WELCOME THIRD YEAR CLASS

1. **What is the primary function of the conducting portion of the respiratory system?**
   - A) Gas exchange
   - B) Conduct, filter, warm, and moisten air
   - C) Produce surfactant
   - D) Contain chemoreceptors for smell
   Answer: B) Conduct, filter, warm, and moisten air
2. **Which type of epithelium is found at the nostrils and the true vocal cords?**
   - A) Respiratory epithelium
   - B) Olfactory epithelium
   - C) Non-keratinized stratified squamous epithelium
   - D) Alveolar epithelium
   Answer: C) Non-keratinized stratified squamous epithelium
3. **Where is respiratory epithelium primarily located?**
   - A) Alveoli
   - B) Superior conchae
   - C) Most of the conducting portion of the respiratory tract
   - D) Lingual surface of the epiglottis
   Answer: C) Most of the conducting portion of the respiratory tract
4. **What is the role of alveolar epithelium?**
   - A) Conduct air
   - B) Filter and warm air
   - C) Gas exchange
   - D) Secretion of mucus
   Answer: C) Gas exchange
5. **Which epithelium contains chemoreceptors for smell sensation?**
   - A) Respiratory epithelium
   - B) Non-keratinized stratified squamous epithelium
   - C) Alveolar epithelium
   - D) Olfactory epithelium
   Answer: D) Olfactory epithelium
6. **What is a function of surfactant secreted in the respiratory portion?**
   - A) To filter incoming air
   - B) To facilitate gas exchange
   - C) To reduce surface tension in alveoli
   - D) To warm the air
   Answer: C) To reduce surface tension in alveoli
1. **Which of the following is NOT a part of the conducting portion of the respiratory system?**
   - A) Nasal cavities
   - B) Alveoli
   - C) Trachea
   - D) Bronchioles
   Answer: B) Alveoli
2. **What is the primary function of cartilage in the conducting portion of the respiratory system?**

- A) To facilitate gas exchange
- B) To prevent collapse and maintain an open lumen
- C) To provide sensory functions
- D) To produce surfactant

Answer: B) To prevent collapse and maintain an open lumen

3. **Which structure follows the trachea in the conducting portion of the respiratory system?
- A) Nasopharynx
- B) Larynx
- C) Primary bronchi
- D) Terminal bronchioles

Answer: C) Primary bronchi

4. **What role do elastic fibers and smooth muscle fibers play in the conducting portion?**
- A) They filter air
- B) They provide rigidity
- C) They allow for flexibility and accommodation of expansion and contraction
- D) They secrete mucus

Answer: C) They allow for flexibility and accommodation of expansion and contraction

5. **What type of epithelium is primarily found in the conducting portion of the respiratory system?
- A) Stratified squamous epithelium
- B) Simple cuboidal epithelium
- C) Respiratory epithelium
- D) Columnar epithelium

Answer: C) Respiratory epithelium

6. **Which of the following structures is the last part of the conducting portion before reaching the respiratory portion?**
- A) Bronchi
- B) Terminal bronchioles
- C) Larynx
- D) Nasopharynx

Answer: B) Terminal bronchioles

7. **What is one of the primary functions of the respiratory epithelium in the conducting portion?**
- A) Gas exchange
- B) Secretion of surfactant
- C) Filtering, moisturizing, and warming inspired air
- D) Sensing smell

Answer: C) Filtering, moisturizing, and warming inspired air

1. **Which of the following is NOT a part of the respiratory portion of the respiratory system?
- A) Alveolar ducts
- B) Respiratory bronchioles
- C) Terminal bronchioles
- D) Alveoli

Answer: C) Terminal bronchioles

2. **What is the primary function of the respiratory portion?**
   - A) Filtering and warming air
   - B) Gas exchange between blood and inspired air
   - C) Conducting air to the lungs
   - D) Producing mucus
   Answer: B) Gas exchange between blood and inspired air
3 **What substance is produced in the respiratory portion to reduce surface tension in the alveoli?**
   - A) Mucus
   - B) Surfactant
   - C) Plasma
   - D) Carbon dioxide
   Answer: B) Surfactant
5. **What is the primary gas exchanged in the alveoli?**
   - A) Nitrogen
   - B) Oxygen and carbon dioxide
   - C) Hydrogen
   - D) Argon
   Answer: B) Oxygen and carbon dioxide
1. **What separates the two nasal cavities?**
   - A) Nasal fossa
   - B) Nasal conchae
   - C) Nasal septum
   - D) Vestibule
   Answer: C) Nasal septum
2. **Which part of the nasal cavity is lined with thin skin and transitions to non-keratinized stratified squamous epithelium?**
   - A) Nasal fossa
   - B) Vestibule
   - C) Olfactory epithelium
   - D) Respiratory epithelium
   Answer: B) Vestibule
3. **What is the primary function of the hair in the vestibule of the nasal cavity?**
   - A) To warm the air
   - B) To filter out large dust particles
   - C) To enhance smell
   - D) To produce mucus
   Answer: B) To filter out large dust particles
4. **Which type of epithelium covers the superior conchae?**
   - A) Respiratory epithelium
   - B) Non-keratinized stratified squamous epithelium
   - C) Olfactory epithelium
   - D) Transitional epithelium
   Answer: C) Olfactory epithelium

