Using Figure 13.1, identify the following:

1) The nasal cavity is indicated by the letter __________.
   Answer: A
   Diff: 1 Page Ref: 442

2) The right primary bronchus is indicated by letter __________.
   Answer: H
   Diff: 1 Page Ref: 442

3) The trachea is indicated by letter __________.
   Answer: I
   Diff: 1 Page Ref: 442

4) The diaphragm muscle is indicated by letter __________.
   Answer: G
   Diff: 1 Page Ref: 442

5) The oral cavity is indicated by letter __________.
   Answer: C
   Diff: 1 Page Ref: 442

6) The base of the right lung is indicated by letter __________.
   Answer: F
   Diff: 1 Page Ref: 442
7) The nostrils are indicated by letter __________.
Answer: B
Diff: 1  Page Ref: 442

8) The apex of the right lung is indicated by letter __________.
Answer: E
Diff: 1  Page Ref: 446

9) The larynx is indicated by letter __________.
Answer: D
Diff: 1  Page Ref: 442

10) The pharynx is indicated by letter __________.
    Answer: J
    Diff: 1  Page Ref: 442

Fill in the blank or provide a short answer:

11) The three mucosa-covered projections into the nasal cavity that greatly increase surface area
    of mucosa exposed to air are called __________.
    Answer: conchae
    Diff: 3  Page Ref: 442

12) The anterior portion of the palate that is supported by bone is called the __________.
    Answer: hard palate
    Diff: 1  Page Ref: 442

13) The throat is also known as the __________.
    Answer: pharynx
    Diff: 1  Page Ref: 443

14) Inflammation of the sinuses that can cause marked changes in voice quality is called
    __________.
    Answer: sinusitis
    Diff: 1  Page Ref: 443

15) The large shield-shaped thyroid cartilage that protrudes anteriorly is commonly called the
    __________.
    Answer: Adam's apple
    Diff: 1  Page Ref: 444

16) The mucosa-lined windpipe that extends from the larynx to the level of the fifth thoracic
    vertebra is called the __________.
    Answer: trachea
    Diff: 1  Page Ref: 444

17) The tonsils found in the nasopharynx are called __________ or __________.
    Answer: pharyngeal tonsils; adenoids
    Diff: 2  Page Ref: 444

18) The opening between the vocal folds is called the __________.
    Answer: glottis
    Diff: 1  Page Ref: 444
19) The C-shaped rings that reinforce the trachea are constructed of __________ cartilage.
   Answer: hyaline
   Diff: 2     Page Ref: 444

20) The flap of elastic cartilage that protects the opening of the larynx is called the __________.
    Answer: epiglottis
    Diff: 1     Page Ref: 444

21) A procedure in which air within the lungs is used to forcibly expel an obstructing piece of food to avoid suffocation is called the __________.
    Answer: Heimlich maneuver
    Diff: 1     Page Ref: 444

22) The central area between the two lungs that houses the heart, great blood vessels, bronchi, and esophagus is called the __________.
    Answer: mediastinum
    Diff: 2     Page Ref: 445

23) The smallest conducting passageways of the lungs are called __________.
    Answer: bronchioles
    Diff: 1     Page Ref: 447

24) "Dust cells" that wander in and out of the alveoli, picking up bacteria, carbon particles, and other debris, are actually __________.
    Answer: macrophages
    Diff: 3     Page Ref: 447

25) The air sacs of the lungs are called __________.
    Answer: alveoli
    Diff: 1     Page Ref: 447

26) The process of moving air into and out of the lungs is commonly called breathing or __________.
    Answer: pulmonary ventilation
    Diff: 2     Page Ref: 448

27) Gas exchange between the blood and tissue cells is called __________.
    Answer: internal respiration
    Diff: 2     Page Ref: 449

28) The inspiratory muscles that contract so we can inspire air are the __________ and __________.
    Answer: diaphragm; external intercostals
    Diff: 2     Page Ref: 451

29) The presence of air in the intrapleural space is known as __________.
    Answer: pneumothorax
    Diff: 2     Page Ref: 451-452
30) Normal quiet breathing moves about ________ mL of air into and out of the lungs with each breath.
Answer: 500
Diff: 2    Page Ref: 452

31) A mechanism that clears the upper respiratory passages, which is similar to a cough except that the expelled air is directed through the nasal cavities instead of the oral cavity, is called a __________.
Answer: sneeze
Diff: 1    Page Ref: 452

