Human Anatomy & Physiology II
with Dr. Hubley

Practice Exam III

Name: ________________________________

Instructions
This exam consists of 50 questions. You may write on the exam itself, but be sure to answer all your questions on a “Scantron” sheet with a #2 pencil. For each question there is one response that is the best response. You must select the one best response to receive credit for each question.

Read all responses for a question before selecting your answer! I recommend that you first write your answers on the exam itself, then fill in the answers on the answer sheet. If you fill in a response on the answer sheet and wish to change your response, then be sure to completely erase the errant response.

Be sure to write your name on this exam booklet and on the answer sheet. Turn in both the exam booklet and answer sheet as you leave. If you believe that a question is written incorrectly, then attach a note to the front of this exam.
1. During __________ CO₂ and O₂ are exchanged between the blood and air in the alveoli.
   a. anaerobic respiration
   b. cellular respiration
   c. external respiration
   d. internal respiration
   e. pulmonary ventilation

2. Which one of the following processes is accomplished by contraction of the diaphragm?
   a. anaerobic respiration
   b. cellular respiration
   c. external respiration
   d. internal respiration
   e. pulmonary ventilation

3. Which one of the following functions is NOT a function of the respiratory system?
   a. protection of the respiratory surface from dehydration
   b. ventilation of the exchange surface
   c. production of sounds for communication
   d. reception of olfactory stimuli
   e. transport of oxygen from the lungs to the systemic tissues

4. Which one of the following structures is part of the conducting zone?
   a. alveolar duct
   b. alveolus
   c. respiratory bronchiole
   d. All of the structures listed above are part of the conducting zone.
   e. None of the structures listed above is part of the conducting zone.

5. Which one of the following structures is part of the pathway for both the respiratory and digestive systems?
   a. nasopharynx
   b. external nares
   c. glottis
   d. oropharynx
   e. esophagus
6. Of the following functions, which is most directly related to the larynx?
   a. provision of an extensive surface area for external respiration
   b. ventilation of the exchange surface
   c. production of sounds for communication
   d. reception of olfactory stimuli
   e. transport of oxygen from the lungs to the systemic tissues

7. Throughout most of the respiratory system, including the trachea and lungs, of what type of tissue is the respiratory mucosa made?
   a. simple squamous epithelium
   b. simple columnar epithelium
   c. pseudostratified ciliated columnar epithelium
   d. non-keratinized stratified squamous epithelium
   e. hyaline cartilage

8. As air is being inspired into the respiratory tract, through which of the following structures would a molecule of oxygen pass first?
   a. main bronchus
   b. alveolar duct
   c. glottis
   d. oropharynx
   e. trachea

9. Which of the following structures does NOT have cartilage?
   a. bronchiole
   b. main (primary) bronchus
   c. segmental (tertiary) bronchus
   d. larynx
   e. trachea

10. Which statement would most likely be true of a person whose type II cells are not functioning?
   a. Surface tension in the alveoli would be higher than normal.
   b. The $P_{O2}$ in the systemic arteries would be higher than normal.
   c. The person’s vital capacity would be higher than normal.
   d. All of the responses above are correct.
   e. None of the responses above are correct.
11. The fact that the pressure of a gas is inversely proportional to the volume that the gas occupies is the main idea of ____________ law.
   a. Boyle’s
   b. Dalton’s
   c. Henry’s
   d. Hubley’s
   e. Starling’s

12. Which of the following muscles is **NOT** useful for inspiration?
   a. diaphragm
   b. external intercostals
   c. rectus abdominis
   d. sternocleidomastoids
   e. All of the muscles listed above **ARE** useful for inspiration.

13. Under normal conditions, the P\textsubscript{O\textsubscript{2}} of air in the alveoli is __________ , and the P\textsubscript{O\textsubscript{2}} in the systemic tissues is ____________ .
   a. 104 mm Hg; < 40 mm Hg
   b. 104 mm Hg; > 45 mm Hg
   c. 45 mm Hg; < 40 mm Hg
   d. > 45 mm Hg; 104 mm Hg

14. Cellular respiration keeps P\textsubscript{CO\textsubscript{2}} in the systemic tissues low and P\textsubscript{O\textsubscript{2}} in the systemic tissues high.
   a. The statement above is true.
   b. The statement above is false.

