

## ACADEMIC BOARD - CLASS OF 2021

### Histology Cardiovascular and Respiratory System ( Past Questions)

1. WHICH of the structures in the respiratory tract is important in moistening of the inspired air
  - A. Lymph
  - B. Capillaries Plexus in the lamina propria
  - C. Seromucous glands**
  - D. Ciliated glands
2. In bronchial athma, there is hyper-responsiveness of the airway smooth muscles to environmental agents resulting in airway obstruction. Which portion of the respiratory tree is most affected in this disease?
  - A. Trachea
  - B. Primary Bronchus
  - C. Alveoli
  - D. Bronchioles**
3. The layer of the heart wall synonymous with visceral layer of the serous pericardium is:
  - A. Myocardium
  - B. Endocardium
  - C. Epicardium**
  - D. Parietal Layer of the serous pericardium
4. Which layer of the wall of the heart is in direct contact with blood in its chambers?
  - A. Epicardium
  - B. Endocardium**
  - C. Myocardium
  - D. Pericardium
5. The impulse that gives to the atrial and ventricular contraction in the heart is initiated by which of the following:
  - A. Purkinje Fibres

B. Myoendocrine cells

C. Atrioventricular nodes

**D. Sino-atrial node**

6. The respiratory conducting passageways perform all of the following functions except:

A. Purify air

B. Humidify air

**C. Exchange gases**

D. Warm incoming air

7. What is the role of mucous in the nasal cavity?

A. Increase the air turbulence in the nasal cavity

B. Warming the inspired air

C. Sweep trapped particulate matter towards the pharynx

**D. Trap incoming bacteria and other foreign debris**

8. Which of the following statements is not true about TYPE 1 Alveolar cells?

A. They form occluding junctions with one another

**B. They cover 40% of the alveolar surface**

C. The cellular organelles are grouped around the nucleus

D. They constitute above 40% of alveolar surface cells population

9. Which of the listed vessels has a prominent internal elastic lamina?

A. Collecting venule

B. Large capillary

**C. Small artery**

D. Metarteriole

10. An aneurysm is a permanently dilated thin walled artery which is prone to rupture resulting in often fatal haemorrhage. The abdominal aorta is the most common vessel with this type of aneurysm. Which layer in the wall of the aorta will be most affected in this case?

- A. Tunica intima
- B. Tunica media**
- C. Tunica adventitia
- D. A and B

11. Why is the internal elastic lamina in large arteries not as prominent as it is in muscular arteries in slides stained with Haematoxylin and eosin?

- A. It is very thin
- B. Of the abundance of many elastic fibres in the tunica media**
- C. It is masked by the presence of a lot of reticular tissue
- D. It does not stain very well with H&E

12. In the disease condition known as aneurysm the wall of the artery is:

- A. Constricted
- B. Hardened
- C. Greatly dilated**
- D. Lined by fatty deposits

13. Which of the following vessels has the thickest tunica adventitia

- A. Elastic artery
- B. Muscular artery
- C. Muscular vein**
- D. Venule

14. Which of the following lacks smooth muscle in its wall?

- A. Terminal bronchiole
- B. Respiratory bronchiole
- C. Alveolar duct
- D. Alveolar sac**

15. Why do pneumocyte Type II cells occupy a small area of the alveolar surface even though they outnumber the pneumocyte type I cells?

- A. Because of their small size
- B. Because of their cuboidal shape**

- C. Because they lack microvilli
- D. All of the above

16. Olfactory epithelium differs from respiratory epithelium in which of the following ways?

- A. It lacks goblet cells**
- B. It has a very short microvilli
- C. Basal cells divide to replace required columnar cells
- D. All of the above

17. Why is it that the cilia on olfactory receptor cells are non-motile?

Because they

- A. Function as small receptors
- B. Lack dynein arms**
- C. Are covered by very thick mucus
- D. Lack the full complement of microtubules

18. Why does the true vocal fold have a covering of stratified squamous non-keratinizing instead of pseudostratified columnar ciliated epithelium?

Because:

- A. It must withstand friction caused by vibration against air passing through larynx**
- B. It must prevent food from entering the larynx
- C. It forms a barrier against infection
- D. B and C but no A

19. Respiratory Distress Syndrome is a life-threatening disease that affects the newborn . Lung alveoli are unable to function properly because surfactant is deficient. Which cell/cells in the lung is/are responsible for its production.

- A. Clara cells
- B. Pneumocyte Type II**
- C. Both Clara and Pneumocyte Type II
- D. Capillary endothelium

20. The main purpose of the blood-air barrier in the lungs is to :

- A. Prevent blood elements from coming into contact with alveolar cells
- B. Prevent macrophages from coming into contact with lymphocytes in blood
- C. Prevent lymphocytes from gaining access to interalveolar septum
- D. Allow fast diffusion**

21. What is the difference between primary bronchi and secondary bronchi histologically

- A. Absence of glands in the submucous
- B. The reduction of epithelium in simple columnar
- C. A complete ring of cartilage**
- D. Absence of adventitia

22. Unlike the bronchi whose airway are kept open by cartilage , the alveolar wall is supported by which of the following?

