Multiple-Choice Questions

1) Functions of the respiratory system include
A) protecting respiratory surfaces from dehydration, temperature changes, or other environmental variations.
B) defending the respiratory system and other tissues from pathogenic invasion.
C) providing an extensive area for gas exchange between air and circulating blood.
D) A and C only
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 15.1
Skill Level: 1 Reviewing Facts and Terms

2) Air entering the body is filtered, warmed, and humidified by the
A) upper respiratory tract.
B) lower respiratory tract.
C) lungs.
D) alveoli.
E) all of the above
Answer: A
Diff: 1
Learning Outcome: 15.1
Skill Level: 1 Reviewing Facts and Terms

3) Microorganisms removed from incoming air by the sticky mucus of the respiratory tract are most likely destroyed by
A) toxins in the mucus.
B) the cilia.
C) gastric juice.
D) a lack of nutrients.
E) all of the above
Answer: C
Diff: 1
Learning Outcome: 15.1
Skill Level: 1 Reviewing Facts and Terms
4) The function of the nasal conchae is to
A) divide the nasal cavity into a right and a left side.
B) provide an opening into the pharynx.
C) provide a surface for the sense of smell.
D) create turbulence in the air to trap small particulates in mucus.
E) provide an opening to the outside of the body.
Answer: D
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

5) The passageways from the nasal cavity into the nasopharynx are the
A) external nares.
B) internal nares.
C) vestibules.
D) turbinates.
E) palates.
Answer: A
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

6) The portion of the nasal cavity contained within the flexible tissues of the external nose is the
A) nasopharynx.
B) vestibule.
C) internal chamber.
D) glottis.
E) nasal septum.
Answer: B
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

7) Which of the following is a single cartilage?
A) arytenoid
B) cricoid
C) cuneiform
D) corniculate
E) none of the above
Answer: B
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms
8) The common passageway shared by the respiratory and digestive systems is the
A) larynx.
B) glottis.
C) vestibule.
D) pharynx.
E) trachea.
Answer: D
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

9) The soft palate separates the
A) nasal cavity from the larynx.
B) left and right sides of the nasal cavity.
C) nasopharynx and the oral cavity.
D) external nares from the internal nares.
E) soft palate from the nasal cavity.
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

10) The pitch of a vocal sound is controlled by changing the
A) force of air.
B) tension in the vocal cords.
C) size of the laryngeal cartilage.
D) shape of the laryngeal cartilage.
E) nasal cavity.
Answer: B
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

11) The adenoids lie in the roof of the
A) nasopharynx.
B) oropharynx.
C) laryngopharynx.
D) larynx.
E) nasal cavity.
Answer: A
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms
12) The glottis is
A) the inferior margin of the soft palate.
B) a flap of elastic cartilage.
C) the passage from the pharynx to the larynx.
D) the opening to the pharynx.
E) part of the hard palate.
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

13) The elastic cartilage that shields the opening to the larynx during swallowing is the
A) thyroid cartilage.
B) cricoid cartilage.
C) corniculate cartilage.
D) cuneiform cartilage.
E) epiglottic cartilage.
Answer: E
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

14) The cartilage that extends around the entire circumference of the larynx is the
A) thyroid cartilage.
B) cricoid cartilage.
C) cuneiform cartilage.
D) arytenoid cartilage.
E) epiglottic cartilage.
Answer: B
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

15) The trachea
A) is lined by pseudostratified ciliated columnar epithelium.
B) is reinforced with C-shaped cartilages.
C) contains many mucous glands.
D) can alter its diameter when stimulated by the autonomic nervous system.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms
16) The airway that passes through the mediastinum anterior to the esophagus is the
A) pharynx.
B) bronchiole.
C) trachea.
D) alveolar duct.
E) laryngeal duct.
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

17) Airways that supply one lobe of a lung are called
A) secondary bronchi.
B) bronchioles.
C) tertiary bronchi.
D) primary bronchi.
E) alveoli.
Answer: A
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

