SHORTNESS OF BREATH PRACTICE QUESTIONS

PART I: MULTIPLE CHOICE

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completions of the statement. Select the ONE lettered answer or completion that is BEST in each case.

1. Which of the following cell types are most important in the production of surfactant:
   A. Alveolar macrophages and Clara cells
   B. Clara cells and Type II cells
   C. Goblet cells and alveolar macrophages
   D. Type I cells and goblet cells
   E. Type I cells and Type II cells

2. The true vocal folds of the larynx:
   A. Are also called the vestibular folds
   B. Are located inferior to the false vocal folds
   C. Are normally covered, in adults, by the respiratory epithelium
   D. Contain a skeletal muscle known as the trachealis
   E. Contain more seromucous glands than are found in the false folds

3. The olfactory epithelium:
   A. Contains bipolar receptor cells
   B. Contains many Clara cells
   C. Contains many goblet cells
   D. Contains type I and type II alveolar cells
   E. Is a simple columnar epithelium

4. In a cross section of a small conducting bronchiole, you notice two blood vessels located immediately adjacent to the airway. The larger of the two vessels is most likely to be a branch of:
   A. A bronchial artery, carrying oxygen-poor blood
   B. A bronchial artery, carrying oxygen-rich blood
   C. A pulmonary artery, carrying oxygen-poor blood
   D. A pulmonary artery, carrying oxygen-rich blood
   E. A pulmonary vein, carrying oxygen-poor blood
   F. A pulmonary vein, carrying oxygen-rich blood
5. Which of the following lettered items lists the components of the minimal air-blood barrier of the alveoli in the correct anatomical order, starting from the alveolar airspace:
   A. Surfactant → nonfenestrated endothelial cell → fused basal lamina → type I alveolar cell
   B. Surfactant → type I alveolar cell → alveolar pores (of Kohn) → fused basal lamina → fenestrated endothelial cell
   C. Surfactant → type I alveolar cell → fused basal lamina → nonfenestrated endothelial cell
   D. Surfactant → type II alveolar cell → alveolar pores (of Kohn) → type I alveolar cell
   E. Surfactant → nonfenestrated endothelial cell → fused basal lamina → type II alveolar cell
   F. Surfactant → type II alveolar cell → fused basal lamina → fenestrated endothelial cell

6. In comparing a bronchus with a bronchiole:
   A. A bronchiole has Clara cells, but a bronchus does not.
   B. A bronchus has a pseudostratified epithelium. Depending on its size, a bronchiole may have either a pseudostratified or simple epithelium.
   C. A bronchus has mixed mucoserous glands. A bronchiole lacks glands.
   D. Secondary and tertiary bronchi have irregular plates of cartilage. A bronchiole has no cartilage.
   E. All the above

7. In human respiratory mucosa, repeated physical stress can cause the respiratory epithelium to be replaced by a stratified squamous epithelium that is more resistant to stress. Epithelial alterations of this type are referred to as:
   A. Dysplasia
   B. Dystrophy
   C. Metachromasia
   D. Metaplasia
   E. Metastasis

8. Which type of airway has the following characteristics?
   Its wall contains cartilage, smooth muscle and mucoserous glands. The lamina propria is separated from the submucosa by a layer of elastic tissue. The basement membrane is unusually thick.
   A. Conducting bronchiole
   B. Intrapulmonary bronchus
   C. Respiratory bronchiole
   D. Terminal bronchiole
   E. Trachea
9. The epithelium that is characteristic of a terminal bronchiole:
   A. Contains many Clara cells
   B. Contains many goblet cells
   C. Contains typical alveoli lined by type I and type II alveolar cells
   D. Is a pseudostratified columnar epithelium

10. Which of the following is a clinical condition that results from defective chloride channels in certain epithelial cells of the respiratory tract:
    A. Asthma
    B. Cystic fibrosis
    C. Emphysema
    D. Infant respiratory distress syndrome
    E. Pneumonia

