1. Regarding lymphatic capillaries, all of the following are true except:
   A. Can be modified to absorb fats from the intestinal lumen.
   B. Are narrower in diameter than true vascular capillaries.  
   C. Are blind, in that they are not continuous in both directions. 
   D. Have overlapping endothelial cells that act as valves to maintain unidirectional flow.
   E. Have an incomplete basement membrane.

2. The gland located in the submucosa of the duodenum only is the:
   A. Tubular gland
   B. Crypt of Lieberkühn
   C. Enteroendocrine glands
   D. Brunner’s glands

3. Of the following cartilages, which is not a paired cartilage of the larynx?
   A. Arytenoid
   B. Corniculate
   C. Cricoid
   D. Cuneiform

4. Surfactant, produced by ____________________________, reduces surface tension and prevents the alveoli from collapsing during exhalation.
   A. Pulmonary capillary endothelium
   B. Type I pneumocytes
   C. Alveolar epithelium
   D. Alveolar macrophages
   E. Septal cells

5. The primary capillary plexus in the hypothalamic-hypophyseal portal system can be found at the:
   A. Adenohypophysis
   B. Median eminence
   C. Neurohypophysis
   D. Infundibulum
   E. Pituitary gland
6. An anastomosis:
   A. Allows for direct communication between an artery and a vein
   B. Occurs when multiple arteries supply the same capillary bed
   C. Are associated with areas of the body where postural or positional changes can obstruct blood flow
   D. Will help to keep blood flowing to important organs, including the brain and heart
   E. All of the above are correct

7. Systemic edema caused by liver failure would occur because the liver produces ______________, an important plasma protein for maintaining blood osmolarity.
   A. Angiotensinogen
   B. Fibrinogens
   C. Albumins
   D. α and β globulins
   E. γ globulins

8. Lymph nodes can be found clustered in which of the following regions?
   1. Patellar
   2. Inguinal
   3. Bronchomediastinal
   4. Cubital
   A. 1 and 3
   B. 2 and 4
   C. 1, 2, and 3
   D. All of the above
   E. None of the above

9. In the stomach, the oblique layer of smooth muscle is a modification to the:
   A. Adventitia
   B. Muscularis externa
   C. Submucosa
   D. Muscularis mucosa
   E. Mucosa

10. The sphincter associated with the hepatopancreatic ampulla is the:
    A. Sphincter of Oddi
    B. Sphincter of Boyden
    C. Sphincter of Auerbach
    D. Sphincter of Langerhans
    E. Sphincter of Meissner
11. A liver lobule has all of the following structures associated with it except:
   A. Hepatocytes
   B. Central vein
   C. Sinusoidal capillaries
   D. Portal triad
   E. All of the above are associated with a hepatic lobule

12. The great saphenous vein is a large, superficial vein that drains the lower extremity. You are likely to see what kind of structure in the great saphenous vein?
   A. Dense elastic tissue in the tunica media
   B. Valves in order to prevent backflow of the blood
   C. Sinuses in order to allow blood to collect
   D. Smooth muscle to help move the venous blood back towards the heart

13. Which of the following is not a difference between the left lung and the right lung?
   A. The left lung has only two lobes, the right lung has three.
   B. The left lung lacks a horizontal fissure, while there is a horizontal fissure present on the right lung.
   C. The left lung has the cardiac notch for the heart to fit into, the right lung does not.
   D. The left lung is served by two primary bronchi, while the right lung is served by one primary bronchus.
   E. You jerk, all of these are differences between the left and right lungs.

14. Which valve prevents blood from flowing back into a pulmonary vein?
   A. Tricuspid valve
   B. Mitral valve
   C. Pulmonary semilunar valve
   D. Bicuspid valve
   E. None of the above

15. The lamina propria in the digestive system is made up of:
   A. Dense irregular connective tissue
   B. Adipose tissue
   C. Areolar connective tissue
   D. Reticular connective tissue
   E. Dense elastic connective tissue
16. The sigmoid colon receives autonomic innervation from the:
   1. Pelvic splanchnic nerves
   2. Cranial nerve X
   3. Inferior mesenteric plexus
   4. Superior mesenteric plexus

   A. 1 and 3
   B. 2 and 4
   C. 1, 2, and 3
   D. All of the above
   E. None of the above

17. What kind of epithelium is present in the mucosa of the trachea?
   A. Simple ciliated columnar epithelium
   B. Pseudostratified ciliated cuboidal epithelium
   C. Pseudostratified ciliated columnar epithelium
   D. Simple ciliated cuboidal epithelium
   E. Pseudostratified nonciliated columnar epithelium