- A. Smooth muscle
- B. Thick basement membrane
- C. Elastic fibres**
- D. Bundles of collagenous fibres
- E. A row of dust cells

23. Which of the following does not form part of blood air barrier?

- A. Pneumocyte Type 1
- B. Pneumocyte Type 2**

- C. Fused membranes of endothelium and pneumocyte
- D. Capillary endothelium
- E. B, C and D

24. Which of the following is the most prominent component in the wall of a bronchiole?

- A. Collagen Type I fibres
- B. Smooth muscle**
- C. Hyaline Cartilage
- D. Elastic Cartilage

25. Which of the following secreted by capillary endothelial cells acts as vasoconstrictor?

- A. Endothelin I**
- B. Prostacyclin
- C. Norepinephrine
- D. Nitric Oxide

26. Which of the listed vessels has a prominent elastic lamina?

- A. Muscular artery**
- B. Muscular vein
- C. Arteriole
- D. Metarteriole

27. The trachea and secondary bronchus have this **ONE** characteristic in common.

- A. Presence of smooth muscle bridging end of cartilage
- B. Pseudostratified columnar epithelium with Goblet cells**
- C. Presence of rings of hyaline cartilage
- D. Presence of circularly arranged smooth muscle

27. The disease condition called aneurysm is characterized by ballooning of the aorta. It is caused by:

- A. Mutation in the fibrillin gene resulting in lack of resistance in the wall**
- B. Mutation in the collagen gene resulting in cracks in wall
- C. Neither A or B
- D. Lack of an internal elastic lamina

28. In Kartagener's Syndrome, the columnar cells have:

- A. Very long cilia
- B. Very short cilia
- C. Cilia in which dynein is either absent or defective**
- D. Cilia which do not beat because they lack mitochondria

29. The components of blood-barrier include the following EXCEPT:

- A. Alveolar epithelium
- B. Fused basement membranes of endothelial membranes of endothelial and alveolar cells
- C. Interstitium**
- D. Capillary endothelium

30. Type II pneumocytes:

- A. Occupy only 5-10% of the alveolar surface**
- B. Are not capable of cell division
- C. Contain very few organelles Have no microvilli
- D. Contain very few organelles

31. Which of the following are blood vessels are the capacitor vessels that hold approximately 70% of total blood volume?

- A. Arteries

B. Metarterioles

**C. Veins**

D. Capillaries

32. Which is the thickest layer in the wall of a large vein?

A. Tunica intima

B. Tunica media

**C. Tunica adventitia**

D. None of the above

33. A lymphatic capillary has all EXCEPT ONE of the following structural features.

**A. Fenestrated endothelial cells**

B. Poorly developed or no basal lamina

C. No pericytes are associated with them

D. Lack tight junctions between endothelial cells

34. The trachea and the secondary bronchus have this one characteristic in common.

A. C- shaped cartilage

B. B. Circularly arranged smooth muscle

**C. Pseudostratified columnar ciliated epithelium with goblets**

D. Smooth muscle bridging end of C-shaped cartilage

E. Rings of hyaline cartilage

35. How can one tell a respiratory bronchiole from a terminal one under the light microscope?

A. A discontinuous wall where epithelium lacks a basement membrane

**B. A discontinuous wall where alveolar occupy gas**

C. Absence of smooth muscle in wall

D. Absence of goblet cells

E. Non ciliated simple epithelium

36. Which is the reason why swell bodies appear in nasal cavity? To:

A. Filter inspired air

- B. Increase surface area for conditioning of air
- C. Prevent desiccation of respiratory epithelium**
- D. Prevent toxic gases from entering lung
- E. Warm inspired air

37. Air passageways or conducting portion of the respiratory system maintains a constant supply of air to the site of gaseous exchange. What structures enable them to do that?

- A. Cartilage to keep the tubes patent
- B. Elastic fibres to allow recoil
- C. Smooth muscle to vary diameter
- D. A, B and C**

38. Histologically, which is the innermost layer in the wall of the heart?

- A. Parietal layer of serous pericardium
- B. Visceral layer of serous pericardium
- C. Tunica adventitia
- D. Tunica intima**
- E. Tunica media

39. The heartbeat is initiated by a group of specialized cells that form the sino atrial node which is located in the atrium. Under the light microscope, these specialized cells can be distinguished from their working counterparts by which of the following?

