

## Biol-131 Exam 3 B

Name \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) A byproduct of protein catabolism, \_\_\_\_\_ constitutes approximately one-half of all nitrogenous waste.  
A) ammonia      B) azotemia      C) urea      D) uric acid      E) creatinine
  
- 2) Which of the following would slow down gas exchange between the blood and alveolar air?  
A) An increase in respiratory rate  
B) An increase in alveolar surface area  
C) An increase in membrane thickness  
D) A decrease in nitrogen solubility  
E) A decrease in membrane thickness
  
- 3) Aldosterone acts on the \_\_\_\_\_.  
A) proximal convoluted tubule  
B) distal convoluted tubule  
C) medullary portion of the collecting duct  
D) glomerulus  
E) descending limb of the nephron loop
  
- 4) In response to a drop in overall blood pressure, \_\_\_\_\_ stimulates constriction of the glomerular inlet and even greater constriction of the outlet.  
A) parathyroid hormone  
B) angiotensin II  
C) sodium chloride  
D) aldosterone  
E) azotemia
  
- 5) Where is the greatest volume of water in the body found?  
A) Blood plasma and lymph  
B) Transcellular fluid  
C) Intracellular fluid (ICF)  
D) Extracellular fluid (ECF)  
E) Tissue (interstitial) fluid
  
- 6) Renin hydrolyzes angiotensinogen, which is released from the \_\_\_\_\_, to form angiotensin I.  
A) lungs      B) heart      C) kidneys      D) spleen      E) liver

- 7) Gas transport is the process of carrying gases from the alveoli to the systemic tissues and vice versa.
- A) True
  - B) False
- 8) Crude sounds are formed into intelligible speech by all of the following *except* the \_\_\_\_\_.
- A) pharynx
  - B) tongue
  - C) oral cavity
  - D) lips
  - E) epiglottis
- 9) Hypocalcemia stimulates \_\_\_\_\_.
- A) an increase in blood urea nitrogen
  - B) secretion of renin
  - C) vasoconstriction of the afferent arterioles
  - D) secretion of parathyroid hormone
  - E) a decrease in aldosterone production
- 10) What is the function of aldosterone?
- A) It reduces  $\text{Na}^+$  reabsorption and  $\text{K}^+$  secretion.
  - B) It increases both  $\text{Na}^+$  and  $\text{K}^+$  secretion.
  - C) It increases both  $\text{Na}^+$  and  $\text{K}^+$  reabsorption.
  - D) It increases  $\text{Na}^+$  reabsorption and  $\text{K}^+$  secretion.
  - E) It causes the urine to be more diluted.
- 11) Breathing is controlled solely by the medulla oblongata and pons.
- A) True
  - B) False
- 12) Which of the following is a direct result of antidiuretic hormone?
- A) Decreased urine molarity
  - B) Increased urine acidity
  - C) Increased urine salinity
  - D) Increased urine volume
  - E) Decreased urine volume
- 13) Which of the following is a lung disease marked by abnormally few but large alveoli?
- A) Cor pulmonale
  - B) Atelectasis
  - C) Emphysema
  - D) Pulmonary hemosiderosis
  - E) Collapsed lung

- 14) The vagus and glossopharyngeal nerves carry afferent signals from peripheral chemoreceptors to a chemosensitive area in the \_\_\_\_\_.
- A) ventral respiratory group
  - B) dorsal respiratory group
  - C) pons
  - D) medulla oblongata
  - E) pontine respiratory group
- 15) Each alveolus is surrounded by a web of blood capillaries supplied by the \_\_\_\_\_.
- A) inferior vena cava
  - B) superior vena cava
  - C) pulmonary vein
  - D) aorta
  - E) pulmonary artery
- 16) The medial concavity of the kidney is called the \_\_\_\_\_, which admits the renal nerves, blood vessels, lymphatic vessels, and ureter.
- A) medulla
  - B) corpuscle
  - C) cortex
  - D) hilum
  - E) capsule
- 17) What is the principal cation of the ECF?
- A)  $K^+$
  - B)  $Ca^{2+}$
  - C)  $Cl^-$
  - D)  $P_i$
  - E)  $Na^+$
- 18) The expansion of the lungs during inspiration generates a pressure gradient causing air to flow into the lungs. This is an example of Boyle's law.
- A) True
  - B) False
- 19) Hypocapnia will lead to which of the following conditions?
- A) Hypoventilation due to acidosis
  - B) Hypoventilation due to alkalosis
  - C) Hyperventilation due to alkalosis
  - D) Hyperventilation due to acidosis
- 20) The lungs contains a total of five \_\_\_\_\_.
- A) laryngeal cartilages
  - B) segmental bronchi
  - C) lobes
  - D) tracheal cartilages
  - E) choanae