18. All of the following structures can be found in the ventricles of the heart except:
   A. Trabeculae carnae
   B. Pectinate muscles
   C. Papillary muscles
   D. Chordae tendinae
   E. All of the above can be found in the ventricles

19. The right thoracic duct only drains lymphatic trunks from ¼ of the body. The trunks drained by
    the right thoracic duct include:
    1. Right jugular trunk
    2. Right bronchomediastinal trunk
    3. Right subclavian trunk
    4. Right intestinal trunk

    A. 1 and 3
    B. 2 and 4
    C. 1, 2, and 3
    D. All of the above
    E. None of the above

20. Which of the following arteries is not a branch of the axillary artery?
   A. Subscapular artery
   B. Lateral thoracic artery
   C. Thoracoacromial artery
   D. Supraclavicular artery
   E. Anterior humeral circumflex artery
21. The hypoglossal nerve innervates all of the following extrinsic tongue muscles except:
   A. Genioglossus
   B. Hyoglossus
   C. Palatoglossus
   D. Styloglossus

22. The fibrous pericardium:
   A. Prevents overfilling of the heart.
   B. Is made of dense regular connective tissue.
   C. Anchors the heart to the cardiac notch of the right lung.
   D. Suspends the heart in a frictionless environment.
   E. More than one of the above is correct.

23. The ligamentum arteriosum is a remnant of the fetal structure called ________________, which shunted blood from the pulmonary trunk to the ________________.
   A. Ductus arteriosus, left pulmonary veins
   B. Ductus venosus, left pulmonary veins
   C. Ductus arteriosus, aorta
   D. Ductus venosus, aorta
   E. Ductus pulomonale, aorta

24. The most superior region of the stomach is the:
   A. Pylorus
   B. Fundus
   C. Cardia
   D. Body
   E. Lesser curvature

25. The auditory tubes (Eustachian tubes) drain the middle ear into the:
   A. Oropharynx
   B. Pharynx
   C. Laryngopharynx
   D. Nasopharynx

26. Bronchopulmonary segments are directly supplied by:
   A. Terminal bronchioles
   B. Respiratory bronchioles
   C. Secondary bronchi
   D. Tertiary bronchi
   E. Primary bronchi
27. One of the congenital heart defects we have studied this semester is the transposition of the great vessels. Transposition of the great vessels would result in which of the following pathologies?

1. Pulmonary trunk coming off of the left ventricle
2. Pulmonary trunk off of the right ventricle
3. Aorta off of the right ventricle
4. Aorta off of the left ventricle

A. 1 and 3  
B. 2 and 4  
C. 1, 2, and 3  
D. All of the above  
E. None of the above

28. The portion of the alimentary canal that most closely resembles the “typical” gut tube histology is the:

A. Jejunum  
B. Ascending colon  
C. Stomach  
D. Esophagus  
E. Descending colon

29. Insulin and glucagon are produced by the β cells and the α cells of the pancreas, respectively. The aggregations of α and β cells are called:

A. Crypts of Langerhans  
B. Islets of Langerhans  
C. Islets of Lieberkühn  
D. Crypts of Lieberkühn

30. Which of the following features are all unique to the cells of the myocardium?

1. Intercalated discs  
2. Sarcomeres  
3. Branched cells  
4. Multinucleated cells

A. 1 and 3  
B. 2 and 4  
C. 1, 2, and 3  
D. All of the above  
E. None of the above
31. Which of the following branches of the abdominal aorta is unpaired?
   A. Testicular artery
   B. Ovarian artery
   C. Renal artery
   D. Colic artery
   E. Suprarenal artery

32. During swallowing, the ___________________ moves superiorly to prevent ingested material from entering the nasopharynx, and the __________________ moves inferiorly to block the rima glottidis and the trachea.
   A. Epiglottis, uvula
   B. Uvula, vestibular folds
   C. False vocal folds, epiglottis
   D. Uvula, epiglottis
   E. False vocal folds, true vocal folds

33. Sympathetic nervous system innervation to the pancreas would cause:
   A. A decrease in pancreatic enzyme production
   B. A decrease in cholecystokinin (CCK) production
   C. A decrease in bicarbonate production
   D. A and C
   E. All of the above

34. Functions of the lymphatic system do not include:
   A. Returning excess interstitial fluid to circulation
   B. Absorption of fats and fat soluble vitamins from the digestive system
   C. Production, development, and maintenance of lymphocytes
   D. Pathogen defense
   E. All of the above are functions of the lymphatic system.