32) Air that remains in the conducting zone passageways and never reaches the alveoli is called the __________.
Answer: dead space volume
Diff: 3    Page Ref: 453

33) Respiratory capacities are measured with a __________.
Answer: spirometer
Diff: 2    Page Ref: 453

34) An abnormal bubbling sound caused by diseased respiratory tissue, mucus, or pus is called __________.
Answer: crackle
Diff: 2    Page Ref: 453

35) Oxygen bound to hemoglobin molecules on RBCs is called __________.
Answer: oxyhemoglobin
Diff: 1    Page Ref: 454

36) Most carbon dioxide is dissolved in blood plasma and transported as __________.
Answer: bicarbonate ion
Diff: 2    Page Ref: 454

37) Inadequate oxygen delivery to body tissues is called __________.
Answer: hypoxia
Diff: 1    Page Ref: 455

38) During internal respiration, the blood gas __________ is loaded into the bloodstream.
Answer: carbon dioxide
Diff: 2    Page Ref: 455-456

39) A normal respiratory rate of about 12–15 breaths per minute is called __________.
Answer: eupnea
Diff: 3    Page Ref: 456

40) The most important stimulus for breathing in a healthy person is the body’s need to rid itself of the blood gas called __________.
Answer: carbon dioxide
Diff: 3    Page Ref: 457; 460
41) Enlargement of the alveoli and chronic inflammation of the lungs are characteristics of a respiratory disease called __________.
Answer: emphysema
Diff: 3 Page Ref: 461

42) Chronically inflamed, hypersensitive bronchial passages that can be irritated by dust mite and cockroach droppings are indicative of __________.
Answer: asthma
Diff: 2 Page Ref: 464

Multiple Choice

1) The conducting passageways of the respiratory system include all of the following structures EXCEPT:
   A) nose
   B) pharynx
   C) larynx
   D) trachea
   E) alveoli
Answer: E
Diff: 1 Page Ref: 441

2) The respiratory conducting passageways perform all of the following functions EXCEPT:
   A) allow air to reach the lungs
   B) purify air
   C) humidify air
   D) exchange gases
   E) warm incoming air
Answer: D
Diff: 1 Page Ref: 441

3) Which one of the following terms does not apply to the nose:
   A) external nares
   B) nasopharynx
   C) nostrils
   D) nasal cavity
   E) nasal septum
Answer: B
Diff: 1 Page Ref: 441–442

4) What is the role of mucus in the nasal cavity:
   A) increase the air turbulence in the nasal cavity
   B) separate the oral from the nasal cavity
   C) lighten the skull
   D) act as a resonance chamber for speech
   E) trap incoming bacteria and other foreign debris
Answer: E
Diff: 2 Page Ref: 442
5) The nasal cavity is separated from the oral cavity by:
   A) the hard palate
   B) the nasal conchae
   C) the soft palate
   D) both the hard and soft palate
   E) both the nasal conchae and hard palate
Answer: D
Diff: 2    Page Ref: 442

6) Which one of the following bones does NOT contain paranasal sinuses:
   A) frontal
   B) sphenoid
   C) mandible
   D) ethmoid
   E) maxilla
Answer: C
Diff: 2    Page Ref: 442

7) Which one of the following is NOT a function of the paranasal sinuses:
   A) they lighten the skull
   B) they act as resonance chambers for speech
   C) they produce mucus
   D) they are olfactory receptors for smell
   E) they help to moisten air
Answer: D
Diff: 2    Page Ref: 443

8) Air from the nasal cavity enters the superior portion of the pharynx called the:
   A) nasopharynx
   B) oropharynx
   C) palatopharynx
   D) laryngopharynx
   E) tracheopharynx
Answer: A
Diff: 1    Page Ref: 443

9) The pharyngotympanic tubes, which drain the middle ear, open into the:
   A) nasopharynx
   B) oropharynx
   C) palatopharynx
   D) laryngopharynx
   E) tracheopharynx
Answer: A
Diff: 1    Page Ref: 444
10) Tonsils that lie at the base of the tongue are called:
   A) adenoids
   B) pharyngeal tonsils
   C) palatine tonsils
   D) lingual tonsils
   E) pharyngotympanic tonsils
   Answer: D
   Diff: 2  Page Ref: 444

11) Following the removal of the larynx, a person would be unable to:
   A) speak
   B) sneeze
   C) eat
   D) hear
   E) breathe
   Answer: A
   Diff: 3  Page Ref: 444

