMY 2

Date 21st April 2022

Time: 0900HRS-1200HRS

INSTRUCTIONS:

1. Write your University Registration Number on every Answer Booklet you use.
2. Do not write your name on any paper you use
3. The time allowed for this paper is THREE (3) hours.
4. The Questions are set out in FIVE (5) Sections, A, B, C, D and E.
5. Answer all questions (130 Marks total)
6. Read very carefully the additional instructions preceding each section.

SECTION A. MULTIPLE CHOICE SEGMENT. 40 MARKS.

- 1. Concerning the surface markings of the lung and pleura**
 - a. The border of the lung lies two ribs below the pleural reflection
 - b. The hilum of the lungs lies at the level of T10 vertebrae
 - c. The oblique fissure follows the line of T10 vertebra
 - d. The oblique fissure follows the line of the 5th rib
 - e. The horizontal fissure meets the oblique fissure in the left midaxillary line
- 2. About the superior mediastinum**
 - a. The apex of the left lung abuts the trachea
 - b. The left vagus is in contact with the trachea
 - c. The right phrenic descends in contact with SVC
 - d. The azygos vein hooks under the right main bronchus
 - e. SVC runs posterior to the right main bronchus
- 3. The thoracic duct**
 - a. Commences level with the body of T10
 - b. Enters the point of confluence of the left internal jugular and axillary vein
 - c. Receives the left jugular and subclavian lymph trunks
 - d. Receives lymph from the right thoracic wall
 - e. Passes in front of the oesophagus
- 4. Which is a true statement about the thoracic sympathetic trunk**
 - a. Passes into the abdomen behind lateral arcuate ligament
 - b. Greater splanchnic nerve comes from 3rd to 7th cervical ganglia
 - c. 1st thoracic ganglion often fuses with the inferior cervical ganglion
 - d. crosses 1st rib lateral to the superior intercostals artery
 - e. gives fibers to the esophageal plexus
- 5. Which is a true statement concerning the first rib?**
 - a. Scalenus Medius attaches to the scalene tubercle
 - b. Subclavian vein lies in the subclavian groove
 - c. Supreme intercostals vein lies medial to the superior intercostals artery
 - d. Scalenus posterior attaches lateral to the tubercle
 - e. Head articulates with vertebrae C7 and T1
- 6. Which is true phrase about the sternum?**
 - a. Jugular notch lies at the level of T4
 - b. 2nd costal cartilage articulates separately with the manubrium and the body of the sternum
 - c. sternohyoid attaches to the manubrium, below the 1st costal cartilage
 - d. interclavicular ligament makes no attachment to the sternum
 - e. posterior surface of the manubrium is completely covered with pleura
- 7. About the contents of the posterior mediastinum, all are true except:**
 - a. The oesophagus extends from the level of cricoid cartilage to traverse the diaphragm at T10
 - b. The descending thoracic aorta gives off the posterior intercostals arteries
 - c. It contains the perihilar lymph nodes