5. **Which of the following statements is true regarding the conchae?**
   - A) They are located only in the vestibule. Lateral wall of nasal fossae
   - B) They decrease the surface area of the respiratory epithelium.
   - C) They slow the flow of air and increase the surface area for conditioning inspired air.
   - D) They are covered entirely with olfactory epithelium.
   Answer: C) They slow the flow of air and increase the surface area for conditioning inspired air.
6. **What is found beneath the respiratory epithelium in the nasal fossae?**
   - A) Ciliated cells
   - B) Lamina propria rich with superficial venous plexus (swell bodies)
   - C) Mucous glands
   - D) Cartilage
   Answer: B) Lamina propria rich with superficial venous plexus (swell bodies)
7. **What is the primary role of the nasal fossae?**
   - A) To facilitate gas exchange
   - B) To condition the inspired air
   - C) To filter large particles
   - D) To provide structural support
   Answer: B) To condition the inspired air
1. **What are swell bodies?**
   - A) Glands in the nasal mucosa
   - B) Loops of venous plexus in the lamina propria of the respiratory epithelium
   - C) Structures in the olfactory part of the nasal cavity
   - D) Cartilaginous supports of the nasal septum
   Answer: B) Loops of venous plexus in the lamina propria of the respiratory epithelium
2. **What is one of the primary functions of swell bodies?**
   - A) To filter dust particles
   - B) To produce mucus
   - C) To condition and warm inhaled air
   - D) To facilitate gas exchange
   Answer: C) To condition and warm inhaled air
3. **Why do nosebleeds (epistaxis) occur frequently in the nasal cavity?**
   - A) Due to the presence of mucous glands
   - B) Because of the thin walls of the swell bodies and their proximity to the surface
   - C) Due to overproduction of mucus
   - D) Because of inflammation in the olfactory epithelium
   Answer: B) Because of the thin walls of the swell bodies and their proximity to the surface
4. **What is the nasal cycle?**
   - A) A process of gas exchange in the alveoli
   - B) Rhythmic cycles of physiological congestion and decongestion in the nasal mucosa
   - C) The production of mucus in the nasal cavities
   - D) The movement of cilia in the respiratory epithelium
   Answer: B) Rhythmic cycles of physiological congestion and decongestion in the nasal mucosa

5. **How often does the nasal cycle occur?**
   - A) Every 5-10 minutes
   - B) Every 10-15 minutes
   - C) Every 20-30 minutes
   - D) Every hour
   Answer: C) Every 20-30 minutes
6. **What happens during nasal congestion in the nasal cycle?**
   - A) Increased airflow through the nostrils
   - B) Engorgement of swell bodies in one nasal cavity
   - C) Decreased blood flow to the nasal mucosa
   - D) Increased secretion of mucus
   Answer: B) Engorgement of swell bodies in one nasal cavity
7. **What controls the nasal cycle?**
   - A) Hormonal regulation
   - B) Autonomic nervous system
   - C) Respiratory rate
   - D) Environmental factors
   Answer: B) Autonomic nervous system
1. **What is another name for the phenomenon commonly referred to as "brain freeze"?**
   - A) Cold-induced headache
   - B) Sphenopalatine ganglio-neuralgia
   - C) Sinus headache
   - D) Migrainous headache
   Answer: B) Sphenopalatine ganglio-neuralgia
2. **Where do people commonly feel pain when experiencing brain freeze?**
   - A) In the stomach
   - B) In the jaw
   - C) In the head or behind the eyes
   - D) In the neck
   Answer: C) In the head or behind the eyes
3. **What typically triggers the sensation of brain freeze?**
   - A) Eating hot food
   - B) Inhaling cold air
   - C) Consuming cold substances like ice cream
   - D) Drinking carbonated beverages
   Answer: C) Consuming cold substances like ice cream
4. **What physiological response occurs when a cold substance touches the palate?**
   - A) Vasodilation of blood vessels
   - B) Increased heart rate
   - C) Vasoconstriction of blood vessels
   - D) Decreased respiratory rate
   Answer: C) Vasoconstriction of blood vessels
5. **What happens after the initial vasoconstriction in response to the cold?**
   - A) The blood vessels remain constricted
   - B) The blood vessels re-open to restore normal temperature

- C) Blood flow decreases significantly
- D) The surrounding tissues become numb

Answer: B) The blood vessels re-open to restore normal temperature

6. **Why might someone experience a headache after consuming cold food quickly?**
   - A) Due to dehydration
   - B) Because of rapid temperature changes in the palate
   - C) Because of increased blood sugar levels
   - D) Due to food allergies

   Answer: B) Because of rapid temperature changes in the palate

1. **What type of epithelium is found in the respiratory epithelium?**
   - A) Stratified squamous epithelium
   - B) Simple cuboidal epithelium
   - C) Pseudostratified columnar ciliated epithelium
   - D) Transitional epithelium

   Answer: C) Pseudostratified columnar ciliated epithelium

2. **Which type of cells are present in the respiratory epithelium?**
   - A) Keratinocytes
   - B) Goblet cells
   - C) Basal cells
   - D) Squamous cells