15. During expiration, which of the following conditions is true?
   a. Volume of the thoracic cavity increases and intrapulmonary pressure increases.
   b. Volume of the thoracic cavity increases and intrapulmonary pressure decreases.
   c. Volume of the thoracic cavity decreases and intrapulmonary pressure increases.
   d. Volume of the thoracic cavity decreases and intrapulmonary pressure decreases.
For questions 16 and 17 consider the following chemical reaction: \( \text{Hb} + n\text{O}_2 = \text{Hb(O}_2)_n \)

16. An increase in \( P_{\text{O}_2} \)
a. makes the reaction proceed more to the right.
b. makes the reaction proceed more to the left.
c. increases the amount of Hb.

17. As blood passes through the capillaries in skeletal muscles
a. the net direction of the reaction is from left to right.
b. the reaction proceeds in equal amounts in both directions.
c. the net direction of the reaction is from right to left.

18. Which one of the following statements is true?
a. The sympathetic nervous system increases the rate of breathing.
b. The parasympathetic nervous system decreases the rate of breathing.
c. Both of the responses above are true.
d. None of the responses above is true.

19. Which one of the following equations properly shows the formation of bicarbonate ions from carbon dioxide?
a. \( \text{CO}_2 + \text{O}_2 = \text{H}_2\text{CO}_3 = \text{HCO}_3^- + \text{H}^- \)
b. \( \text{CO} + \text{H}_2\text{O} = \text{H}_2\text{CO}_2 = \text{HCO}_3^- + \text{H} \)
c. \( \text{CO}_2 + \text{H}_2\text{O} = \text{HCO}_3^- + \text{H}^- = \text{H}_2\text{CO}_3 \)
d. \( \text{CO}_2 + \text{H}_2\text{O} = \text{HCO}_3^- = \text{H}_2\text{CO}_3 + \text{H}^- \)
e. \( \text{CO}_2 + \text{H}_2\text{O} = \text{H}_2\text{CO}_3^- = \text{H}^+ + \text{HCO}_3^- \)

20. As the amount of \( \text{CO}_2 \) in the blood increases,
a. the amount of bicarbonate increases and the pH increases.
b. the amount of bicarbonate decreases and the pH decreases.
c. the amount of bicarbonate decreases and the pH increases.
d. the amount of bicarbonate increases and the pH decreases.
21. Under normal conditions, approximately what percentage of CO$_2$ in the blood is bound to hemoglobin?
   a. 1.5%
   b. 10%
   c. 20%
   d. 70%
   e. 95%

22. What nerve carries motor signals to the diaphragm?
   a. vagus
   b. facial
   c. phrenic
   d. All of the responses above are correct.
   e. None of the responses above is correct.

23. George has a disease that has caused pulmonary edema; his lungs are full of fluid. Given this problem, what is also likely true of George?
   a. metabolic acidosis
   b. metabolic alkalosis
   c. respiratory acidosis
   d. respiratory alkalosis

24. Which one of the following conditions would most likely cause a decrease in the rate of pulmonary ventilation?
   a. hypercapnia
   b. low levels of CO$_2$
   c. low levels of oxygen
   d. abnormally low pH
   e. None of the responses above is correct.

25. Which of the following statements best defines “apnea”?
   a. increased rate of breathing
   b. decreased rate of breathing
   c. absence or cessation of breathing
   d. absence of fluid in the lungs
   e. abnormal bronchoconstriction (as in asthma)
26. Which one of the following terms has the same meaning as “gastrointestinal tract”?
   a. intestine
   b. colon
   c. alimentary canal
   d. pharynx
   e. digestive system

27. The _________ is an accessory organ of the digestive system.
   a. stomach
   b. liver
   c. duodenum
   d. rectum
   e. More than one of the responses above is correct.

For questions 28 through 30, select your responses from the following list:
   a. mechanical digestion
   b. chemical digestion
   c. ingestion
   d. absorption
   e. More than one of the responses above is correct.

