

BIOL2310 Anatomy & Physiology II  
Spring 2006  
Exam 4

Moniker: Vein

Lab Section: 1

Test Number: 5

1. There are 50 multiple choice questions on this exam, each worth 2 points.
2. Write all of your answers on the answer sheet.
3. Be sure to write the test number on your answer sheet. There are various versions of the test. Without the correct test number, there is no way to grade it.

1. What statement below is FALSE about why we breathe?
  - a. inspiration begins in the medullary respiratory center in response to specific stimuli
  - b. expiration begins when the expiratory nerves are excited
  - c. action potentials are produced that stimulate respiratory muscles to contract
  - d. regulatory mechanisms of ventilation include both nervous and chemical control
  
2. The cardiac output increases blood flow to the lungs five-fold in response to exercise. What does a healthy lung NOT do to compensate for this?
  - a. increasing the number of open capillaries
  - b. distending open capillaries
  - c. increasing capillary pressure to develop edema
  - d. increasing the rate of flow through the capillaries
  
3. Recall the major regulatory mechanisms for increasing the rate of respiration. Which mechanism below **decreases** the rate of respiration?
  - a. medullary chemoreceptors respond to a decrease in pH
  - b. carotid chemoreceptors respond to a decrease in oxygen
  - c. stretch receptors in the lungs are stimulated
  - d. pain receptor is stimulated
  
4. What does NOT occur in the aging respiratory system?
  - a. increased tidal volume
  - b. increased dead space
  - c. thickening of respiratory membrane
  - d. increased vital capacity

For the next three questions, refer to this information.

Normal:  $p\text{CO}_2 = 35 - 45$        $\text{HCO}_3 = 22-26$

Patient:  $\text{pH} = 7.47$   
 $p\text{CO}_2 = 33$   
 $\text{HCO}_3 = 25$

5. What are possible symptoms the patient may experience or could have experienced?
  - a. hyperexcitability of CNS including spasms and tetany
  - b. depression of CNS including disorientation and coma
  
6. Is the patient totally or partially compensated?
  - a. totally compensated
  - b. partially compensated
  
7. What is your diagnosis?
  - a. metabolic acidosis
  - b. metabolic alkalosis
  - c. respiratory acidosis
  - d. respiratory alkalosis
  
8. The maintenance and volume and composition of body fluids is the basic function of the
  - a. circulatory system
  - b. respiratory system
  - c. urinary system
  - d. digestive system

9. Movement of air into and out of the lungs is called
  - a. pulmonary ventilation
  - b. filtration
  - c. perfusion
  - d. diffusion
  
10. The passageway that serves both the respiratory and digestive systems is the
  - a. larynx
  - b. trachea
  - c. esophagus
  - d. pharynx
  
11. The organ containing the vocal cords is the
  - a. larynx
  - b. trachea
  - c. esophagus
  - d. pharynx
  
12. The cartilaginous flap that prevents food from entering the breathing passageway is the
  - a. false vocal cords
  - b. superior esophageal sphincter
  - c. glottis
  - d. epiglottis
  
13. Gas exchange in the lungs occurs between blood in capillaries and air in
  - a. bronchioles
  - b. alveoli
  - c. surfactant
  - d. secondary bronchi
  
14. The primary breathing muscles for inspiration are the
  - a. diaphragm and internal intercostals
  - b. diaphragm and external intercostals
  - c. diaphragm and rectus abdominis
  - d. external and internal intercostals
  
15. When the lungs are at rest between breathing cycles, the air pressure in the lungs is
  - a. the same as atmospheric pressure
  - b. less than atmospheric pressure
  - c. more than atmospheric pressure
  - d. not related to atmospheric pressure
  
16. The expansion of the thoracic cavity and lungs causes
  - a. a decrease in lung volume and an increase in air pressure within the lungs
  - b. an increase in lung volume and an increase in air pressure within the lungs
  - c. an increase in lung volume and a decrease in air pressure within the lungs
  - d. a decrease in lung volume and a decrease in air pressure within the lungs