   Answer: B) Goblet cells

3. **What type of epithelium is found in the olfactory mucosa?**
   - A) Stratified squamous epithelium
   - B) Simple cuboidal epithelium
   - C) Pseudostratified columnar epithelium with chemoreceptors
   - D) Transitional epithelium

   Answer: C) Pseudostratified columnar epithelium with chemoreceptors

4. **Which of the following is NOT found in the olfactory epithelium?**
   - A) Chemoreceptors
   - B) Goblet cells
   - C) Supporting cells
   - D) Basal cells

   Answer: B) Goblet cells

5. **In the respiratory mucosa, what components are present?**
   - A) Epithelium, lamina propria, nasal glands, blood vessels
   - B) Epithelium, lamina propria, olfactory glands, blood vessels
   - C) Only epithelium and blood vessels
   - D) Only lamina propria and nasal glands

   Answer: A) Epithelium, lamina propria, nasal glands, blood vessels

6. **What type of glands are present in the olfactory mucosa?**
   - A) Mucous and serous glands
   - B) Mucous glands only
   - C) Serous glands only
   - D) No glands present

   Answer: C) Serous glands only

7. **Which structure contributes to the conditioning of inhaled air in the respiratory system?
   - A) Olfactory glands
   - B) Goblet cells in respiratory epithelium
   - C) Chemoreceptors in olfactory epithelium
   - D) Lamina propria
   Answer: B) Goblet cells in respiratory epithelium
2. **Which type of cell in the respiratory epithelium is primarily responsible for mucus secretion?**
   - A) Columnar ciliated cells
   - B) Goblet cells
   - C) Brush cells
   - D) Basal cells
   Answer: B) Goblet cells
3. **What is the primary function of columnar ciliated cells in the respiratory epithelium?**
   - A) Secretion of hormones
   - B) Trapping dust and bacteria
   - C) Sensory information processing
   - D) Movement of mucus via ciliary action
   Answer: D) Movement of mucus via ciliary action
4. **Which cells in the respiratory epithelium have microvilli and are involved in sensory functions?**
   - A) Basal cells
   - B) Granule cells
   - C) Brush cells
   - D) Goblet cells
   Answer: C) Brush cells
5. **What role do basal (stem) cells play in the respiratory epithelium?**
   - A) They secrete mucus.
   - B) They act as sensory receptors.
   - C) They serve as progenitor cells for regeneration.
   - D) They produce hormones.
   Answer: C) They serve as progenitor cells for regeneration.
6. **What do granule cells (NE cells) secrete, and what is their primary function?**
   - A) Mucus; to trap pathogens
   - B) Serotonin and catecholamines; to regulate airway caliber and secretions
   - C) Carbon dioxide; to aid in respiration
   - D) Antibodies; to fight infections
   Answer: B) Serotonin and catecholamines; to regulate airway caliber and secretions
7. **How do granule cells influence the development of the respiratory system?**
   - A) By increasing mucus production
   - B) By exerting a local mitogenic effect to influence the lengthening of airway branches
   - C) By enhancing ciliary movement
   - D) By providing structural support
   Answer: B) By exerting a local mitogenic effect to influence the lengthening of airway branches

8. **In adults, what is a key function of granule cells in relation to respiratory conditions?**
   - A) They improve airflow efficiency.
   - B) They provide local regulation of bronchial or vascular muscle tone in response to hypoxia or hypercapnia.
   - C) They prevent infections in the respiratory tract.
   - D) They increase the production of surfactant.
   Answer: B) They provide local regulation of bronchial or vascular muscle tone in response to hypoxia or hypercapnia.
1. **What is one of the primary roles of serotonin in the respiratory epithelium?**
   - A) To decrease ciliary beat frequency
   - B) To stimulate ciliary beat frequency
   - C) To inhibit mucus secretion
   - D) To promote vasodilation
   Answer: B) To stimulate ciliary beat frequency
2. **How does serotonin increase ciliary beat frequency (CBF)?**
   - A) By increasing blood flow to the epithelium
   - B) By inducing the release of acetylcholine (ACh) from columnar ciliated cells
   - C) By directly stimulating cilia
   - D) By inhibiting mucous secretion
   Answer: B) By inducing the release of acetylcholine (ACh) from columnar ciliated cells
3. **What effect does serotonin have on the pulmonary vasculature?**
   - A) It causes vasodilation
   - B) It induces vasoconstriction
   - C) It has no effect on blood vessels
   - D) It increases blood flow
   Answer: B) It induces vasoconstriction
4. **Through which receptors does serotonin exert its vasoconstrictive effect in pulmonary hypertension?**
   - A) 5HT-1A receptors
   - B) 5HT-1B receptors
   - C) 5HT-2A receptors
   - D) 5HT-3 receptors
   Answer: B) 5HT-1B receptors
5. **What types of glands are found in the lamina propria of the respiratory epithelium?**
   - A) Only mucous glands
   - B) Only serous glands
   - C) Serous and mucous glands
   - D) Endocrine glands only
   Answer: C) Serous and mucous glands
6. **What is the function of serous glands in the respiratory epithelium?**
   - A) To trap inhaled dirt and bacteria
   - B) To facilitate movement of cilia
   - C) To provide structural support
   - D) To produce hormones
   Answer: B) To facilitate movement of cilia