12) The opening between the vocal cords is called the:
    A) epiglottis
    B) glottis
    C) larynx
    D) thyroid cartilage
    E) esophagus
    Answer: B
    Diff: 2  Page Ref: 444

13) The flap of elastic cartilage that protects food from entering the larynx when swallowing is:
    A) glottis
    B) thyroid cartilage
    C) Adam’s apple
    D) epiglottis
    E) trachea
    Answer: D
    Diff: 2  Page Ref: 444

14) Vibration due to exhaled air that results in speech is a function of the:
    A) complete voice box
    B) true vocal cords
    C) false vocal cords
    D) glottis
    E) epiglottis
    Answer: B
    Diff: 1  Page Ref: 444
15) Cilia of the trachea that beat continually propel contaminated mucus:
   A) toward the throat to be swallowed or spat out
   B) toward the nose to be sneezed out
   C) toward the epiglottis to be coughed out
   D) toward the lungs to be encapsulated
   E) toward the glottis to be hiccupped out
Answer: A
Diff: 2 Page Ref: 444–445

16) The serous membrane covering the surface of the lungs is called the:
   A) mediastinum
   B) visceral pleura
   C) parietal pleura
   D) main (primary) bronchi
   E) pleurisy
Answer: B
Diff: 2 Page Ref: 447

17) Which one of the following is NOT true of the lungs:
   A) the narrower portion of each lung is called the apex
   B) the bases rest on the diaphragm
   C) the left lung has two lobes
   D) the right lung has three lobes
   E) both lungs have two lobes
Answer: E
Diff: 1 Page Ref: 445; 447

18) When oxygen enters the respiratory system, what is the next structure to which it travels immediately upon leaving the trachea:
   A) bronchioles
   B) alveoli
   C) pleura
   D) main (primary) bronchi
   E) tertiary bronchi
Answer: D
Diff: 3 Page Ref: 445

19) Which one of the following structures is NOT part of the respiratory zone:
   A) respiratory bronchioles
   B) alveolar ducts
   C) alveolar sacs
   D) alveoli
   E) primary bronchi
Answer: E
Diff: 2 Page Ref: 447
20) The walls of the alveoli are composed largely of:
   A) simple squamous epithelium
   B) stratified squamous epithelium
   C) simple cuboidal epithelium
   D) stratified cuboidal epithelium
   E) pseudostratified epithelium
Answer: A
Diff: 1   Page Ref: 447

21) Exchange of both oxygen and carbon dioxide through the respiratory membrane occurs by:
   A) osmosis
   B) simple diffusion
   C) facilitated diffusion
   D) active transport
   E) passive transport
Answer: B
Diff: 1   Page Ref: 447

22) The lipid molecule critical to lung function that coats the gas-exposed alveolar surfaces is called:
   A) surfactant
   B) interferon
   C) kinin
   D) renin
   E) lecithin
Answer: A
Diff: 2   Page Ref: 447

23) Air moving in and out of the lungs is called:
   A) internal respiration
   B) inspiration
   C) external respiration
   D) expiration
   E) pulmonary ventilation
Answer: E
Diff: 1   Page Ref: 448

24) Which one of the following is NOT true of inspiration:
   A) contraction of the diaphragm muscle helps increase the size of the thoracic cavity
   B) relaxation of the external intercostal muscles helps increase the size of the thoracic cavity
   C) increased intrapulmonary volume causes inhaled gases to spread out
   D) the decreased gas pressure produces a partial vacuum that forcibly sucks air in
   E) air continues to move into the lungs until intrapulmonary pressure equals atmospheric pressure
Answer: B
Diff: 3   Page Ref: 451
25) The gas exchange that occurs between blood and tissue cells at systemic capillaries is called:
   A) pulmonary ventilation
   B) expiration
   C) internal respiration
   D) external respiration
   E) respiratory gas transport
   Answer: C
   Diff: 2    Page Ref: 449

26) In order to inspire:
   A) gas pressure in the lungs must increase
   B) the intrapulmonary volume must increase
   C) the diaphragm relaxes
   D) the intrapulmonary volume must decrease
   E) the external intercostal muscles relax
   Answer: B
   Diff: 2    Page Ref: 451

27) An emotionally-induced response during which air movement is similar to crying is:
   A) coughing
   B) sneezing
   C) laughing
   D) hiccupping
   E) yawning
   Answer: C
   Diff: 1    Page Ref: 452