17. A slightly negative pressure within the pleural cavity is
- a. unimportant to lung function
  - b. essential for lung function
  - c. detrimental to lung function
  - d. a rare condition, indicating a potential problem
18. The collapse of the alveoli following expiration is prevented by
- a. a thin film of water lining the alveoli
  - b. a thin film of mucous lining the alveoli
  - c. atmospheric air pressure
  - d. surfactant
19. Breathing is controlled by the respiratory center located in the
- a. cerebrum
  - b. medulla oblongata and pons
  - c. midbrain
  - d. cerebellum
20. The amount of air that cannot be expelled from the lungs is known as the
- a. expiratory reserve volume
  - b. vital capacity
  - c. inspiratory reserve volume
  - d. residual volume
21. The primary stimulus causing the respiratory control center to start inspiration is
- a. a decrease in CO<sub>2</sub> and an increase in H<sup>+</sup> concentrations in the blood
  - b. a decrease in both CO<sub>2</sub> and H<sup>+</sup> concentrations in the blood
  - c. an increase in both CO<sub>2</sub> and H<sup>+</sup> concentrations in the blood
  - d. a decrease in oxygen concentration in the blood
22. The process of gas exchange in the lungs and in body tissues is by
- a. diffusion
  - b. active transport
  - c. osmosis
  - d. passive transport
23. Oxygen is primarily transported
- a. dissolved in the plasma
  - b. combined with hemoglobin in the red blood cells
  - c. in combination with plasma proteins
  - d. in bicarbonate ions
24. Carbon dioxide is primarily transported
- a. dissolved in the plasma
  - b. combined with hemoglobin in the red blood cells
  - c. in combination with plasma proteins
  - d. in bicarbonate ions
25. More oxygen is released from hemoglobin if
- a. there are high levels of oxygen
  - b. there are high levels of carbon dioxide
  - c. there is an increase in pH
  - d. there is a decrease in temperature
26. The partial pressure of oxygen (pO<sub>2</sub>) is 20 at the tissues. It is 95 in the capillary. Which way will oxygen diffuse?
- a. to the tissue
  - b. to the capillary
  - c. it will not diffuse, energy is required for active transport to the tissue
  - d. it will not diffuse, it can't pass through the capillary barrier

27. The functional unit of the kidney is the
- renal pyramid
  - nephron
  - collecting duct
  - renal column
28. The correct sequence of parts of a renal tubule is
- loop of Henle, proximal tubule, distal tubule
  - proximal tubule, distal tubule, loop of Henle
  - proximal tubule, loop of Henle, distal tubule
  - distal tubule, loop of Henle, proximal tubule
29. Most of the tubular reabsorption occurs in the
- proximal tubule
  - loop of Henle
  - collecting duct
  - distal tubule
30. The reabsorption of water under the influence of ADH occurs in the
- proximal tubule
  - loop of Henle
  - collecting duct
  - distal tubule
31. The organ that filters blood plasma and forms urine is the
- liver
  - kidney
  - spleen
  - urinary bladder
32. Select the process that is NOT involved in urine formation
- filtration
  - glomerular capsular absorption
  - tubular reabsorption
  - tubular secretion
33. The major function of urine formation is to
- remove all nitrogen from the body
  - remove half of the nitrogenous wastes and electrolytes
  - excrete as little water as possible
  - maintain the composition and volume of blood at relatively constant levels
34. Antidiuretic hormone is released by the
- kidneys
  - posterior pituitary
  - anterior pituitary
  - hypothalamus

35. Aldosterone is secreted by the
- adrenal cortex
  - adrenal medulla
  - anterior pituitary
  - posterior pituitary
36. The normal pH range of body fluids is
- 7.55 – 7.65
  - 7.15 – 7.25
  - 7.35 – 7.45
  - 6.95 – 7.05
37. Which organ stores urine temporarily?
- kidney
  - ureter
  - gallbladder
  - bladder
38. Which is the U-shaped portion of renal tubule?
- nephron
  - glomerulus
  - Loop of Henle
  - Proximal convoluted tubule
39. What is the "passage of water and solutes from glomerulus into glomerular capsule"?
- filtration
  - secretion
  - excretion
  - reabsorption
40. What is the "recovery of needed materials from filtrate into blood"?
- filtration
  - secretion
  - excretion
  - reabsorption
41. Which hormone below causes the kidney to excrete more urine?
- antidiuretic hormone (ADH)
  - aldosterone
  - atrial natriuretic hormone (ANH)
  - renin
42. What is the major method of transport of sodium ions in the nephron?
- active transport
  - passive transport
  - osmosis
  - diffusion