28. Which process is accomplished by the small intestine?
29. Which process is accomplished in or by the mouth?
30. Which process is most directly assisted by the pancreas?
31. The mucosa of the digestive tract contains the
   a. lamina propria.
   b. muscularis externa.
   c. sphincters.
   d. adventitia.
   e. More than one of the responses above is correct.
32. An extra thick layer of circular muscle is most likely to be found
   a. where extra mucus is secreted.
   b. where peristalsis occurs.
   c. where one organ of the digestive tract empties into another.
   d. where plicae circulares are found.
   e. at the adventitia.

33. The gums of the mouth are properly called the
   a. labial frenulum.
   b. uvula.
   c. palate.
   d. gingivae.
   e. vestibule.

34. Where are taste buds found?
   a. lingual papillae
   b. lingual frenulum
   c. root
   d. vestibule
   e. gingivae

35. Joe’s intrinsic and extrinsic salivary glands have stopped functioning. Which of the following problems
   is Joe likely to experience?
   a. Joe’s digestive system does not produce amylase.
   b. Joe has difficulty swallowing.
   c. Joe cannot masticate his food.
   d. All of the responses above are correct.
   e. None of the responses above is correct.

36. Which structure found within salivary glands produces thin, watery saliva?
   a. lingual cell
   b. parotid cell
   c. serous cell
   d. mucous cell
   e. vestibular cell
37. Which structure is normally involved in the passage of food?
   a. posterior nasal aperture
   b. glottis
   c. nasopharynx
   d. laryngopharynx
   e. vestibular fold

38. The ________ is found where the esophagus joins the stomach.
   a. pyloric sphincter
   b. cardiac orifice
   c. ileocecal valve
   d. hiatal sphincter
   e. More than one of the responses above is correct.

39. What would most likely happen if the parietal cells in your stomach stopped functioning?
   a. The amount of pepsinogen in your stomach would decrease.
   b. The amount of vitamin B12 absorbed by your body would increase.
   c. The amount of hydrochloric acid in your stomach would increase.
   d. The pH of the stomach would increase.
   e. All of the responses above are equally likely.

40. The muscularis externa of the stomach is specially designed to provide which one of the following functions?
   a. production of bile
   b. mechanical digestion
   c. chemical digestion
   d. production of intrinsic factor

41. Which of the following events is a normal part of the intestinal phase of digestion?
   a. increased levels of secretin and CCK
   b. increased contractions of the gastric muscularis externa
   c. increased secretions by parietal and chief cells
   d. constriction of the hepatopancreatic ampulla
   e. inhibition of contractions of the gall bladder
42. Which structure does **NOT** increase absorptive surface area of the small intestine?
   a. villi.
   b. microvilli.
   c. plicae circulares.
   d. rugae.

43. Which part of the stomach is anatomically the greatest distance from the duodenum?
   a. pylorus
   b. lesser curvature
   c. body
   d. fundus
   e. cecum

44. Assuming there is bile in the gall bladder, then which one of the following ducts would have to be blocked to completely prevent bile from entering the duodenum?
   a. common hepatic duct
   b. common bile duct
   c. cystic duct
   d. left hepatic duct
   e. right hepatic duct

45. Which one of the following functions is **NOT** a function of the liver?
   a. secrete chemicals that emulsify fats
   b. conversion of lactic acid to glucose
   c. removal of excess hormones and antibodies from the blood
   d. production of plasma proteins
   e. secretion of enzymes into the duodenum

46. Which structure is most responsible for providing the cells in a liver lobule with oxygen?
   a. portal arteriole
   b. portal venule
   c. central vein
   d. bile duct
47. Which of the following terms does **NOT** directly relate to the exocrine functions of the pancreas?
   a. acinar cells
   b. islet of Langerhans
   c. pancreatic juice
   d. amylase
   e. protease

48. As glucose is being absorbed from the intestine into the bloodstream, the _______ cells of the pancreas increase secretion of __________.
   a. alpha; glucagon
   b. alpha; insulin
   c. acini; glucagon
   d. beta; glucagon
   e. beta; insulin

49. Proteins are digested by _______ in the stomach, and by __________ in the small intestine.
   a. trypsin; chymotrypsin
   b. chymotrypsin; pepsinogen
   c. pepsin; trypsin
   d. pepsinogen; chymotrypsin
   e. trypsin, pepsinogen

50. The ileocecal valve is found where the small intestine joins the
   a. appendix.
   b. fundus.
   c. pylorus.
   d. rectum.
   e. cecum.