28) A very deep inspiration that ventilates all alveoli is:
   A) coughing
   B) sneezing
   C) crying
   D) hiccupping
   E) yawning
   Answer: E
   Diff: 1    Page Ref: 452

29) The respiratory movement representing the total amount of exchangeable air is the:
   A) tidal volume
   B) inspiratory reserve volume
   C) expiratory reserve volume
   D) vital capacity
   E) dead space volume
   Answer: D
   Diff: 2    Page Ref: 452
30) The amount of air that can be forcibly exhaled after a tidal expiration is about:
   A) 500 mL
   B) 1200 mL
   C) 2100 mL
   D) 4800 mL
   E) 6000 mL
   Answer: B
   Diff: 2     Page Ref: 452

31) The amount of air exchanged during normal quiet breathing is about:
   A) 500 mL
   B) 1200 mL
   C) 2100 mL
   D) 4800 mL
   E) 6000 mL
   Answer: A
   Diff: 2     Page Ref: 452

32) Most carbon dioxide is transported within blood plasma as:
   A) carbohemoglobin
   B) bicarbonate ion
   C) oxyhemoglobin
   D) hydrogen ion
   E) carbonic acid
   Answer: B
   Diff: 3     Page Ref: 454

33) Oxygen binds with hemoglobin in the blood to form:
   A) bicarbonate ion
   B) oxyhemoglobin
   C) carbonic acid
   D) carbon dioxide
   E) plasma
   Answer: B
   Diff: 1     Page Ref: 454

34) The bluish cast that results from inadequate oxygenation of the skin and mucosa is called:
   A) cyanosis
   B) xanthosis
   C) melanosis
   D) albinism
   E) erythema
   Answer: A
   Diff: 1     Page Ref: 455
35) Which one of the following is NOT a factor influencing respiratory rate and depth:
   A) physical exercise
   B) volition
   C) emotional factors
   D) enzymatic factors
   E) levels of oxygen and carbon dioxide
   Answer: D
   Diff: 1       Page Ref: 456–457

36) Cessation of breathing is called:
   A) apnea
   B) dyspnea
   C) eupnea
   D) hyperpnea
   E) tachypnea
   Answer: A
   Diff: 1       Page Ref: 460

37) Hypoventilation dramatically increases carbonic acid concentration and involves:
   A) extremely deep breathing
   B) extremely fast breathing
   C) extremely slow breathing
   D) intermittent breathing
   E) irregular breathing
   Answer: C
   Diff: 1       Page Ref: 460

38) Hyperventilation leads to all of the following EXCEPT:
   A) brief periods of apnea
   B) cyanosis
   C) dizziness
   D) fainting
   E) buildup of carbon dioxide in the blood
   Answer: E
   Diff: 2       Page Ref: 460

39) The most important chemical stimuli leading to increased rate and depth of breathing is:
   A) decreased oxygen level in the blood
   B) increased blood pH
   C) increased carbon dioxide in the blood
   D) increased hydrogen ion in the blood
   E) decreased carbon dioxide in the blood
   Answer: C
   Diff: 2       Page Ref: 457; 460
40) Which one of the following is NOT a feature of COPD:
   A) most patients have a genetic predisposition to COPD
   B) dyspnea becomes progressively more severe
   C) frequent pulmonary infections are common
   D) most COPD victims are hypoxic
   E) most patients have a history of smoking
   Answer: A
   Diff: 2 Page Ref: 460–461

41) Emphysema results in all of the following EXCEPT:
   A) enlarged alveoli
   B) lung fibrosis
   C) expanded barrel chest
   D) decreased lung elasticity
   E) moon face
   Answer: E
   Diff: 2 Page Ref: 461

42) The molecule that prevents lung collapse by lowering the surface tension of the water film lining each alveolar sac is called:
   A) resorbin
   B) renin
   C) lecithin
   D) surfactant
   E) fibrosin
   Answer: D
   Diff: 2 Page Ref: 461

43) Surfactant is usually present in fetal lungs in adequate quantities by:
   A) 20–22 weeks of pregnancy
   B) 22–24 weeks of pregnancy
   C) 24–26 weeks of pregnancy
   D) 26–28 weeks of pregnancy
   E) 28–30 weeks of pregnancy
   Answer: E
   Diff: 2 Page Ref: 461