- d. The oesophagus is 25cm in length
 - e. The descending aorta commences at the lower level of T4 vertebra
- 8. In the anatomical position, the heart:**
- a. Has a right border comprised of right atrium and right ventricle
 - b. Has an anterior (sternocostal) surface comprised of right atrium, right ventricle and a strip of left ventricle
 - c. Has a posterior surface comprised of left atrium, 4 pulmonary veins and left ventricle
 - d. Has an inferior (diaphragmatic) surface comprised of left atrium, inferior vena cava and right ventricle
 - e. All of the above are true
- 9. Which of the following is not true of the surface markings of the left pleura?**
- a. It lies behind the sternoclavicular joint
 - b. It lies in the midline behind the angle of Louis
 - c. It lies at the level of the 6th rib in the midclavicular line
 - d. It crosses the midaxillary line at the level of the 10th rib
 - e. It crosses the 12th rib at the lateral border of the Sacro spinalis muscle
- 10. Left dominance means**
- a. Left side of the heart is more important
 - b. Posterior interventricular branch is given off from right coronary artery
 - c. Posterior interventricular branch is given off by a large anterior interventricular artery traveling off left coronary artery
 - d. It is more common than right dominance
 - e. It is given off directly from left coronary artery
- 11. The vagus nerve:**
- a. the right vagus nerve is in contact with the trachea
 - b. passes in front of the lung root
 - c. the right recurrent laryngeal branch hooks around the right subclavian artery
 - d. passes through the vena caval forearm
 - e. the right vagus nerve supplies branches to the superficial cardiac plexus
- 12. Which muscle is not used in inspiration?**
- a. erector spinae
 - b. quadratus lumborum
 - c. latissimus dorsi
 - d. transversus thoracis
 - e. pectoralis major
- 13. Concerning the pericardium:**
- a. the transverse sinus separates the four pulmonary veins
 - b. the parietal layer of the serous pericardium has no nerve supply
 - c. the fibrous pericardium is fused with the IVC
 - d. the fibrous pericardium is supplied by the phrenic nerve
 - e. strong stern pericardial ligaments connect the fibrous pericardium to the sternum
- 14. The azygous vein:**
- a. has an avascular fibrous cord in the abdomen

- b. begins as the union of ascending lumbar vein with the subcostal vein on the left side
- c. arches over the right pulmonary artery
- d. receives veins from the upper third of the oesophagus
- e. usually enters the brachiocephalic vein

15. Regarding blood supply to the heart:

- a. the SA nodal artery is more commonly a branch of the left coronary artery
- b. 40% of hearts show "left dominance"
- c. the marginal and anterior interventricular arteries are the main branches of the left coronary artery
- d. the right coronary artery arises from the posterior aortic sinus
- e. the circumflex artery travels in the atrioventricular groove

16. About attachments to the thoracic cage:

- a. pectoralis major has slips of origin from the upper 8 costal cartilages
- b. the first digitation of serratus anterior attaches to the 1st and 2nd ribs
- c. rectus abdominus is attached to the anterior surfaces of the 7th to 10th costal cartilages
- d. iliocostalis and longissimus, parts of erector spinae, are attached between the heads and tubercles of each rib
- e. serratus anterior is attached to the lower 8 ribs

17. As it concerns the root of the lung:

- a. the left pulmonary artery is longer than the right
- b. the bronchial branch to the upper lobe is separate on the left
- c. the pulmonary veins lie anterior and inferior to bronchus
- d. the pulmonary ligament connects the right and left lungs directly
- e. the pulmonary trunk divides in front of the right main bronchus

18. The deep cardiac plexus:

- a. is functionally separate from the superficial cardiac plexus
- b. lies to the right of ligamentum arteriosum
- c. receives predominantly right phrenic input
- d. is posterior to the bifurcation of the trachea
- e. is smaller than the superficial cardiac plexus

19. In the deepest intercostal muscle layer:

- a. the subcostals line the rib cage at the side
- b. fibers of the innermost intercostal group only span one intercostal space
- c. fibers of the subcostals group only span one intercostal space
- d. transversus thoracis fibers only arise from 2nd to 6th costal cartilages
- e. the border of the subcostal muscle group meets the innermost intercostal groups, overlapping slightly so the intercostal artery can slip between them to join the intercostal nerve

20. As it concerns the cardiac plexuses:

- a. the superficial plexus lies to the right of the ligamentum arteriosum, in front of the tracheal bifurcation, behind the aortic arch
- b. the deep plexus is smaller and lies in front of the ligamentum arteriosum
- c. the plexuses consist only of sympathetic and parasympathetic fibers