7. **What happens to mucus in cystic fibrosis?**
   - A) It becomes thin and watery
   - B) It remains unchanged
   - C) It becomes dehydrated, thick, and sticky
   - D) It is completely absent
   Answer: C) It becomes dehydrated, thick, and sticky
8. **What are the two layers of the mucous blanket in the respiratory system?**
   - A) Gel layer and solid layer
   - B) Gel layer and sol (peri-ciliary) layer
   - C) Solid layer and liquid layer
   - D) Mucous layer and serous layer
   Answer: B) Gel layer and sol (peri-ciliary) layer
1. **What types of immune cells are found in the lamina propria of the respiratory system?**
   - A) Neutrophils and macrophages
   - B) Mast cells, plasma cells, and lymphoid nodules
   - C) Eosinophils and basophils
   - D) T cells and B cells only
   Answer: B) Mast cells, plasma cells, and lymphoid nodules
2. **What is the role of Immune cells in the respiratory system?**
   - A) To regulate blood flow
   - B) To protect the respiratory system from inhaled microbes
   - C) To produce mucus
   - D) To facilitate gas exchange
   Answer: B) To protect the respiratory system from inhaled microbes
3. **How do blood vessels in the lamina propria contribute to respiratory function?**
   - A) By increasing mucus production
   - B) By warming the inspired air
   - C) By filtering pollutants
   - D) By directly participating in gas exchange
   Answer: B) By warming the inspired air
4. **What mechanism allows blood vessels to warm the inspired air in the respiratory system?**
   - A) Active transport
   - B) Counter-current exchange
   - C) Passive diffusion
   - D) Filtration
   Answer: B) Counter-current exchange
5. **In smokers, what change occurs in the proportion of ciliated cells to goblet cells in the respiratory epithelium?**
   - A) Increased ciliated cells
   - B) Increased goblet cells
   - C) No change
   - D) Decreased goblet cells
   Answer: B) Increased goblet cells
6. **What is the primary purpose of the increased number of goblet cells in smokers?**

- A) To enhance gas exchange
- B) To trap gaseous pollutants
- C) To promote the movement of cilia
- D) To prevent infections

Answer: B) To trap gaseous pollutants

7. **What can explain allergic reactions in the upper respiratory tract?**
- A) Increased ciliary movement
- B) Presence of immune cells in the lamina propria
- C) Decreased blood flow
- D) Mucus production

Answer: B) Presence of immune cells in the lamina propriaHere are some multiple

1. **Where is the olfactory epithelium located?**
- A) In the trachea
- B) Covers the roof of nasal cavities and superior conchae
- C) In the alveoli of the lungs
- D) In the larynx

Answer: B) Covers the roof of nasal cavities and superior conchae

2. **Which type of cells in the olfactory epithelium are responsible for detecting smells?**
- A) Supporting cells
- B) Basal cells
- C) Olfactory neurons
- D) Goblet cells

Answer: C) Olfactory neurons

3. **What is the function of Bowman's glands in the olfactory epithelium?**
- A) To secrete mucus
- B) To produce odoriferous substances
- C) To secrete a constant flow of serous fluid to facilitate the dissolution of odoriferous substances
- D) To provide structural support

Answer: C) To secrete a constant flow of serous fluid to facilitate the dissolution of odoriferous substances

4. **What type of cells provide support in the olfactory epithelium?**
- A) Basal cells
- B) Supporting (sustentacular) cells
- C) Ciliated cells
- D) Goblet cells

Answer: B) Supporting (sustentacular) cells

5. **How often are olfactory neurons renewed?**
- A) Every 10-20 days
- B) Every 30-60 days
- C) Every 90-120 days
- D) Every year

Answer: B) Every 30-60 days

6. **What is a unique feature of the cilia of olfactory neurons?**
- A) They are short and motile.

- B) They are long and non-motile, providing a large surface area for chemoreceptors.
- C) They are absent in adult neurons.
- D) They are covered in mucus.

Answer: B) They are long and non-motile, providing a large surface area for chemoreceptors.

7. **What type of nerve fibers are found in the lamina propria of the olfactory epithelium?**
- A) Trigeminal nerve fibers
- B) Olfactory nerve fibers
- C) Vagus nerve fibers
- D) Facial nerve fibers

Answer: B) Olfactory nerve fibers

8. **What is the primary role of the olfactory epithelium?**
- A) To facilitate gas exchange
- B) To detect and transduce smells
- C) To warm and humidify air
- D) To trap pathogens in mucus

Answer: B) To detect and transduce smells

1. **What shape are supporting cells in the olfactory epithelium?**
- A) Cuboidal
- B) Tall columnar
- C) Squamous
- D) Pyramidal

Answer: B) Tall columnar

2. **What structure is found on the free surface of supporting cells?**
- A) Cilia
- B) Microvilli
- C) Flagella
- D) Stereocilia

Answer: B) Microvilli

3. **What type of junctions bind supporting cells to olfactory neurons?**
- A) Gap junctions
- B) Adherens junctions
- C) Tight junctions
- D) Desmosomes

Answer: C) Tight junctions

4. **What do supporting cells secrete that assists in the function of olfactory neurons?**
- A) Mucus
- B) Odorant-binding proteins
- C) Hormones
- D) Neurotransmitters

Answer: B) Odorant-binding proteins

5. **What role do supporting cells play in the sensation of smell?**
- A) They directly transduce smell signals.
- B) They provide structural support only.
- C) They express abundant ion channels, aiding in signal conduction for smell sensation.

