Multiple choice. Mark the one best answer of your choice (4 pts each).

1. Which of the following structures is NOT involved in mechanical digestion?
   A. liver
   B. tongue
   C. stomach
   D. teeth

2. IgG is the most common form of _____ found in the blood.
   A. interleukin
   B. antibody
   C. lymphocyte
   D. blood type

3. Which of the following is critical in the digestion of fats?
   A. amylase
   B. bile
   C. cecum
   D. chyme

4. The respiratory membrane in the alveoli is composed of _____.
   A. hyaline cartilage
   B. simple squamous epithelium
   C. ciliated pseudostratified epithelium
   D. stratified squamous epithelium

5. When the intrapulmonary pressure (P_{pul}) falls below atmospheric pressure (P_{atm}), which of the following occurs?
   A. inspiration begins
   B. the partial pressures of CO_2 and O_2 become reversed
   C. the diaphragm contracts
   D. expiration begins

6. What type of blood cell is responsible for long-term “memory” of pathogens?
   A. red blood cell (RBC)
   B. neutrophil
   C. B cell
   D. helper T (T_H) cell

7. Which of the following characteristics of lung tissue accounts for its ability to recoil?
   A. secretion of surfactant
   B. presence of elastic connective tissue
   C. the structure of the respiratory membrane
   D. presence of goblet cells and ciliated cells

8. How do lymphocytes become immunocompetent?
   A. positive selection
   B. negative selection
   C. positive selection, followed by negative selection
   D. negative selection, followed by positive selection

9. APCs present antigen fragments on:
   A. antibodies.
   B. complement protein.
   C. MHC proteins.
   D. serum proteins.

10. Which of the following cells are endocrine in function?
   A. acinar cells
   B. islet of Langerhans cells
   C. hepatocytes
   D. chief cells

11. Urine exits the bladder via:
   A. the nephron.
   B. the ureters.
   C. the glomerulus.
   D. the urethra.

12. Brush border enzymes are located in the:
   A. trachea.
   B. stomach.
   C. small intestine.
   D. pancreas.

13. Specialized structures important for absorption are called _____.
   A. microvilli
   B. fenestration slits
   C. macula densa
   D. tight junctions

14. The churning action of the stomach is achieved by _____.
   A. the myometrium
   B. an oblique layer of smooth muscle
   C. circular and longitudinal layers of smooth muscle
   D. circular folds in the mucosa

15. Ingested carbohydrates are absorbed by the body as:
    A. glucose.
    B. maltose.
    C. monosaccharides.
    D. ATP.

16. Bile is released from the gallbladder via the:
    A. gall duct.
    B. bile duct.
    C. hepatic duct.
    D. cystic duct.

17. The only major nutrient group that is chemically digested in the stomach is:
    A. protein.
    B. polysaccharide.
    C. lipid.
    D. disaccharide.

18. Helper T (TH) cells are activated by:
    A. vasoconstrictors.
    B. MHC proteins.
    C. interleukin-1 (IL-1).
    D. interleukin-2 (IL-2).

19. Cells that secrete gastrin are called:
    A. type I cells.
    B. type II cells.
    C. chief cells.
    D. parietal cells.

20. Oh, no! You've just been told that your body can no longer synthesize ATP on its own. Which of the following processes will be affected?
    A. breakdown of lipids
    B. inspiration
    C. absorption of monosaccharides
    D. production of filtrate in the kidney

True or false. Mark each of the following statements with a T (for true) or an F (for false) (4 pts each).

_____ 21. The role of pleural fluid is to reduce friction between the pleurae.

_____ 22. The main site for water and vitamin absorption is the small intestine.

_____ 23. Chemical digestion of proteins requires a low pH environment.

_____ 24. Antibodies attack and kill pathogens.

_____ 25. Two locations where amylase are active include the salivary glands and the pancreas.

_____ 26. The presence of smooth muscle in the lining of the stomach means that the stomach is relatively inelastic.

_____ 27. The dorsal respiratory group (DRG) sets the pace for respiration.

_____ 28. There are normally two ureters but only one urethra.

_____ 29. The digestive process only begins once the body has consumed food.

_____ 30. The linings of the esophagus, the large intestine and the alveoli are modified to protect against abrasion.

Matching. Match each of the definitions below with the term that best fits (4 pts each).

_____ 31. Smallest conducting respiratory passageways
_____ 32. Separates the oral and nasal cavities
_____ 33. Major nerve; stimulates the diaphragm
_____ 34. Food passageway posterior to the trachea
_____ 35. Closes off the larynx during swallowing
_____ 36. Windpipe
_____ 37. Actual site of gas exchange
_____ 38. Pleural layer covering the thorax wall
_____ 39. Pleural layer covering the lungs
_____ 40. Lumen of the larynx

A. Alveoli
B. Bronchioles
C. Conchae
D. Epiglottis
E. Esophagus
F. Glottis
G. Palate
H. Parietal pleura
I. Phrenic nerve
J. Main bronchi
K. Trachea
L. Visceral pleura

41. In the space below, write out the chemical reaction catalyzed by carbonic anhydrase (8 pts).

_____

42. Where does this reaction occur? _____ (6 pts)

43. True or false: This reaction is reversible. _____ (4 pts)

44. Explain the role of this enzyme in the systemic capillaries vs. in the pulmonary capillaries. (12 pts)

_____
_____
_____
_____
_____
_____
_____
_____

45. Describe the effects of dissolved CO_2 on blood pH. In your answer, explain how the body can regulate blood pH by altering your respiratory rate (12 pts).

45. For each of the following parts of the body, list the specific tissue type found (i.e., not just “epithelium”): (6 pts each)

lining inside of trachea

lining of oropharynx

lining of small intestine

respiratory membrane

46. Pick one of the examples above and explain why this tissue’s structure is ideally suited for its function in that part of the body (12 pts).

47. Compare and contrast cell-mediated and humoral immunity. In your answer, don't forget to mention which cells function in each, and what they do (12 pts).

Extra credit. Distinguish between Boyle's Law and Henry's Law (8 pts).