43. Select the true statement below.
- Electrolytes are totally reabsorbed by the blood.
  - Water is lost from the body only in urine.
  - About 99% of the water from the filtrate is reabsorbed.
  - Urine volume is increased when water intake is decreased.
44. Select the false statement below.
- Urine contains waste and excessive materials removed from the blood.
  - ADH decreases the permeability of the distal tubules and collecting ducts to water.
  - Kidneys help to regulate the pH of body fluids by secreting excess H<sup>+</sup> into the filtrate.
  - Water and electrolyte balance in body fluids is essential for normal cell functioning.
45. In the kidney, a substance is freely filtered, but then partially reabsorbed. The rate of excretion equals
- filtration rate
  - filtration rate – reabsorption rate
  - filtration rate + tubular secretion rate
  - filtration rate + reabsorption rate
46. What does NOT happen when there are high levels of sodium in the blood?
- thirst may be activated
  - blood osmolality decreases
  - fluid is conserved via ADH
  - salt sucks water from cells to bloodstream
47. Where is the highest osmolality in the kidney?
- Renal cortex – proximal & distal loops
  - Inner medulla – Loop of Henle
48. Which arteriole takes blood flow into the glomerulus?
- Efferent
  - Afferent
49. What is regulated by the kidney?
- water
  - electrolytes
  - pH of the blood
  - all of the above
50. What substance is produced by the kidney in response to low blood pressure?
- antidiuretic hormone (ADH)
  - aldosterone
  - atrial natriuretic hormone (ANH)
  - renin

Moniker: vein

Lab Section: 1

Test Number: 5

BIOL 2310 Exam 4

- |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|
| 1. <u>B</u>              | 21. <u>DC</u>            | 41. <u>AC</u>            |
| 2. <u>C</u>              | 22. <u>A</u>             | 42. <u>A</u>             |
| <del>3. <u>AC</u></del>  | 23. <u>B</u>             | 43. <u>C</u>             |
| 4. <u>D</u>              | 24. <u>D</u>             | 44. <u>B</u>             |
| <del>5. <u>BA</u></del>  | 25. <u>B</u>             | 45. <u>B</u>             |
| 6. <u>B</u>              | 26. <u>A</u>             | <del>46. <u>CB</u></del> |
| 7. <u>D</u>              | 27. <u>B</u>             | 47. <u>B</u>             |
| 8. <u>C</u>              | 28. <u>C</u>             | 48. <u>B</u>             |
| 9. <u>A</u>              | 29. <u>BA</u>            | 49. <u>D</u>             |
| 10. <u>D</u>             | 30. <u>D</u>             | <del>50. <u>AD</u></del> |
| 11. <u>A</u>             | 31. <u>B</u>             |                          |
| 12. <u>D</u>             | <del>32. <u>DB</u></del> |                          |
| 13. <u>B</u>             | <del>33. <u>CD</u></del> |                          |
| <del>14. <u>BA</u></del> | <del>34. <u>CB</u></del> |                          |
| <del>15. <u>BA</u></del> | <del>35. <u>CA</u></del> |                          |
| <del>16. <u>BC</u></del> | 36. <u>C</u>             |                          |
| 17. <u>B</u>             | 37. <u>D</u>             |                          |
| 18. <u>D</u>             | 38. <u>C</u>             |                          |
| 19. <u>B</u>             | 39. <u>A</u>             |                          |
| 20. <u>D</u>             | 40. <u>D</u>             |                          |

$$\frac{+72 + 5}{100} = 77 \text{ B}$$

$$-14 \times 2 = -28$$