35. The structure responsible for initiating the cardiac cycle by depolarizing the atria is the:
   A. Purkinje fibers
   B. Bundle branches
   C. Bundle of His
   D. Atrioventricular node
   E. Sinoatrial node
36. The enzyme produced by the chief cells in the stomach is:
   A. Hydrochloric acid
   B. **Pepsinogen**
   C. Trypsinogen
   D. Pepsin
   E. Gastrin

37. Which of the following structures help form filtrate?
   1. Lamina densa
   2. Filtration slits
   3. Podocytes and pedicels
   4. Glomerular fenestrations
   A. 1 and 3
   B. 2 and 4
   C. 1, 2, and 3
   D. **All of the above**
   E. None of the above

38. When blood pressure in the right ventricle exceeds blood pressure in the right atrium, which valve closes?
   A. Bicuspid valve
   B. Mitral valve
   C. Right semilunar valve
   D. Pulmonary semilunar valve
   E. **Tricuspid valve**

39. All cartilages in the larynx are ______________________, except for the epiglottis.
   A. Elastic cartilage
   B. Fibrocartilage
   C. **Hyaline cartilage**
   D. Respiratory cartilage

40. The reservoir for lymph from the lower extremities and the intestinal tract is the:
   A. Cisterna lymphatica
   B. Intestinal trunk
   C. Cisterna entera
   D. Cholecysterna
   E. **Cisterna chyli**
41. Which veins form the hepatic portal vein, in the most common arrangement?
   1. Splenic vein
   2. Inferior mesenteric vein
   3. Superior mesenteric vein
   4. Celiac vein
   A. 1 and 3
   B. 2 and 4
   C. 1, 2, and 3
   D. All of the above
   E. None of the above

42. The myenteric plexus and the submucosal plexus are both components of which arm of the nervous system?
   A. Visceral motor system
   B. Autonomic nervous system
   C. Efferent nervous system
   D. Peripheral nervous system
   E. Enteric nervous system

43. The tonsil between the palatoglossal and palatopharyngeal arches in the oral cavity is the:
   A. Adenoid tonsil
   B. Palatine tonsil
   C. Pharyngeal tonsil
   D. Lingual tonsil
   E. Sublingual tonsil

44. You are an erythrocyte in the superficial plantar arch in the left sole. The foot you’re in carelessly steps on a thumbtack, and you rush up to the left quadriceps femoris muscle to be able to withdraw your foot from the thumbtack. What route do you take to get there?
   1. Left common iliac artery
   2. Inferior vena cava
   3. Left great saphenous vein
   4. Left femoral artery
   5. Left common iliac vein
   6. Left external iliac artery
   A. 5, 3, 2, 1, 6, 4
   B. 4, 6, 1, 2, 5, 3
   C. 3, 1, 2, 5, 6, 4
   D. 3, 5, 2, 1, 4, 6
   E. 3, 5, 2, 1, 6, 4

45. The structure that separates the ileum from the cecum is the:
   A. Distal intestinal sphincter
   B. Ileocecal valve
   C. Ileocecal sphincter
   D. Pyloric sphincter
   E. Enterocolic valve
46. Which of the following vessels has no tunica media?
   A. Veins
   B. Muscular arteries
   C. Arterioles
   D. Venules

47. Of the following organs, which ones are retroperitoneal?
   1. Kidneys
   2. Descending colon
   3. Pancreas
   4. Duodenum
   A. 1 and 3
   B. 2 and 4
   C. 1, 2, and 3
   D. All of the above
   E. None of the above

48. In dissecting aneurysms of the aorta, blood tears the tunica intima and causes shearing between the elastin and smooth muscle of the ______________.
   A. Tunica externa
   B. Tunica interna
   C. Tunica muscularis
   D. Tunica media
   E. Tunica adventitia

49. Lymphatic system components can be found everywhere in the body except:
   A. Liver
   B. Kidneys
   C. Bone marrow
   D. Lungs
   E. Synovial joints
Matching: Match the following fetal structures to their function.

50. The connection to the inferior vena cava.  
51. Shunts oxygenated blood from the right atrium to the left atrium.  
52. Branch of the internal iliac artery that carries deoxygenated blood back to the placenta.  
53. Carries oxygenated blood to the fetus.  
54. Shunts oxygenated blood from the pulmonary trunk to the aortic arch. 

A. Ductus arteriosus  
B. Foramen ovale  
C. Umbilical vein  
D. Ductus venosus  
E. Umbilical arteries

50. D  
51. B  
52. E  
53. C  
54. A