- 21) The transition from an afferent arteriole to an efferent arteriole occurs in the \_\_\_\_\_.
- A) medulla
  - B) vasa recta
  - C) peritubular capillaries
  - D) cortical radiate veins
  - E) glomerulus
- 22) Nitrogen bubbles can form in the blood and other tissues when a scuba diver ascends too rapidly, producing a syndrome called \_\_\_\_\_.
- A) pulmonary barotrauma
  - B) pulmonary edema
  - C) hyperbaric disease
  - D) decompression sickness
  - E) cerebral embolism
- 23) The rate of oxygen diffusion is affected by the pressure gradient of carbon dioxide.
- A) True
  - B) False
- 24) Which of the following correctly traces blood flow from the renal artery into the renal cortex?
- A) Segmental a. → arcuate a. → interlobar a. → interlobular a.
  - B) Arcuate a. → interlobar a. → afferent arteriole → interlobular a.
  - C) Interlobar a. → interlobular a. → segmental a. → arcuate a.
  - D) Afferent arteriole → interlobular a. → arcuate a. → interlobar a.
  - E) Segmental a. → interlobar a. → arcuate a. → interlobular a.
- 25) Hypernatremia is a plasma \_\_\_\_\_ concentration above normal.
- A)  $\text{Cl}^-$
  - B)  $\text{P}_i$
  - C)  $\text{Ca}^{2+}$
  - D)  $\text{Na}^+$
  - E)  $\text{K}^+$
- 26) Which of the following is caused by the chemical reactions of gases of the respiratory system?
- A) Regulation of blood pressure
  - B) Aids in defecation
  - C) Regulation of pH
  - D) The synthesis of vasodilators
- 27) In the thick segment of the ascending limb of the nephron loop,  $\text{K}^+$  reenters the cell from the interstitial fluid via the \_\_\_\_\_.  $\text{K}^+$  is then secreted into the tubular fluid.
- A) vasa recta
  - B)  $\text{Na}^+\text{-K}^+$  pump
  - C) countercurrent exchange
  - D) countercurrent multiplier
  - E) juxtaglomerular apparatus

- 28) Upon inspiration, what is the name of the air in the conducting zone that is not available for gas exchange?
- A) Tracheal dead space
  - B) Anatomical dead space
  - C) Conducting dead space
  - D) Alveolar dead space
- 29) Mucus plays an important role in cleansing inhaled air. It is produced by \_\_\_\_\_ of the respiratory tract.
- A) goblet cells
  - B) great alveolar cells
  - C) squamous alveolar cells
  - D) ciliated cells
  - E) the pleurae
- 30) Which of the following is *not* reabsorbed by the proximal convoluted tubule?
- A) Potassium
  - B) Hydrogen ions
  - C) Urea
  - D) Sodium chloride
  - E) Water
- 31) In which compartment would fluid accumulate in edema?
- A) Transcellular fluid
  - B) Tissue (interstitial) fluid
  - C) Blood plasma
  - D) Intracellular fluid
  - E) Lymph
- 32) How is the vital capacity calculated?
- A) Respiratory volume + tidal volume
  - B) Expiratory reserve volume + tidal volume + inspiratory reserve volume
  - C) Expiratory reserve volume + tidal volume
  - D) Inspiratory reserve volume + tidal volume
  - E) Inspiratory reserve volume + expiratory volume
- 33) How is calcium concentration in the body regulated?
- A) By the parasympathetic nervous system
  - B) By sodium and calcium concentrations in the plasma
  - C) By hormones
  - D) By the sympathetic nervous system
  - E) By chloride and phosphate concentrations in the plasma

- 34) If one inspires through their nose, which of the following answers has the correct order of structures the air would move through?
- A) Nares → Vestibule → Nasal Cavity → Nasopharynx → Oropharynx → Laryngopharynx → Larynx → Trachea → Primary Bronchus → Secondary Bronchus → Tertiary Bronchus → Bronchiole → Terminal Bronchiole → Respiratory Bronchiole → Alveolar Duct → Alveolar Sac → Alveolus
  - B) Nares → Nasal Cavity → Vestibule → Nasopharynx → Oropharynx → Laryngopharynx → Larynx → Trachea → Primary Bronchus → Secondary Bronchus → Tertiary Bronchus → Bronchiole → Terminal Bronchiole → Respiratory Bronchiole → Alveolar Duct → Alveolar Sac → Alveolus
  - C) Nares → Nasal Cavity → Vestibule → Nasopharynx → Oropharynx → Laryngopharynx → Larynx → Trachea → Primary Bronchus → Secondary Bronchus → Tertiary Bronchus → Bronchiole → Respiratory Bronchiole → Terminal Bronchiole → Alveolar Duct → Alveolar Sac → Alveolus
  - D) Nares → Vestibule → Nasal Cavity → Nasopharynx → Oropharynx → Laryngopharynx → Larynx → Trachea → Bronchiole → Respiratory Bronchiole → Terminal Bronchiole → Primary Bronchus → Secondary Bronchus → Tertiary Bronchus → Alveolar Duct → Alveolar Sac → Alveolus
- 35) How is alveolar air different than inspired air?
- A) Alveolar air has a higher  $\text{PH}_2\text{O}$  than inspired air.
  - B) Alveolar air has a lower  $\text{PCO}_2$  than inspired air.
  - C) Alveolar air has a higher  $\text{PN}_2$  than inspired air.
  - D) Alveolar air has a higher  $\text{PO}_2$  than inspired air.
- 36) A renal pyramid voids urine into the \_\_\_\_\_.
- A) renal papilla
  - B) ureter
  - C) minor calyx
  - D) major calyx
  - E) renal medulla
- 37) The blood transports more  $\text{CO}_2$  in the form of \_\_\_\_\_ than in any other form.
- A) bicarbonate ions
  - B) carbaminohemoglobin
  - C) carboxyhemoglobin
  - D) bisphosphocarbonate
  - E) dissolved  $\text{CO}_2$  gas