44) The abbreviation IRDS stands for:
   A) infant respiratory disease state
   B) intermittent respiratory distress state
   C) infant respiratory distress syndrome
   D) intermittent respiratory disease syndrome
   E) infant respiratory disease syndrome
   Answer: C
   Diff: 2 Page Ref: 461
45) Which one of the following is NOT true of cystic fibrosis:
   A) it is the most common lethal genetic disease in the U.S.
   B) it causes oversecretion of thick mucus that clogs the respiratory passages
   C) it impairs food digestion
   D) it causes sweat glands to produce an extremely salty perspiration
   E) it is rarely fatal
Answer: E
Diff: 2     Page Ref: 461; 464

46) The respiratory rate in adults is:
   A) 5–10 respirations per minute
   B) 12–18 respirations per minute
   C) 20–25 respirations per minute
   D) 30 respirations per minute
   E) over 40 respirations per minute
Answer: B
Diff: 2     Page Ref: 464

47) The homeostatic imbalance associated with the death of many full-term newborn infants is called:
   A) CF
   B) SIDS
   C) CTRL
   D) COPD
   E) IRDS
Answer: B
Diff: 1     Page Ref: 464

48) Obstruction of the trachea by a piece of food can lead to:
   A) hemothorax
   B) pleurisy
   C) aspiration pneumonia
   D) pneumothorax
   E) pulmonary tamponade
Answer: C
Diff: 2     Page Ref: 464

49) Which of the following are currently the most damaging and disabling respiratory diseases in the U.S.:
   A) tuberculosis and COPD
   B) COPD and lung cancer
   C) lung cancer and asthma
   D) asthma and tuberculosis
   E) tuberculosis and pneumonia
Answer: B
Diff: 2     Page Ref: 464
50) Which one of the following is NOT true of lung cancer:
   A) it accounts for one-third of all cancer deaths in the U.S.
   B) its incidence is currently increasing
   C) it is generally more prevalent in males than females
   D) most types of lung cancer are very aggressive
   E) lung cancers often metastasize rapidly and widely
Answer: C
Diff: 2   Page Ref: 458–459

True/False

1) The ciliated cells of the nasal mucosa propel contaminated mucus posteriorly toward the pharynx.
   Answer: TRUE
   Diff: 1   Page Ref: 442

2) The nasal cavity is separated from the oral cavity by the nasal conchae.
   Answer: FALSE
   Diff: 1   Page Ref: 442

3) There are only three paranasal sinuses located in the frontal, sphenoid, and parietal bones.
   Answer: FALSE
   Diff: 2   Page Ref: 442

4) Inflammation of the nasal mucosa by cold viruses and various antigens is called rhinitis.
   Answer: TRUE
   Diff: 1   Page Ref: 443

5) The larynx serves as a passageway for both food and air.
   Answer: FALSE
   Diff: 1   Page Ref: 443

6) The larynx routes air and food into their proper channel and plays an important role in speech production.
   Answer: TRUE
   Diff: 1   Page Ref: 444

7) The "guardian of the airways" that prevents food from entering the superior opening of the larynx is the thyroid cartilage.
   Answer: FALSE
   Diff: 2   Page Ref: 444

8) The pharyngeal tonsils are also known as the adenoids.
   Answer: TRUE
   Diff: 1   Page Ref: 444

9) The emergency surgical opening of the trachea is called a tracheostomy.
   Answer: TRUE
   Diff: 1   Page Ref: 444
10) The C-shaped rings of cartilage that reinforce the trachea are made of elastic cartilage.
   Answer: FALSE
   Diff: 3   Page Ref: 444

11) The superior portion of the lung is called the base.
   Answer: FALSE
   Diff: 2   Page Ref: 445; 447

12) The bronchioles are the smallest of the conducting passageways in the lungs.
   Answer: TRUE
   Diff: 1   Page Ref: 447

13) Inflammation of the pleura is often caused by decreased secretion of pleural fluid called pleurisy.
   Answer: TRUE
   Diff: 1   Page Ref: 447

14) The respiratory membrane is the air-blood barrier, where gases are exchanged.
   Answer: TRUE
   Diff: 2   Page Ref: 447

15) The respiratory zone includes the respiratory bronchioles, alveolar ducts, alveolar sacs, and alveoli.
   Answer: TRUE
   Diff: 2   Page Ref: 447

16) The process of breathing is known as pulmonary ventilation.
   Answer: TRUE
   Diff: 2   Page Ref: 448