- d. pain fibers run with sympathetic nerves → sympathetic ganglia (3 cervical and upper 4-5 thoracic ganglia of both sides)
 - e. sympathetic fibers accelerate the heart and constrict the coronary arteries
- 21. The IVC passes through the diaphragm at the level of T8, which is TRUE?**
- a. this occurs to the left of the midline behind the 7th costal cartilage
 - b. the left phrenic nerve accompanies it
 - c. this occurs behind the 8th right costal cartilage
 - d. the right phrenic nerve accompanies it
 - e. it passes between the muscular levels of the diaphragm
- 22. With respect to the sensory innervation of the visceral pericardium, which of the following nerves predominantly provides sensory fibers?**
- a. left vagus
 - b. left phrenic
 - c. left 4th intercostal
 - d. all of the above
 - e. none of the above
- 23. A surface landmark which constitutes a guide to the gastro-esophageal orifice is the:**
- a. 7th left costal cartilage
 - b. left lineal semilunaris
 - c. tip of the 9th left costal cartilage
 - d. left nipple
 - e. level of the 11th thoracic vertebra
- 24. Which of the following is NOT true with respect to the ligamentum arteriosum?**
- a. it arises from the commencement of the left pulmonary artery
 - b. it joins the aorta at the level of the commencement of the brachiocephalic artery
 - c. the superficial part of the cardiac plexus lies anterior to it
 - d. the left recurrent laryngeal nerve hooks around it
 - e. the deep cardiac plexus lies to its right
- 25. About the phrenic nerves, all of the following are true, EXCEPT:**
- a. each nerve provides motor supply to own half of diaphragm, left phrenic also supply half of right crus
 - b. the phrenic nerve is supplied by its own pericardiophrenic artery which accompanies it
 - c. the right phrenic nerve is in contact with venous structures throughout its course
 - d. the left phrenic nerve passes to the inferior surface of diaphragm through muscle
 - e. arising mainly from C4 in the neck, the nerve passes behind the anterior scalene
- 26. Mitochondria in association with basal infoldings of the plasmalemma are characteristically found in**
- a. excretory duct cells
 - b. serous cells
 - c. intercalated duct cells
 - d. mucous cells
 - e. striated (secretory) duct cells
- 27. Serous secretory cells characteristically**

- a. has a nucleus flattened basally
 - b. has distinct lateral cell boundaries
 - c. has relatively vacant apical cytoplasm
 - d. may form demilunes
 - e. lacks intercellular canaliculi
- 28. Mucous secreting cells are least appropriately described as having**
- a. lighter stained cytoplasm than serous cells
 - b. flattened nuclei
 - c. relatively vacant appearing cytoplasm
 - d. distinct cell boundaries
 - e. the ability to form demilunes
- 29. Which one of the following correctly describes the structure of the major salivary glands?**
- a. compound tubular gland
 - b. simple tubulo-alveolar gland
 - c. compound alveolar gland
 - d. compound tubulo-alveolar gland
 - e. simple tubular gland
- 30. Tritiated thymidine is a radioisotope that is incorporated into DNA during the s-stage. Consequently, tritiated thymidine may be used to identify dividing cells. Which cells of the dental organ would you expect would incorporate tritiated thymidine?**
- a. organizing
 - b. maturation
 - c. morphogenic
 - d. protection
 - e. secretory
- 31. High blood calcium levels cause calcitonin release from which of the following cells?**
- a. chief cells of the parathyroid
 - b. interstitial cells (of Leydig)
 - c. cells of the zona reticularis of the suprarenal gland
 - d. pinacocytes
 - e. parafollicular cells of the thyroid gland
- 32. Melanin is released by which of the following cells?**
- a. chief cells of the parathyroid
 - b. interstitial cells (of Leydig)
 - c. cells of the zona reticularis of the suprarenal gland
 - d. pinealocytes
 - e. parafollicular cells of the thyroid gland
- 33. Calcitonin is secreted by these specific cells**
- a. chromophils
 - b. interstitial cells (of Leydig)
 - c. basophils
 - d. principal cells of the thyroid
 - e. parafollicular cells of the thyroid