- 38) The \_\_\_\_\_ innervation of the kidneys reduces urine production, while the function of its \_\_\_\_\_ innervation is unknown.
- A) peripheral; central
  - B) central; peripheral
  - C) enteric; somatic
  - D) sympathetic; parasympathetic
  - E) parasympathetic; sympathetic
- 39) The amount of air in excess of tidal volume that can be inhaled with maximum effort is the \_\_\_\_\_.
- A) expiratory reserve volume
  - B) vital capacity
  - C) inspiratory capacity
  - D) inspiratory reserve volume
  - E) residual volume
- 40) Blood plasma is filtered in the \_\_\_\_\_.
- A) renal calyx
  - B) renal tubule
  - C) renal capsule
  - D) renal corpuscle
  - E) renal column
- 41) Glucose and amino acids are reabsorbed from the glomerular filtrate by the \_\_\_\_\_.
- A) renal corpuscle
  - B) collecting duct
  - C) glomerular capillaries
  - D) proximal convoluted tubule
  - E) distal convoluted tubule
- 42) The nose is divided into right and left halves by the \_\_\_\_\_.
- A) nasal apertures
  - B) nasal septa
  - C) nasal fossae
  - D) nasal vestibules
  - E) nasal cavities
- 43) The \_\_\_\_\_ is *not* an organ of the urinary system.
- A) liver
  - B) urinary bladder
  - C) urethra
  - D) kidney
  - E) ureter

- 44) Each hemoglobin molecule can transport up to \_\_\_\_\_ oxygen molecules.  
A) 5                      B) 2                      C) 3                      D) 6                      E) 4
- 45) Hyponatremia is usually a result of hypotonic hydration.  
A) True  
B) False
- 46) During exercise, which of the following directly increases respiratory rate?  
A) Increased  $H^+$  level in the blood  
B) The Bohr effect  
C) Increased amount of  $CO_2$  in the blood  
D) Reduced oxyhemoglobin  
E) Reduced blood pH
- 47) In a state of fluid balance, average daily fluid gains and losses are equal.  
A) True  
B) False
- 48) Which of the following would reduce the glomerular filtration rate?  
A) An increase in osmotic pressure in the glomerular capsule  
B) A drop in oncotic pressure  
C) Vasodilation of the afferent arteriole  
D) Vasoconstriction of the efferent arteriole  
E) Vasoconstriction of the afferent arteriole
- 49) Which organ system excretes nitrogenous wastes?  
A) The urinary system  
B) The digestive system  
C) The cardiovascular system  
D) The respiratory system  
E) The integumentary system
- 50) In the air we breathe, which gas is found in the highest concentration?  
A) Oxygen  
B) Hydrogen  
C) Carbon dioxide  
D) Nitrogen  
E) Water vapor



- 51) A single lobe of a kidney is comprised of \_\_\_\_\_.
- A) one major calyx and all of its minor calyces
  - B) one collecting duct and all nephrons that drain into it
  - C) one pyramid and the overlying cortex
  - D) two calyces and a renal pelvis
  - E) a renal medulla and two renal columns
- 52) Which of the following is the term for a deficiency of oxygen or the inability to utilize oxygen in a tissue?
- A) Eupnea
  - B) Anoxia
  - C) Cyanosis
  - D) Hypoxia
  - E) Apoxia
- 53) What is the function of antidiuretic hormone?
- A) It promotes water conservation.
  - B) It stimulates hypothalamic osmoreceptors.
  - C) It inhibits salivation and thirst.
  - D) It targets the cerebral cortex.
  - E) It stimulates angiotensin II secretion.
- 54) Which of the following form the inner layer of the glomerular capsule and wrap around the capillaries of the glomerulus?
- A) Mesangial cells
  - B) Monocytes
  - C) Macula densa cells
  - D) Nephrocytes
  - E) Podocytes
- 55) Hypovolemia refers to a reduction in total body water while maintaining normal osmolarity.
- A) True
  - B) False