11. Alveolar type I cells are:
    A. Ciliated cells that move mucus
    B. Columnar cells that secrete mucus
    C. Phagocytic cells that clean the alveolar surface
    D. Rounded cells that secrete surfactant
    E. Squamous cells involved in gas exchange

12. In the airways of the lung, cells with motile cilia:
    A. Are absent in respiratory bronchioles
    B. Are found in the olfactory epithelium
    C. Are the predominant cell type in Bowman’s glands
    D. Are the stem cells for the respiratory epithelium
    E. Move mucus and trapped particulate matter toward the larynx
    F. All the above

13. In an electron micrograph of the lung you observe a cell that has the following characteristics. It is part of a simple columnar epithelium, and has numerous small secretory granules that are located in the basal region of its cytoplasm. This cell is most likely to be a/an:
    A. DNES (diffuse neuroendocrine system) cell
    B. Goblet cell
    C. Olfactory receptor cell
    D. Secretory cell of Bowman’s gland
    E. Type II cell
14. The most numerous cell type in the olfactory epithelium has most of its nuclei in an intermediate position midway between the basal and apical plasma membranes. That cell type is:
   A. Clara cells
   B. DNES cells
   C. Goblet cells
   D. Olfactory receptor cells
   E. Sustentacular cells

15. Which of the following is found in or on the surface of an interalveolar septum, and is also a part of the minimal air-blood barrier across which gas exchange occurs:
   A. Alveolar macrophages
   B. Alveolar pores (of Kohn)
   C. Clara cells
   D. DNES cells
   E. Fenestrated capillary endothelial cells
   F. Surfactant
   G. Type II alveolar cells

16. Terminal bronchioles belong to the __________ portion of the respiratory tract. They give rise directly to __________.
   A. Conducting .......... alveolar ducts
   B. Conducting .......... alveolar sacs
   C. Conducting .......... respiratory bronchioles
   D. Respiratory .......... alveolar ducts
   E. Respiratory .......... alveolar sacs
   F. Respiratory .......... respiratory bronchioles

17. Which of the following cell types is still capable of division:
   A. Alveolar type II cell
   B. Clara cell
   C. Olfactory receptor cell
   D. All the above
   E. Only choices A and B
   F. Only choices B and C

18. The structure of the trachea differs from that of an intrapulmonary bronchus in which of the following ways:
   A. Lamina propria is separated from submucosa by elastic tissue in the trachea, but by smooth muscle in an intrapulmonary bronchus
B. The wall of the trachea contains hyaline cartilages, but the wall of a bronchus contains elastic cartilages
C. The epithelium of the trachea contains DNES cells, goblet cells and Clara cells; the epithelium of an intrapulmonary bronchus has goblet and Clara cells, but lacks DNES cells
D. There is smooth muscle in the wall of an intrapulmonary bronchus, but not in the trachea

**DIRECTIONS:** Each of the numbered items or incomplete statements in this section is negatively phrased, as indicated by a capitalized word such as NOT, LEAST, or EXCEPT. Select the ONE lettered answer or completion that is BEST in each case.

19. You are examining autopsy slides of the respiratory system of an adult male. All the following findings represent normal histological findings EXCEPT:
   A. The olfactory epithelium lacks goblet cells
   B. In the trachea, the mucous-secreting glands are found only in the adventitia
   C. The luminal epithelium of the bronchi is pseudostratified; in the terminal bronchioles it is simple
   D. Clara cells are present in the terminal bronchioles
   E. There are openings in the interalveolar septa that are large enough to allow cells to pass back and forth between adjacent alveoli

20. In the normal larynx of a young adult you would usually find all the following features EXCEPT:
   A. Elastic fibers in the vocal ligaments
   B. Hyaline cartilage in the thyroid cartilage, and fibrocartilage in the epiglottis
   C. Squamous metaplasia on the inferior pair of mucosal folds
   D. Mixed mucous-secreting glands in the vestibular folds
   E. Skeletal muscle in the true vocal folds
1. B
2. B
3. A
4. C
5. C
6. E
7. D
8. E
9. A
10. B
11. E
12. E
13. A
14. D
15. F
16. C
17. D
18. A
19. B
20. B