- 34. This cell is responsible for the majority of bone resorption/remodeling**
- bone lining cell
 - osteoblast
 - osteoclast
 - monocyte
 - fibroblast
- 35. Which one of the following vessels exhibits the greatest permeability?**
- continuous type of capillaries
 - lymph capillaries
 - fenestrated capillaries
 - postcapillary venules
 - fenestrated sinusoids
- 36. Liquor amnii is:**
- In the yolk sac
 - Is swallowed by fetus
 - Is produced by placenta
 - (a) & (b)
 - (a), (b) & (c).
- 37. Surfactant is present in the lungs starting from**
- 7th month of pregnancy.
 - 8th month of pregnancy.
 - 9th month of pregnancy.
 - 10th month of pregnancy.
 - 11th month of pregnancy.
- 38. All of the following are features of heart development except:**
- The heart is the first organ to begin its physiologic function.
 - The angiogenetic cell clusters giving rise to the heart originate cranial to the oropharyngeal membrane.
 - The ventral mesocardium - breaks down after heart looping.
 - The myoepicardial mantle forms cardiac myocytes.
 - The cardiac endothelium is derived from mesenchyme.
- 39. A persistence of the proximal end of the yolk stalk in an adult is called the:**
- Urachal ligament.
 - Ductus venosum.
 - Vitelline membrane.
 - Appendix.
 - None of the above.
- 40. Allantoenteric diverticulum:**
- Forms at the anterior wall of the yolk sac.
 - Is quite elaborate in man.
 - May be involved in abnormalities of bladder development.
 - Is synonymous with neurenteric canal.
 - First appears in the fourth week IUL

SECTION B: SHORT STRUCTURED SECTION. EACH QUESTION IS 10 MARKS.

1. Describe the histological arrangement of elastic arteries
2. Describe the formation of the atrial septum
3. Discuss the origin, course and distribution of posterior intercostal arteries
4. Briefly discuss posterior origin/attachments of the diaphragm and its related structures

SECTION C: FILL IN BLANK SPACES. 20 MARKS.

1. _____ occurs when the muscular septum and membranous septum of the endocardial cushion fuse.
2. The _____ receives blood from the bulbus cordis and passes it to aortic arch system for distribution to the lungs.
3. The thoracic lymphatic duct begins in the abdomen at the _____ and ascends through the posterior mediastinum at the posterior surface of the esophagus.
4. The _____ are paired arteries that supply blood to lower nine intercostal spaces.
5. The region posterior to the heart and anterior to the bodies of T5-T12 vertebrae is _____
6. The _____ system is a ramification of the bundle branches in the ventricles of the heart.
7. _____ is caused by abnormalities of valve leaflets, rupture of papillary muscle and left ventricular enlargement.
8. The _____ infarct of the heart is caused by occlusion of the left circumflex coronary artery.
9. _____ occurs when there is budding of new blood vessels from small sprouts of existing vessels that cause expansion of capillary network.
10. _____ is described as pressure, discomfort or feeling of breathlessness in the left substernal region that radiates to the shoulder.
11. _____ is a small appendage representing primitive embryonic atrium whose wall has pectinate muscle.
12. _____ is a very thin superior portion of interventricular septum and site for most ventricular septal disease.
13. _____ results from accumulation or bleeding into pericardial sac.
14. The space posterior to the aorta and pulmonary trunk in which you can clamp vessels with fingers and observe is _____
15. _____ is the sharp right ventricular margin of the heart, largely the right atrium.
16. The parasympathetic _____ fibers contract bronchial smooth muscles and vasodilate pulmonary vessels.
17. _____ is a dome of cervical parietal pleura extending above the first rib.
18. Reflection points where the lung does not fully extend into pleural space is _____
19. The _____ ligaments connect two sternoclavicular joints.
20. The superior _____ conveys large vessels, important nerves and lymphatic ducts.

SECTION D. LABEL THE PLATES A & B and C BELOW. 30 MARKS.