18) The following is a list of some of the structures of the respiratory tree:
1. secondary bronchi
2. bronchioles
3. alveolar ducts
4. primary bronchi
5. respiratory bronchioles
6. alveoli
7. terminal bronchioles

The order in which air passes through these structures beginning at the trachea is
A) 4, 1, 2, 7, 5, 3, 6.
B) 4, 1, 2, 5, 7, 3, 6.
C) 1, 4, 2, 5, 7, 3, 6.
D) 1, 4, 2, 7, 5, 3, 6.
E) 2, 4, 1, 7, 5, 3, 6.
Answer: A
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms
19) How many tertiary bronchi are there in each lung?
A) 1
B) 2
C) 10
D) 15
E) 23
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

20) The lining of the trachea is
A) simple squamous.
B) ciliated cuboidal.
C) pseudostratified.
D) transitional.
E) connective tissue.
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

21) When speaking, only the first third of Joe's vocal folds vibrate, but when John speaks, half of the length of his vocal folds vibrates. Who has a higher-pitched voice?
A) Joe
B) John
Answer: A
Diff: 1
Learning Outcome: 15.2
Skill Level: 2 Reviewing Concepts

22) Which of the following is the first structure of the lower respiratory passageway?
A) nasal cavity
B) pharynx
C) larynx
D) trachea
E) bronchi
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 2 Reviewing Concepts
23) Which of the following would be found in the wall of a tertiary bronchus?
A) C rings of cartilage
B) cartilage plates only
C) a mix of cartilage plates and smooth muscle
D) smooth muscle only
E) none of the above
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 2 Reviewing Concepts

24) Harry suffers from cystic fibrosis and frequently has periods where he can hardly breathe. The problem is probably the result of
A) inflammation of the bronchi.
B) constriction of the trachea.
C) thick secretions that exceed the ability of the respiratory tract to remove them.
D) laryngospasms that occur in response to a toxic substance produced by the epithelial cells.
E) collapse of one or both lungs.
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 3 Critical Thinking & Clinical Applications

25) Kyley is singing a song. At a certain point in the song, she forces a large volume of air out of the glottis and at the same time increases the tension on her vocal cords. The sound that she produces is
A) low pitched and loud.
B) high pitched and loud.
C) low pitched and soft.
D) high pitched and soft.
E) medium pitched and soft.
Answer: B
Diff: 1
Learning Outcome: 15.2
Skill Level: 3 Critical Thinking & Clinical Applications

26) Identify the most common lethal inherited disease affecting Caucasians of Northern European descent that results from a defective gene located on chromosome 7.
A) pneumonia
B) emphysema
C) cystic fibrosis
D) asthma
E) pneumothorax
Answer: C
Diff: 1
Learning Outcome: 15.2
Skill Level: 3 Critical Thinking & Clinical Applications
27) In individuals afflicted with CF, which of the following can occur?
A) production of dense, viscous mucus
B) interruption of mucus transport
C) blockage of respiratory passageways
D) frequent bacterial infections
E) all of the above
Answer: E

Diff: 1
Learning Outcome: 15.2
Skill Level: 3 Critical Thinking & Clinical Applications

28) In this procedure, an incision is made through the anterior tracheal wall and a tube is inserted.
A) tracheostomy
B) tracheotomy
C) bronchoscopy
D) laryngotomy
E) none of the above
Answer: A

Diff: 1
Learning Outcome: 15.2
Skill Level: 3 Critical Thinking & Clinical Applications

29) Surfactant
A) protects the surface of the lungs.
B) phagocytizes small particulates.
C) replaces mucus in the alveoli.
D) is not produced sufficiently in most premature infants.
E) is not found in healthy lung tissue.
Answer: D

Diff: 1
Learning Outcome: 15.3
Skill Level: 1 Reviewing Facts and Terms

30) The walls of the alveoli are composed of
A) stratified epithelium.
B) pseudostratified epithelium.
C) simple squamous epithelium.
D) loose connective tissue.
E) reticular connective tissue.
Answer: C