- D) They trap odorant molecules in mucus.

Answer: C) They express abundant ion channels, aiding in signal conduction for smell sensation.

6. **In the context of COVID-19, what condition related to supporting cells has been observed?**
   - A) Enhanced smell
   - B) Loss of smell (anosmia)
   - C) Increased mucus production
   - D) Inflammation of the olfactory bulb

   Answer: B) Loss of smell (anosmia)

7. **What is the function of basal cells in the olfactory epithelium?**
   - A) They secrete odorant-binding proteins.
   - B) They act as stem cells for regenerating olfactory and supporting cells.
   - C) They form tight junctions with olfactory neurons.
   - D) They trap environmental pollutants.

   Answer: B) They act as stem cells for regenerating olfactory and supporting cells.

2. **What type of epithelium lines the paranasal sinuses?**
   - A) Stratified squamous epithelium
   - B) Simple cuboidal epithelium
   - C) Respiratory epithelium with few goblet cells
   - D) Transitional epithelium

   Answer: C) Respiratory epithelium with few goblet cells

4. **What structures are found in the lamina propria of the nasopharynx?**
   - A) Vocal cords
   - B) Pharyngeal tonsil and openings of Eustachian tubes
   - C) Alveoli
   - D) Lymph nodes

   Answer: B) Pharyngeal tonsil and openings of Eustachian tubes

5. **What is the primary function of the larynx?**
   - A) To filter and humidify inspired air
   - B) To produce voice and prevent food and fluid from entering the trachea
   - C) To assist in gas exchange
   - D) To trap pathogens

   Answer: B) To produce voice and prevent food and fluid from entering the trachea

6. **What type of cartilage forms the epiglottis?**
   - A) Hyaline cartilage
   - B) Elastic cartilage
   - C) Fibrocartilage
   - D) Bone

   Answer: B) Elastic cartilage

7. **How long is the larynx approximately?**
   - A) 2 cm
   - B) 4 cm
   - C) 6 cm
   - D) 8 cm

Answer: B) 4 cm

8. **What type of epithelium lines the larynx?**
   - A) Stratified squamous epithelium
   - B) Simple columnar epithelium
   - C) Respiratory epithelium
   - D) Transitional epithelium

   Answer: C) Respiratory epithelium

1. **How many pairs of mucosal folds (vocal cords) extend into the lumen of the larynx?**
   - A) One pair
   - B) Two pairs
   - C) Three pairs
   - D) Four pairs

   Answer: B) Two pairs

2. **What are the upper pair of vocal cords commonly called?**
   - A) True vocal cords
   - B) False vocal cords (vestibular folds)
   - C) Vocal ligaments
   - D) Vocalis muscles

   Answer: B) False vocal cords (vestibular folds)

3. **What type of epithelium covers the false vocal cords?**
   - A) Non-keratinized stratified squamous epithelium
   - B) Simple cuboidal epithelium
   - C) Respiratory epithelium
   - D) Transitional epithelium

   Answer: C) Respiratory epithelium

4. **What is the primary function of the false vocal cords?**
   - A) To produce sound
   - B) To guard against the entrance of food into the larynx
   - C) To assist in respiration
   - D) To regulate airflow

   Answer: B) To guard against the entrance of food into the larynx

5. **What type of epithelium covers the true vocal cords?**
   - A) Stratified cuboidal epithelium
   - B) Non-keratinized stratified squamous epithelium
   - C) Simple columnar epithelium
   - D) Respiratory epithelium

   Answer: B) Non-keratinized stratified squamous epithelium

6. **What anatomical structures compose the true vocal cords?**
   - A) Vocal ligaments and smooth muscle
   - B) Vestibular ligaments and skeletal muscle
   - C) Vocal ligaments and skeletal muscle (vocalis muscle)
   - D) Elastic cartilage and ciliated epithelium

   Answer: C) Vocal ligaments and skeletal muscle (vocalis muscle)

7. **How is sound produced by the true vocal cords?**
   - A) By changing the length of the larynx

- B) By tension of the cords and adjusting the distance between them
- C) By vibrating the cartilage of the larynx
- D) By the movement of air through the nasal cavity

Answer: B) By tension of the cords and adjusting the distance between them

8. **What are the two types of vocal cords called?**
   - A) Upper and lower vocal cords
   - B) True and false vocal cords
   - C) Vestibular and vocal folds
   - D) Respiratory and non-respiratory folds

   Answer: B) True and false vocal cords

1. **What is the approximate length of the trachea?**
   - A) 8-10 cm
   - B) 10-12 cm
   - C) 12-14 cm
   - D) 14-16 cm

   Answer: C) 12-14 cm

2. **What type of cartilage forms the rings that keep the trachea open?**
   - A) Elastic cartilage
   - B) Fibrocartilage
   - C) Hyaline cartilage
   - D) Bone

   Answer: C) Hyaline cartilage

3. **Which of the following is NOT one of the four layers of the tracheal wall?**
   - A) Mucosa
   - B) Submucosa
   - C) Elastic layer
   - D) Adventitia