PLATE A. LABEL THE AREAS MARKED 1 TO 10 (10 Marks)

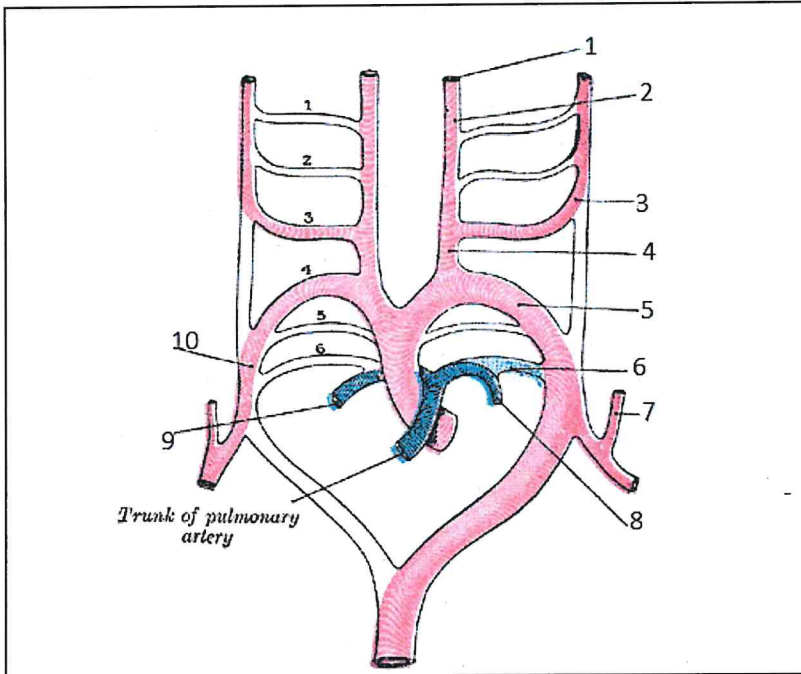


PLATE B. LABEL THE AREAS MARKED 1 TO 10 (10 Marks)

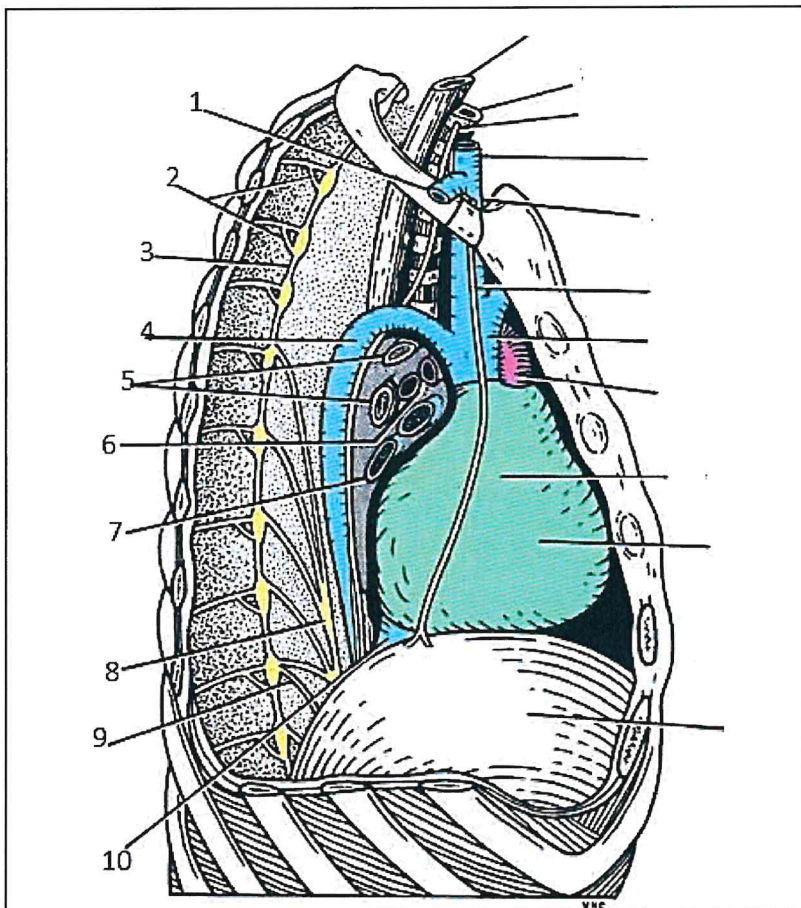


PLATE C. LABEL THE AREAS MARKED 1 TO 10 (10 Marks)