17) Inspiration results when the diaphragm and external intercostal muscles relax.
   Answer: FALSE
   Diff: 3   Page Ref: 451

18) Expiration occurs when the thoracic and intrapulmonary volumes decrease and the intrapulmonary pressure increases.
   Answer: TRUE
   Diff: 3   Page Ref: 451

19) The amount of air that can be forcibly inhaled over the tidal volume is about 2100 to 3200 mL.
   Answer: TRUE
   Diff: 2   Page Ref: 452

20) The total amount of exchangeable air in a healthy young male is typically around 4800 mL.
   Answer: TRUE
   Diff: 2   Page Ref: 452

21) Sudden inspirations resulting from spasms of the diaphragm are hiccups.
   Answer: TRUE
   Diff: 1   Page Ref: 452
22) The amount of air that can be forcibly exhaled after a normal tidal expiration is the residual volume.
Answer: FALSE
Diff: 3 Page Ref: 452

23) Wheezing is a whistling sound associated with diseased respiratory tissue, mucus, or pus.
Answer: TRUE
Diff: 1 Page Ref: 453

24) According to the laws of diffusion, movement of a respiratory gas occurs toward the area of higher concentration of that particular respiratory gas.
Answer: FALSE
Diff: 1 Page Ref: 454

25) The general term for inadequate oxygen delivery to body tissues regardless of the cause is called hypoxia.
Answer: TRUE
Diff: 1 Page Ref: 455

26) Venous blood in systemic circulation is poorer in oxygen and richer in carbon dioxide.
Answer: TRUE
Diff: 2 Page Ref: 456

27) Inspiration by the diaphragm muscle is regulated by the phrenic nerves.
Answer: TRUE
Diff: 2 Page Ref: 456

28) The lungs of the fetus are filled with air late in pregnancy.
Answer: FALSE
Diff: 1 Page Ref: 461

29) The faulty gene associated with cystic fibrosis codes for the CFTR protein, which controls the flow of chloride in and out of cells.
Answer: TRUE
Diff: 2 Page Ref: 461; 464
Matching

Match the following structure with its description:

1) Throat
   Diff: 1    Page Ref: 443
   A) alveoli
   B) larynx

2) Windpipe
   Diff: 1    Page Ref: 444
   C) trachea

3) Voice box
   Diff: 1    Page Ref: 444
   D) glottis
   E) esophagus

4) Opening to the larynx
   Diff: 2    Page Ref: 444
   F) bronchioles

5) The trachea branches into these tubes
   Diff: 2    Page Ref: 445
   G) main (primary) bronchi
   H) pharynx

6) Tube posterior to the trachea
   Diff: 1    Page Ref: 444

7) Smallest conducting passageways in the lungs
   Diff: 1    Page Ref: 447

8) Air sacs within the lungs
   Diff: 1    Page Ref: 447

1) H  2) C  3) B  4) D  5) G  6) E
7) F  8) A
Match the following mechanism with its associated nonrespiratory movement:

9) Involves using the uvula to close the oral cavity off from the pharynx in order to clear the upper respiratory passages
   A) yawning
   
   B) laughing
   
   C) coughing
   
   D) throat-clearing
   
   
   Diff: 2    Page Ref: 452

10) An emotionally induced response that produces air movements similar to crying
    E) hiccupping
    
    F) sneezing
    
    
    11) A very deep inspiration formerly believed to be triggered by low oxygen
        G) crying
        
        
        Diff: 2    Page Ref: 452

12) Primarily an emotionally induced mechanism that involves release of air in a number of short breaths, similar to laughing
    H) laughing
    
    
    Diff: 2    Page Ref: 452

13) Blast of upward rushing air that clears the lower respiratory passageways
    I) sneezing
    
    
    Diff: 2    Page Ref: 452

14) Sudden inspirations resulting from spasms of the diaphragm
    J) coughing
    
    
    Diff: 2    Page Ref: 452

Match the following definitions with their associated respiratory volume or capacity:

15) Amount of air that can be forcibly exhaled after a normal tidal expiration
   A) conducting zone volume
   B) total lung capacity
   C) dead space volume

16) Normal, quiet breathing which moves approximately 500 mL of air per breath
   D) tidal volume
   E) expiratory reserve volume

17) Air that enters the respiratory tract and remains within the conducting zone passageways
   F) vital capacity
   G) residual volume
   H) inspiratory reserve volume