   Answer: C) Elastic layer

4. **What type of epithelium lines the mucosa of the trachea?**
   - A) Squamous epithelium
   - B) Stratified epithelium
   - C) Respiratory epithelium
   - D) Transitional epithelium

   Answer: C) Respiratory epithelium

5. **Which layer of the trachea contains blood vessels and nerves?**
   - A) Mucosa
   - B) Submucosa
   - C) Cartilage layer
   - D) Adventitia

   Answer: B) Submucosa

6. **What is the function of the trachealis muscle?**
   - A) To provide structural support
   - B) To facilitate gas exchange
   - C) To contract during coughing
   - D) To produce mucus

Answer: C) To contract during coughing

7. **How does the contraction of the trachealis muscle affect the trachea during a cough?**
   - A) It increases the diameter of the trachea
   - B) It narrows the tracheal lumen
   - C) It decreases air velocity
   - D) It relaxes the trachea

   Answer: B) It narrows the tracheal lumen

8. **What connects the ends of the C-shaped cartilage rings in the trachea?**
   - A) Elastic fibers
   - B) Smooth muscle
   - C) Loose connective tissue
   - D) Both A and B

   Answer: D) Both A and B

1. **What type of cartilage is found in the primary bronchi?**
   - A) Hyaline cartilage
   - B) Elastic cartilage
   - C) Fibrocartilage
   - D) Complete rings of cartilage
   - **Answer:** D) Complete rings of cartilage

2. **Which of the following is NOT a layer of the wall of secondary bronchi?**
   - A) Mucosa
   - B) Musculosa
   - C) Submucosa
   - D) Adventitia
   - **Answer:** C) Submucosa

3. **What is the primary characteristic of the mucosa in the bronchi?**
   - A) Contains numerous goblet cells
   - B) Simple squamous epithelium
   - C) Highly folded respiratory epithelium
   - D) Contains ciliated cuboidal epithelium
   - **Answer:** C) Highly folded respiratory epithelium

4. **What type of cells are found in the mucosa of terminal bronchioles?**
   - A) Goblet cells
   - B) Clara cells
   - C) Ciliated epithelial cells
   - D) Squamous epithelial cells
   - **Answer:** B) Clara cells

5. **Which statement is true regarding the bronchioles?**
   - A) They contain cartilage and submucosa.
   - B) They have a complete layer of circularly arranged smooth muscle.
   - C) They are lined with stratified squamous epithelium.
   - D) They have numerous mucous glands.
   - **Answer:** B) They have a complete layer of circularly arranged smooth muscle.

6. **In which part of the bronchial tree do you find isolated cartilage plates?**
   - A) Primary bronchi

- B) Secondary bronchi
- C) Bronchioles
- D) Terminal bronchioles
- **Answer:** B) Secondary bronchi

7. **What type of tissue is associated with the lamina propria in the mucosa of the bronchi?
- A) Mucosa-associated lymphatic tissue (MALT)
- B) Adipose tissue
- C) Dense regular connective tissue
- D) Smooth muscle tissue
- **Answer:** A) Mucosa-associated lymphatic tissue (MALT)

8. **What is the main function of neuroepithelial bodies found in the bronchioles?**
- A) Secretion of mucus
- B) Gas exchange
- C) Chemosensory receptors for oxygen levels
- D) Structural support
- **Answer:** C) Chemosensory receptors for oxygen levels

1. **What is another name for Clara cells?**
- A) Goblet cells
- B) Club cells
- C) Ciliated epithelial cells
- D) Neuroepithelial cells
- **Answer:** B) Club cells

2. **Which of the following best describes the shape of Clara cells?**
- A) Squamous
- B) Columnar
- C) Dome-shaped
- D) Cuboidal
- **Answer:** C) Dome-shaped

3. **What type of granules do Clara cells contain?**
- A) Mucus granules
- B) Secretory granules
- C) Lysosomal granules
- D) Lipid granules
- **Answer:** B) Secretory granules

4. **Which organelle is abundant in the cytoplasm of Clara cells, indicating high secretory activity?**
- A) Mitochondria
- B) Golgi apparatus
- C) Basal rough endoplasmic reticulum (rER)
- D) Nucleus
- **Answer:** C) Basal rough endoplasmic reticulum (rER)

5. **What is one of the key defensive roles of Clara cells?**
- A) Secretion of mucus
- B) Production of surfactant
- C) Release of glycoprotein granules

- D) Regeneration of damaged epithelium
- **Answer:** C) Release of glycoprotein granules

6. **Which of the following functions is associated with the smooth endoplasmic reticulum (sER) in Clara cells?**
- A) Protein synthesis
- B) Degradation of inhaled toxins
- C) Production of mucus
- D) Cell division
- **Answer:** B) Degradation of inhaled toxins

7. **What substance do Clara cells secrete to prevent the collapse of bronchioles?**
- A) Mucus
- B) Surfactant-like substance
- C) Cytokines
- D) Proteolyase
- **Answer:** B) Surfactant-like substance

8. **What potential consequence can arise from mutations in Clara cells?**
- A) Asthma
- B) Lung fibrosis
- C) Adenocarcinoma of the lung
- D) Chronic bronchitis
- **Answer:** C) Adenocarcinoma of the lung