Diff: 1
Learning Outcome: 15.3
Skill Level: 1 Reviewing Facts and Terms
31) The actual sites of gas exchange within the lungs are
A) bronchioles.
B) alveolar ducts.
C) pleural spaces.
D) alveoli.
E) terminal sacs.
Answer: D
Diff: 1
Learning Outcome: 15.3
Skill Level: 1 Reviewing Facts and Terms

32) Which is greater?
A) the number of lobes in the right lung
B) the number of lobes in the left lung
Answer: A
Diff: 1
Learning Outcome: 15.3
Skill Level: 1 Reviewing Facts and Terms

33) Damage to the septal cells of the lungs would result in
A) a thickening of the respiratory membrane.
B) an increased rate of gas exchange.
C) alveolar rupture.
D) alveolar collapse.
E) decreased surface tension in the water lining the alveoli.
Answer: D
Diff: 1
Learning Outcome: 15.3
Skill Level: 3 Critical Thinking & Clinical Applications

34) In a condition known as pleurisy, there is excess fluid in the pleural space. How would you expect this to affect the process of pulmonary ventilation?
A) Ventilation would require less energy.
B) Breathing would be labored and difficult.
C) It would be easier to expand the lungs on inspiration.
D) More air would be forced out during an expiration.
E) Tidal volume would increase.
Answer: B
Diff: 1
Learning Outcome: 15.3
Skill Level: 3 Critical Thinking & Clinical Applications
35) Tuberculosis results from the colonization of which microorganism?
A) Mycoplasma pneumoniae
B) Haemophilus influenzae
C) Klebsiella pneumoniae
D) Pneumocystic carinii
E) Mycobacterium tuberculosis
Answer: E
Diff: 1
Learning Outcome: 15.3
Skill Level: 3 Critical Thinking & Clinical Applications

36) The most common pneumonia that develops in AIDS patients results from infection by
A) Mycoplasma pneumoniae.
B) Haemophilus influenzae.
C) Klebsiella pneumoniae.
D) Pneumocystic carinii.
E) Mycobacterium tuberculosis.
Answer: D
Diff: 1
Learning Outcome: 15.3
Skill Level: 3 Critical Thinking & Clinical Applications

37) Pulmonary ventilation refers to
A) the movement of air into and out of the lungs.
B) the movement of dissolved gases from the alveoli to the blood.
C) the movement of dissolved gases from the blood to the interstitial space.
D) the movement of dissolved gases from the interstitial space to the cells.
E) the utilization of oxygen.
Answer: A
Diff: 1
Learning Outcome: 15.4
Skill Level: 1 Reviewing Facts and Terms

38) The process by which dissolved gases are exchanged between the blood and lungs is
A) pulmonary ventilation.
B) external respiration.
C) internal respiration.
D) cellular respiration.
E) breathing.
Answer: B
Diff: 1
Learning Outcome: 15.4
Skill Level: 1 Reviewing Facts and Terms
39) Internal respiration involves the
A) movement of air into and out of the lungs.
B) diffusion of gases between the cells and the circulating blood.
C) exchange of dissolved gases between the blood and the interstitial fluid.
D) binding of oxygen by hemoglobin.
E) utilization of oxygen by tissues to support metabolism.
Answer: B
Diff: 1
Learning Outcome: 15.4
Skill Level: 1 Reviewing Facts and Terms

40) The force that causes air to move into the lungs during inspiration is supplied by
A) the diaphragm.
B) the abdominal muscles.
C) external intercostal muscles.
D) atmospheric pressure.
E) scalene muscles.
Answer: D
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

41) The force responsible for normal expiration is supplied by the
A) diaphragm.
B) external intercostal muscles.
C) elastic recoil of lung tissue and the thoracic cage.
D) alveoli.
E) smooth muscles in the airways.
Answer: C
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