- A. Absence of myofilaments
- B. Very few myofilaments
- C. Small size
- D. A and C
- E. Band C**

39. Which of the following blood vessels has a prominent internal elastic lamina?

- A. Abdominal Aorta
  - B. Common iliac
  - C. Pulmonary trunk
  - D. Renal artery**
  - E. Renal vein
40. Which of the following blood vessels has the thickest tunica adventitia?
- A. Aorta
  - B. Mesenteric artery
  - C. Mesenteric vein**
41. What causes the development of varicose veins?
- A. Degenerative walls
  - B. Incompetent valves
  - C. Weak walls
  - D. A,B and C**
  - E. A and B only
42. One characteristic which distinguish lymphatic capillaries from their blood counterpart is that:
- A. Their walls are fenestrated
  - B. The endothelium rests on a basement membrane**
  - C. There are no supporting pericytes
  - D. The endothelium may be thickened
  - E. The basement membrane may be discontinuous
43. In which of the following organs or structures would presence of fenestrated capillaries be beneficial?
- A. Cartilage
  - B. Lamina propria**
  - C. Lung
  - D. Skeletal muscle

E. Spinal cord

44. High Endothelial Vessels (HEV) occur in certain lymphoid organs such as lymph nodes. They serve as

- A. Exit points for lymphocyte in blood**
- B. Exit points for antibody in lymph node
- C. Place where macrophages interact with blood elements
- D. Point of exit for neutrophils

45. Atriovenous anastomoses which are common in the dermis of the skin are useful in thermoregulation. Why is this so? Because:

- A. By relaxation of their smooth muscle blood flow through the capillaries is shunted to deep layers of the skin.
- B. By contraction of their smooth muscles capillaries receive blood
- C. By contraction and relaxation of component smooth muscles, blood flow to surface of skin is regulated.**
- D. Of their relatively wider diameter, they can serve as a blood reservoir
- E. All of the above

46. Heart valve normally consists of endothelial surface covering

- A. Cardiac muscle fibres
- B. Hyaline cartilage
- C. Loose areolar Connective tissue
- D. Fibrocollagenous and fibroelastic connective tissue**
- E. Adipose connective tissue

47. Which of the following features is a normal component of epicardium but not of endocardium?

- A. Adipocytes**
- B. Collagen
- C. Elastin

D. Fibroblast

E. Simple squamous epithelial tissue

49. Which cell junction located at intercalated discs is responsible for electrical communication between cardiac muscle cells?

A. Macula adherens

B. Zonula adherens

C. Zonula occludens

D. Desmosome

**E. Gap junction**

50. Which of the following is not true regarding the endocardium?

**A. The endocardium contains adipose tissue**

B. The endocardium has sub-layers

C. The endocardium contains blood vessels

D. The endocardium contains smooth muscles

E. The endocardium is lined by endothelium

51. The thickest layer of the heart is the .....

**A. Myocardium**

B. ENdocadium

C. Epicardium

D. Visceral layer

52. Which cell is found in large numbers in the terminal bronchioles?

**a. Clara cell**

b. Type I pneumocyte

c. Type II pneumocyte

d. Dust cell

e. Brush cell

53. What type of epithelium is found in the respiratory mucosa of man?

a. Non-ciliated pseudostratified columnar epithelium with goblet cells

**b. Ciliated pseudostratified columnar epithelium with goblet cells**

c. Simple columnar epithelium

- d. Stratified squamous epithelium
  - e. Transitional epithelium
54. What type of tissue forms the Type I Pneumocytes in the lung?
- a. **Simple squamous epithelium**
  - b. Simple cuboidal epithelium
  - c. Simple columnar epithelium
  - d. Stratified squamous epithelium
  - e. Pseudostratified epithelium
55. Which cell is rarely found in the alveolus?
- a. Clara cell
  - b. Type I pneumocyte
  - c. Type II pneumocyte
  - d. Dust cell ( Alveolar phagocyte)
  - e. **Brush cell**
56. What is the first portion of the respiratory tree where gas exchange can occur?
- a. Alveolar duct
  - b. Alveoli
  - c. Alveolar sac
  - d. **Respiratory bronchiole**
  - e. Terminal bronchiole
57. Which cartilage of the larynx is made of elastic cartilage?
- a. Thyroid cartilage
  - b. Cricoid cartilage
  - c. Arytenoid cartilage
  - d. **Epiglottis**
  - e. Corniculate cartilage
58. Respiratory surfactant is:
- (a) **secreted by epithelial type 11 cells (septal cells)**
  - (b) a glycoprotein
  - (c) a phospholipids

- (d) important in increasing the surface tension of alveoli
- (e) essential for correct respiratory function

59. The dust cells in lung alveoli:

- (a) are phagocytic**
- (b) secrete surfactant
- (c) produce antibodies
- (d) participate directly in gaseous exchange
- (e) develop from monocytes

60. Which of the following could NOT be part of an acinus?

- A. alveolar sacs
- B. Alveolar ducts
- C. Terminal bronchioles**
- D. Respiratory bronchiole