1. **Where does gas exchange primarily take place in the respiratory system?**
- A) Trachea
- B) Bronchi
- C) Alveoli
- D) Larynx
- **Answer:** C) Alveoli

2. **Which of the following structures is NOT part of the respiratory portion?**
- A) Respiratory bronchioles
- B) Alveolar ducts
- C) Alveolar sacs
- D) Secondary bronchi
- **Answer:** D) Secondary bronchi

3. **What type of epithelium lines the respiratory bronchioles?**
- A) Simple squamous epithelium
- B) Stratified squamous epithelium
- C) Simple cuboidal ciliated epithelium
- D) Ciliated columnar epithelium
- **Answer:** C) Simple cuboidal ciliated epithelium

4. **Which cells are present in the walls of respiratory bronchioles?**
- A) Goblet cells
- B) Clara cells
- C) Ciliated epithelial cells
- D) Type I alveolar cells
- **Answer:** B) Clara cells

5. **What characterizes alveolar ducts?**
   - A) They are lined with ciliated epithelium.
   - B) They have no smooth muscle at the distal end.
   - C) They do not contain any alveoli.
   - D) They primarily function in conducting air.
   - **Answer:** B) They have no smooth muscle at the distal end.
6. **Which type of cells line the alveolar ducts?**
   - A) Simple cuboidal cells
   - B) Goblet cells
   - C) Squamous and alveolar cells
   - D) Ciliated columnar cells
   - **Answer:** C) Squamous and alveolar cells
7. **What provides support at the distal end of the alveolar ducts?**
   - A) Smooth muscle
   - B) Cartilage
   - C) Elastic and collagen fibers
   - D) Connective tissue
   - **Answer:** C) Elastic and collagen fibers
8. **What is the role of Clara cells in the respiratory bronchioles?**
   - A) Gas exchange
   - B) Mucus secretion
   - C) Defense and secretion of surfactant-like substances
   - D) Structural support
   - **Answer:** C) Defense and secretion of surfactant-like substances
1. **What is the primary function of alveoli?**
   - A) Conducting air
   - B) Gas exchange
   - C) Mucus secretion
   - D) Structural support
   - **Answer:** B) Gas exchange
2. **What structure do alveoli open into?**
   - A) Trachea
   - B) Bronchi
   - C) Respiratory bronchioles, alveolar ducts, and alveolar sacs
   - D) Larynx
   - **Answer:** C) Respiratory bronchioles, alveolar ducts, and alveolar sacs
3. **What separates individual alveoli?**
   - A) Alveolar ducts
   - B) Inter-alveolar septa
   - C) Bronchial walls
   - D) Alveolar sacs
   - **Answer:** B) Inter-alveolar septa

4. **What are the pores of Kohn?**
   - A) Openings that connect alveoli for collateral ventilation

- B) Structures that prevent the collapse of alveoli
- C) Layers of smooth muscle in the alveolar walls
- D) Cells that produce surfactant
- **Answer:** A) Openings that connect alveoli for collateral ventilation

5. **What type of epithelium lines the alveoli?**
- A) Stratified squamous epithelium
- B) Simple cuboidal epithelium
- C) Alveolar epithelium formed of type I and type II pneumocytes
- D) Ciliated columnar epithelium
- **Answer:** C) Alveolar epithelium formed of type I and type II pneumocytes

6. **Which type of pneumocyte is primarily responsible for gas exchange?**
- A) Type I pneumocytes
- B) Type II pneumocytes
- C) Clara cells
- D) Ciliated epithelial cells
- **Answer:** A) Type I pneumocytes

7. **What is the function of type II pneumocytes?**
- A) Gas exchange
- B) Secretion of surfactant
- C) Structural support
- D) Defense against pathogens
- **Answer:** B) Secretion of surfactant

8. **What characterizes alveolar sacs?**
- A) They contain only one alveolus.
- B) They are lined with ciliated epithelium.
- C) They are groups of alveoli opening into a common central space.
- D) They have no connection to alveoli.
- **Answer:** C) They are groups of alveoli opening into a common central space.

1. **What is the primary function of inter-alveolar septa?**
- A) Conducting air
- B) Separating adjacent alveoli
- C) Producing surfactant
- D) Supporting bronchioles
- **Answer:** B) Separating adjacent alveoli

2. **What type of network do inter-alveolar septa contain?**
- A) Lymphatic network
- B) Richest capillary network
- C) Nervous network
- D) Muscular network
- **Answer:** B) Richest capillary network

3. **Where does gas exchange primarily occur?**
- A) In the bronchi
- B) In the inter-alveolar septa
- C) In the alveoli
- D) In the trachea