42) The amount of air that enters and leaves the lungs in a normal respiratory cycle is the
A) total lung capacity.
B) vital capacity.
C) tidal volume.
D) residual volume.
E) inspiratory volume.
Answer: C
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms
43) Gas volume is
A) directly proportional to pressure.
B) directly proportional to temperature.
C) indirectly proportional to pressure.
D) indirectly proportional to temperature.
E) B and C only
Answer: E
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

44) Which of the following is true because of the dead air space in the passageways?
A) The carbon dioxide level in the lungs is always higher than that in the atmosphere.
B) Air exchange is more complete.
C) The carbon dioxide level in the lungs is always lower than that in the atmosphere.
D) The lungs receive a complete exchange with fresh air every cycle.
E) all of the above
Answer: A
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

45) Air moves out of the lungs because
A) the gas pressure in the lungs is less than the outside pressure.
B) the volume of the lungs decreases with expiration.
C) contraction of the diaphragm increases the volume of the pleural cavity.
D) A and C only
E) all of the above
Answer: B
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

46) Forced expiratory movements are produced by contraction of the
A) scalenes.
B) diaphragm.
C) abdominal muscles.
D) external intercostals.
E) serratus anterior.
Answer: C
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms
47) Alveolar ventilation refers to the
A) movement of air into and out of the lungs.
B) movement of air into and out of the alveoli.
C) movement of dissolved gases from the alveoli to the blood.
D) movement of dissolved gases from the blood to the alveoli.
E) utilization of oxygen by alveolar cells to support metabolism.
Answer: B
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

48) Which of the following has the highest value?
A) vital capacity
B) tidal volume
C) inspiratory reserve volume
D) inspiratory capacity
E) expiratory reserve volume
Answer: A
Diff: 1
Learning Outcome: 15.5
Skill Level: 1 Reviewing Facts and Terms

49) In quiet breathing,
A) inspiration and expiration involve muscular contractions.
B) inspiration is passive and expiration involves muscular contractions.
C) inspiration involves muscular contractions and expiration is passive.
D) inspiration and expiration are both passive processes.
E) none of the above
Answer: C
Diff: 1
Learning Outcome: 15.5
Skill Level: 2 Reviewing Concepts

50) If a student inhales as deeply as possible and then blows the air out until he or she cannot exhale any more, the amount of air expelled would be his or her
A) tidal volume.
B) inspiratory reserve volume.
C) expiratory reserve volume.
D) minimal volume.
E) vital capacity.
Answer: E
Diff: 1
Learning Outcome: 15.5
Skill Level: 2 Reviewing Concepts
51) One measure of pulmonary function can be determined by a spirometer. This instrument measures
   A) vital capacity.
   B) maximum rate of air movement.
   C) expiratory reserve.
   D) inspiratory reserve.
   E) A, C, and D
Answer:  E
Diff:  1
Learning Outcome:  15.5
Skill Level:  1 Reviewing Facts and Terms

52) A device called a pneumotachometer measures
   A) the rate of air movement.
   B) the maximum rate of forced expiration.
   C) expiratory reserve volume.
   D) inspiratory reserve volume.
   E) vital capacity.
Answer:  A
Diff:  1
Learning Outcome:  15.5
Skill Level:  3 Critical Thinking & Clinical Applications

53) Carbon dioxide is more soluble in water than oxygen. To get the same amount of oxygen to
dissolve in plasma as carbon dioxide, you would have to
   A) increase the temperature of the plasma.
   B) increase the partial pressure of oxygen.
   C) decrease the partial pressure of oxygen.
   D) increase the rate of plasma flow through the lungs.
   E) decrease the alveolar ventilation rate.
Answer:  B
Diff:  1
Learning Outcome:  15.6
Skill Level:  1 Reviewing Facts and Terms