18) Amount of air that can be inhaled forcibly over the tidal volume
   I) conductive zone volume

19) Total amount of exchangeable air
   J) conductive zone volume

20) Air that remains in the lungs even after the most strenuous expiration
   K) total lung capacity

21) Sum total of tidal volume, inspiratory reserve volume, and expiratory reserve volume
   L) total lung capacity

Essay

1) Explain the roles of mucus and cilia in the respiratory system.
Answer: Respiratory mucosa lines the nasal cavity which produces sticky mucus. This mucus moistens the air and traps incoming bacteria and other foreign debris entering the nasal cavity. The ciliated cells of the nasal mucosa move this contaminated mucus posteriorly toward the pharynx where it can be swallowed. The trachea is also lined with ciliated mucosa. These cilia move contaminated mucus toward the throat where it either can be swallowed or spat out.

Diff: 2 Page Ref: 442; 444–445

2) List the three regions of the pharynx and identify their relative superior and inferior endpoints in the respiratory passageway.
Answer: The three portions of the pharynx are the nasopharynx, the oropharynx, and the laryngopharynx. The nasopharynx is the superior portion that extends from the nasal cavity to the soft palate. The oropharynx is the central portion that lies between the soft palate and the upper epiglottis. The laryngopharynx is the most inferior portion and is the connecting point to the larynx below.

Diff: 2 Page Ref: 443–444

3) Explain the role of the epiglottis in the respiratory system.
Answer: The epiglottis is a part of the larynx. This structure is made of elastic cartilage. The epiglottis protects the superior opening (glottis) of the trachea. When we swallow foods or fluids, the larynx is pulled upward and the epiglottis tips to form a lid over the opening of the larynx. Food and fluids are then forced into the posterior tube called the esophagus.

Diff: 2 Page Ref: 444

4) Identify the two pleural membranes and describe them under normal and disease conditions.
Answer: The pleural membranes, the visceral pleura and the parietal pleura, produce a slippery serous secretion that allows the lungs to glide easily over the thorax wall during breathing. This serous fluid causes the two pleural layers to cling together. They can slide easily from side to side across one another, but they cannot easily be pulled apart. As surface tension of water holds them tightly to each other, the lungs are held tightly to the thorax wall. The pleural space is more of a potential space than an actual space, and it is only during illness or injury that this space becomes apparent, such as with a pneumothorax that can lead to atelectasis.

Diff: 2 Page Ref: 447

5) Explain the structure and function of the respiratory membrane.
Answer: The respiratory membrane, also known as the air-blood barrier, is comprised of the fused basement membranes of the alveolar and capillary walls. It has gas flowing past on one side and blood flowing past on the other. Gas exchanges occur by simple diffusion through the respiratory membrane. Oxygen passes from the alveolar air into the capillary blood and carbon dioxide leaves the blood to enter the gas-filled alveoli.

Diff: 3 Page Ref: 447
6) Identify and describe the four distinct events that are collectively called respiration.

Answer: Pulmonary ventilation is commonly called breathing and involves the movement of air into and out of the lungs. External respiration is the exchange of gases between the pulmonary blood and the alveoli. Respiratory gas transport is the transport of oxygen and carbon dioxide to and from the lungs and tissue cells of the body via the bloodstream. Internal respiration is the exchange of gases between the blood and tissue cells.

Diff: 3  Page Ref: 448–449

7) Describe how oxygen and carbon dioxide are transported in the blood.

Answer: Oxygen is transported in two ways:

1. Most oxygen attaches to hemoglobin molecules on the RBCs to form oxyhemoglobin.
2. A small amount of oxygen dissolves in the plasma for transport.

Carbon dioxide is also transported in two ways:

1. Most carbon dioxide dissolves in the plasma as the bicarbonate ion.
2. A small amount of carbon dioxide is carried inside the RBCs bound to hemoglobin (bound to a different site from oxygen).

Diff: 3  Page Ref: 454–455

8) Describe some of the major and minor effects of smoking on the human body.

Answer: Answers will vary depending on what effects were discussed in class, since smoking has numerous effects on the body. Respiratory effects include airway obstruction, dyspnea, coughing, frequent infections, breakdown of elastin in the connective tissue in the lungs, continual bronchial irritation and inflammation, hypoxia, respiratory acidosis, and respiratory failure. Other effects include clubbing of the fingers due to hypoxia, impotence, and impairment of the immune system.

Diff: 2  Page Ref: 458–460