- **Answer:** C) In the alveoli
4. **What is the blood-air barrier found in the inter-alveolar septa?**
   - A) A barrier preventing airflow
   - B) A structure facilitating gas exchange
   - C) A barrier against pathogens
   - D) A structural support component
   - **Answer:** B) A structure facilitating gas exchange
5. **What type of fibers are inter-alveolar septa rich in?**
   - A) Collagen fibers only
   - B) Reticular fibers only
   - C) Elastic and reticular fibers
   - D) Smooth muscle fibers
   - **Answer:** C) Elastic and reticular fibers
6. **What cells are absent in inter-alveolar septa?**
   - A) Fibroblasts
   - B) Alveolar macrophages
   - C) Smooth muscle cells
   - D) Endothelial cells
   - **Answer:** C) Smooth muscle cells
7. **Which type of leucocytes migrate through the inter-alveolar septa to become alveolar macrophages?**
   - A) Neutrophils
   - B) Eosinophils
   - C) Monocytes
   - D) Lymphocytes
   - **Answer:** C) Monocytes
8. **What condition is characterized by the destruction of inter-alveolar septa?**
   - A) Asthma
   - B) Emphysema
   - C) Chronic bronchitis
   - D) Pneumonia
   - **Answer:** B) Emphysema
9. **Which viral infection is mentioned as causing destruction of inter-alveolar septa?**
   - A) Influenza
   - B) HIV
   - C) COVID-19
   - D) Measles
   - **Answer:** C) COVID-19
1. **What is the primary function of the blood-air barrier?**
   - A) Conducting air to the lungs
   - B) Preventing pathogens from entering the bloodstream
   - C) Allowing the exchange of O_2 and CO_2
   - D) Supporting lung structures
   - **Answer:** C) Allowing the exchange of O_2 and CO_2
2. **How many layers compose the blood-air barrier?**

- A) Two layers
- B) Three layers
- C) Four layers
- D) Five layers
- **Answer:** C) Four layers

3. **Which of the following is the first layer of the blood-air barrier?**
- A) Cytoplasm of endothelial cells
- B) Fused basal lamina
- C) Cytoplasm of type I pneumocytes
- D) Thin film of surfactant
- **Answer:** D) Thin film of surfactant

4. **What is found in the second layer of the blood-air barrier?**
- A) Alveolar macrophages
- B) Cytoplasm of type I pneumocytes
- C) Smooth muscle cells
- D) Mucous glands
- **Answer:** B) Cytoplasm of type I pneumocytes

5. **What makes up the third layer of the blood-air barrier?**
- A) Alveolar epithelium
- B) Fused basal lamina of type I pneumocytes and capillary endothelial cells
- C) Interstitial fluid
- D) Ciliated cells
- **Answer:** B) Fused basal lamina of type I pneumocytes and capillary endothelial cells

6. **Which cell type is found in the fourth layer of the blood-air barrier?**
- A) Type II pneumocytes
- B) Type I pneumocytes
- C) Endothelial cells
- D) Clara cells
- **Answer:** C) Endothelial cells

7. **What is the role of the thin film of surfactant in the blood-air barrier?**
- A) To facilitate gas exchange
- B) To reduce surface tension in the alveoli
- C) To provide structural support
- D) To prevent pathogen entry
- **Answer:** B) To reduce surface tension in the alveoli

8. **Where does the exchange of O_2 and CO_2 occur in the respiratory system?**
- A) In the bronchi
- B) In the trachea
- C) Across the blood-air barrier
- D) In the pleural space
- **Answer:** C) Across the blood-air barrier

1. **What is the origin of alveolar macrophages?**
- A) Neutrophils
- B) Blood monocytes
- C) Eosinophils

- D) Lymphocytes
- **Answer:** B) Blood monocytes

2. **What process do alveolar macrophages perform with dust particles?**
   - A) Secretion of mucus
   - B) Engulfing and digestion
   - C) Gas exchange
   - D) Transport of oxygen
   - **Answer:** B) Engulfing and digestion
3. **What are dust cells?**
   - A) Macrophages that engulf erythrocytes
   - B) Macrophages that engulf dust particles
   - C) Neutrophils found in the alveoli
   - D) Eosinophils involved in allergic reactions
   - **Answer:** B) Macrophages that engulf dust particles
4. **What are heart failure cells?**
   - A) Macrophages that engulf pathogens
   - B) Macrophages that engulf dust particles
   - C) Macrophages that contain hemosiderin granules from erythrocytes
   - D) Neutrophils present in congestive heart failure
   - **Answer:** C) Macrophages that contain hemosiderin granules from erythrocytes
5. **What histological feature is observed in the fetal lung?**
   - A) Clear lobulation due to thick connective tissue septa
   - B) Abundant alveoli lined with ciliated epithelium
   - C) Presence of mature type II pneumocytes
   - D) Simple squamous epithelium throughout
   - **Answer:** A) Clear lobulation due to thick connective tissue septa
6. **How does the epithelium of collapsed alveoli in the fetal lung appear?**
   - A) Simple squamous epithelium
   - B) Stratified squamous epithelium
   - C) Simple cuboidal epithelium
   - D) Ciliated columnar epithelium
   - **Answer:** C) Simple cuboidal epithelium
7. **What occurs to pulmonary blood vessels in the fetal lung?**
   - A) They are fully developed and functional
   - B) They are congested
   - C) They are non-existent
   - D) They are dilated and empty
   - **Answer:** B) They are congested
8. **What happens to the whole lung in water during fetal development?**
   - A) It floats due to air-filled alveoli
   - B) It sinks because the alveoli are collapsed and filled with fluid
   - C) It remains buoyant because of surfactant production
   - **Answer:** B) It sinks because the alveoli are collapsed and filled with fluid