54) Which of the following is lower?
   A) the partial pressure of carbon dioxide in the alveoli
   B) the partial pressure of carbon dioxide in air
Answer:  B
Diff:  1
Learning Outcome:  15.6
Skill Level:  1 Reviewing Facts and Terms
55) Which of the following is greater?
A) the partial pressure of oxygen in the arteries
B) the partial pressure of oxygen in the veins
Answer: A
Diff: 1
Learning Outcome: 15.6
Skill Level: 1 Reviewing Facts and Terms

56) Katrina lives in St. Louis, which is close to sea level. She decides to spend a month of her summer vacation working in the mountains outside of Denver. After a week in the mountains, what kinds of changes would you expect to see as Katrina adapts to the higher altitude?
A) decreased hematocrit
B) decreased blood pressure
C) decreased alveolar ventilation rate
D) decreased PO2 in the alveoli
E) all of the above
Answer: D
Diff: 1
Learning Outcome: 15.6
Skill Level: 3 Critical Thinking & Clinical Applications

57) Decompression sickness is a painful condition that results in ________ gas coming out of solution in the bloodstream.
A) oxygen
B) hydrogen
C) nitrogen
D) A and B only
E) all of the above
Answer: C
Diff: 1
Learning Outcome: 15.6
Skill Level: 3 Critical Thinking & Clinical Applications

58) Most of the carbon dioxide transported by the blood is
A) dissolved in plasma.
B) bound to hemoglobin.
C) in ionic form as solute (bicarbonate) in the plasma.
D) bound to the same protein as carbon dioxide.
E) carried by white blood cells.
Answer: C
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms
59) The amount of oxygen released from oxyhemoglobin increases when
A) carbon dioxide increases.
B) carbon dioxide decreases.
C) bicarbonate ions increase.
D) temperature increases.
E) carbonic acid decreases.
Answer: A
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms

60) The enzyme carbonic anhydrase causes
A) carbon dioxide to react with water.
B) carbon dioxide to react with bicarbonate ions.
C) water to react with bicarbonate ions.
D) water to react with hydrogen ions.
E) none of the above
Answer: A
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms

61) Which of the following factors would increase the amount of oxygen discharged by hemoglobin to peripheral tissues?
A) decreased temperature
B) decreased pH
C) increased tissue PO2
D) none of the above
E) all of the above
Answer: B
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms

62) Which of the following would be lower?
A) the percent of oxygen saturation of hemoglobin when the body temperature is 100.5°F.
B) the percent of oxygen saturation of hemoglobin when the body temperature is 97.4°F.
Answer: A
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms
63) In emphysema, the alveoli break down and coalesce into large air spaces. The lungs also lose elasticity and compliance is increased. You would expect a person who suffers from emphysema to have
A) increased dead air space.
B) decreased vital capacity.
C) elevated $\text{PCO}_2$ in the blood.
D) increased anteroposterior diameter of the thorax.
E) all of the above
Answer: E
Diff: 1
Learning Outcome: 15.7
Skill Level: 3 Critical Thinking & Clinical Applications

64) A chronic, progressive condition characterized by shortness of breath and destruction of alveolar surfaces and inadequate surface area for gaseous exchange is termed
A) cystic fibrosis.
B) emphysema.
C) asthma.
D) pneumonia.
E) none of the above
Answer: B
Diff: 1
Learning Outcome: 15.7
Skill Level: 3 Critical Thinking & Clinical Applications

65) Chemoreceptors in the carotid and aortic bodies are uniquely sensitive to changes in blood
A) oxygen concentration.
B) carbon dioxide concentration.
C) pH.
D) bicarbonate concentration.
E) volume.
Answer: A
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms

66) Central chemoreceptors are sensitive to blood
A) oxygen concentration.
B) pH.
C) carbon dioxide concentration.
D) bicarbonate concentration.
E) both B and C
Answer: E
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms

67) The most important chemical regulator of respiration is
A) oxygen.
B) carbon dioxide.
C) bicarbonate ion.
D) sodium ion.
E) hemoglobin.
Answer: B
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms

68) A 10 percent increase in the level of carbon dioxide in the blood will
A) decrease the rate of breathing.
B) increase the rate of breathing.
C) decrease pulmonary ventilation.
D) decrease the alveolar ventilation rate.
E) decrease the vital capacity.
Answer: B
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms

69) The normal rate and depth of breathing is established in centers located in the
A) midbrain.
B) cerebellum.
C) cerebrum.
D) spinal cord.
E) medulla oblongata.
Answer: E
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms

70) Together, the inflation and deflation reflexes are known as the _________ reflexes.
A) red herring
B) Hering-Breuer
C) Breuer-Shipley
D) baroreceptor
E) inside angle
Answer: B
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms
71) The term ________ refers to an increase in the PCO2 of arterial blood.
A) hyperventilation
B) hypoventilation
C) hypocapnia
D) hypercapnia
E) hypoglycemia
Answer: D
Diff: 1
Learning Outcome: 15.8
Skill Level: 1 Reviewing Facts and Terms

72) Hyperventilation may cause a(n)
A) decrease in blood carbon dioxide concentration and a drop in pH.
B) decrease in blood carbon dioxide concentration and an increase in pH.
C) increase in blood carbon dioxide concentration and an increase in pH.
D) increase in blood carbon dioxide concentration and an decrease in pH.
E) none of the above
Answer: B
Diff: 1
Learning Outcome: 15.8
Skill Level: 2 Reviewing Concepts

Matching Questions

1) Match the term in the first column with its description in the second column.
   _____ 1. sinus  A. tidal volume, expiratory reserve volume, and inspiratory reserve volume
   _____ 2. surfactant  B. serous membrane
   _____ 3. pleura  C. reduces the surface tension in the lungs
   _____ 4. vital capacity  D. hollow chamber
   _____ 5. inflation reflex  E. prevents overexpansion of lungs during forced breathing
Answer: 1-D, 2-C, 3-B, 4-A, 5-E
Diff: 1
Learning Outcome: 15.10
Skill Level: 1 Reviewing Facts and Terms
Fill in the Blank Questions

1) The lungs are divided into ________________________ that are separated by deep fissures.
   Answer: lobes
   Diff: 1
   Learning Outcome: 15.3
   Skill Level: 1 Reviewing Facts and Terms

2) The layer of serous membrane that is firmly attached to the surface of the lung is known as
   ____________________________.
   Answer: visceral pleura
   Diff: 1
   Learning Outcome: 15.3
   Skill Level: 1 Reviewing Facts and Terms

3) The force that holds the layer of the serous membrane surrounding the lungs together is
   ____________________________.
   Answer: surface tension
   Diff: 1
   Learning Outcome: 15.3
   Skill Level: 1 Reviewing Facts and Terms

4) When the inspiratory muscles relax, the rib cage returns to its original position as a result of
   ____________________________.
   Answer: elastic recoil
   Diff: 1
   Learning Outcome: 15.5
   Skill Level: 1 Reviewing Facts and Terms

5) The volume of air moved into or out of the lungs during quiet respiration is known as
   ____________________________.
   Answer: tidal volume
   Diff: 1
   Learning Outcome: 15.5
   Skill Level: 1 Reviewing Facts and Terms

6) The volume of air that can be forcefully inhaled in addition to normal inspiration is called the
   ____________________________.
   Answer: inspiratory reserve volume
   Diff: 1
   Learning Outcome: 15.5
   Skill Level: 1 Reviewing Facts and Terms
7) Dalton's law is based on the amount of pressure each gas in a solution contributes to the total. This law is also called the law of _________________________.
Answer: partial pressure
Diff: 1
Learning Outcome: 15.6
Skill Level: 1 Reviewing Facts and Terms

8) The amount of oxygen released from hemoglobin increases as the local concentration of carbon dioxide _________________________.
Answer: increases
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms

9) The illness characterized by shortness of breath resulting from loss of respiratory membrane surface for gas exchange is _________________________.
Answer: emphysema
Diff: 1
Learning Outcome: 15.7
Skill Level: 1 Reviewing Facts and Terms

10) Respiration is controlled by the medulla oblongata and _________________________.
    Answer: pons
    Diff: 1
    Learning Outcome: 15.8
    Skill Level: 1 Reviewing Facts and Terms

11) The ________________________ of the medulla oblongata sets the pace for inspiration.
    Answer: respiratory rhythmicity center
    Diff: 1
    Learning Outcome: 15.8
    Skill Level: 1 Reviewing Facts and Terms

12) An increased rate of breathing associated with exercise or other increased metabolic need is called _________________________.
    Answer: hyperpnea
    Diff: 1
    Learning Outcome: 15.8
    Skill Level: 1 Reviewing Facts and Terms

13) Chemoreceptors located in the ________________________ bodies and ________________________ bodies are sensitive to changes in PCO2 and PO2.
    Answer: carotid; aortic
    Diff: 1
    Learning Outcome: 15.8
    Skill Level: 1 Reviewing Facts and Terms
Essay Questions

1) During the winter, Brad sleeps in a dorm room that lacks any humidifier for the heated air. In the mornings he notices that his nose is "stuffy" similar to when he has a cold, but after showering and drinking some water, the stuffiness disappears until the next morning. What might be the cause of Brad's nasal condition?

Answer: Since the air that Brad is breathing is not humidified (thus dry), large amounts of moisture are leaving the mucus to humidify the air that is being respired. This makes the mucus tacky and makes it difficult for the cilia to move. As more mucus is produced, it builds up, forming the nasal congestion in the morning. As Brad showers and drinks fluid, the moisture is replaced and the mucus loosens up and is moved along the proper route as usual. The reason this happens mostly at night is because Brad is probably not getting up frequently to drink water to replace what is being lost to humidify the air.

Diff: 1
Learning Outcome: 15.2
Skill Level: 2 Reviewing Concepts

2) A newborn infant is found dead, abandoned by the road. Among the many questions that the police would like to have answered is whether the infant was born dead or alive. After an autopsy, the medical examiner tells them that the infant was dead at birth. How could the medical examiner determine this?

Answer: Unless the infant was suffocated immediately when it was born, the first breath that it took would start to inflate the lungs and some of the air would be trapped in the lungs. By placing the lungs in water to see if they would float or not, the medical examiner can determine whether or not there is any air in the lungs. Other measurements and tests could also be used to determine if the infant had breathed at all (air in the lungs) or was dead at birth (lungs collapsed with a small amount of fluid).

Diff: 2
Learning Outcome: 15.3
Skill Level: 3 Critical Thinking & Clinical Applications
Labeling Exercises

Using the figure above, identify the labeled part.

1) Label A: ________
Answer: Nasal conchae
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms

2) Label B: ________
Answer: Nose
Diff: 1
Learning Outcome: 15.2
Skill Level: 1 Reviewing Facts and Terms
3) Label C: ________
   Answer: Larynx
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

4) Label D: ________
   Answer: Trachea
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

5) Label E: ________
   Answer: Bronchus
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

6) Label F: ________
   Answer: Bronchioles
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

7) Label G: ________
   Answer: Pharynx
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

8) Label H: ________
   Answer: Internal nares
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

9) Label I: ________
   Answer: Nasal cavity
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

10) Label J: ________
    Answer: Vein
       Diff: 1
       Learning Outcome: 15.2
       Skill Level: 1 Reviewing Facts and Terms
11) Label K: ________
   Answer: Artery
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

12) Label L: ________
   Answer: Alveolus
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms

13) Label M: ________
   Answer: Capillary network
   Diff: 1
   Learning Outcome: 15.2
   Skill Level: 1 Reviewing Facts and Terms