KAHSSO MOCK 3012 MIDTERM 1

DICLAIMER: This exam does not contain the exam material in its entirety and should not be used as the only source of studying. The questions are made by KAHSSO peer tutors. Please visit the website at: http://kahsso.club.yorku.ca/kahsso-peer-tutor-program/tutoring-schedule/ to find the schedule.

1. What about positive feedback is true?
    A. The response adds to the initial stimulus
    B. It is the most common form of feedback
    C. Clot of formation is an example of positive feedback
    D. A and B
    E. A and C
    F. B and C
    G. All of the above

2. What is true about alveolar epithelial cells?
    A. Type I cells secrete surfactant
    B. Type II cells are flat for gas exchange
    C. Both of the above are true
    D. Neither of the above are true

3. Intrapleural pressure is defined as the hydrostatic pressure of the intrapleural fluid
    A. True
    B. False

4. The steps of inhalation do NOT include:
    A. Contraction of the diaphragm
    B. A decrease in transpulmonary pressure
    C. The expansion of the lungs
    D. Alveolar pressure becomes subatmospheric

5. What about elastic recoil is FALSE:
    A. If transpulmonary pressure is greater than recoil, lung expands
    B. As the lung expands, recoil decreases
    C. The lung is at equilibrium of transpulmonary pressure is equal to recoil
    D. All of the above are false
    E. All of the above are true

6. We change transpulmonary pressure by changing atmospheric pressure
    A. True
    B. False

7. What directly determines lung compliance?
    A. The stretchability of the lung tissue
    B. Surface tension at the air-water interface
    C. Transpulmonary pressure
    D. A and B
    E. A and C
    F. B and C

8. What about surfactant is true?
    A. It strengthens the bonds between water molecules
    B. It reduces alveolar surface tension
    C. It decreases the work of breathing
    D. It is secreted by type I alveolar cells
    E. A and B
    F. B and C
    G. B and D
    H. All of the above are true

9. What is the most important factor that airway resistance is dependant upon?
    A. Tube length
    B. Interactions between gas molecules
    C. Airway radius
    D. Amount of surfactant secreted

10. If someone has a tidal volume of 550 ml/breath and a respiratory rate of 15 breaths per minute, what is their minute ventilation?
    A. 6.60 L/min
    B. 7.25 L/min
    C. 8.25 L/min
    D. 9.00 L/min

11. What approximately how much air is in the respiratory dead space?
    A. 100 mL
    B. 150 mL
    C. 300 mL
    D. 350 mL

12. If the atmospheric pressure is 760 mmHg, and the air is made up of 30% oxygen, what is the partial pressure of oxygen?
    A. 125 mmHg
    B. 228 mmHg
    C. 320 mmHg
    D. 450 mmHg

13. What factors cause the Hb kinetics curve to shift to the right?
    A. An increase in partial pressure of carbon dioxide
    B. A decrease in acidity
    C. A decrease in temperature
    D. All of the above

14. As oxygen binds to Hb, Hb's affinity for oxygen decreases
    A. True
    B. False

15. Where does gas exchange occur?
    A. alveolar ducts and sacs
    B. alveolar sacs
    C. respiratory bronchioles
    D. All of the above

16. During hyperpnea which of the following occurs?
    A. increase in ventilation, decrease in carbon dioxide
    B. increase in ventilation matches carbon dioxide
    C. ventilation is greater than carbon dioxide production
    D. ventilation is less than carbon dioxide production

17. Which of the following steps of expiration is correct?
    A. diaphragm and Inspiratory muscles stop contracting ->chest recoils inward -> intrapleural pressure decreases -> transpulmonary pressure decreases -> air in alveoli compressed -> air in alveoli greater than atmosphere
    B. diaphragm and Inspiratory muscles stop contracting ->chest recoils inward -> intrapleural pressure increases-> transpulmonary pressure decreases -> air in alveoli compressed-> air in alveoli greater than atmosphere
    C. diaphragm and Inspiratory muscles stop contracting ->chest recoils inward -> intrapleural pressure decreases -> transpulmonary pressure increases -> air in alveoli compressed -> air in alveoli greater than atmosphere
    D. diaphragm and Inspiratory muscles stop contracting ->chest recoils inward -> intrapleural pressure increases -> transpulmonary pressure decreases -> air in alveoli compressed -> air in alveoli greater than atmosphere

18. What is the most important factor that affects oxygen carrying capacity at altitude?
    A. the fraction of oxygen in the atmosphere
    B. the partial pressure of oxygen in the atmosphere
    C. the solubility coefficient of oxygen
    D. a and c
    E. all of the above

19. The lung stops expanding during inspiration because
    A. alveolar pressure is greater than intrapleural pressure
    B. intrapleural pressure is greater than alveolar pressure
    C. Transpulonary is less than recoil
    D. Transpulmonary pressure is equal to recoil

20. Identify the correct order of how a coordinated response occur?
    A. stimuli -> Sensor -> effector -> integrating center -> response
    B. stimuli -> Sensor -> integrating center -> response -> effector
    C. stimuli -> Sensor -> integrating center -> effector -> response
    D. Stimuli -> sensor -> response -> integrating center -> effector
    Bonus: What are examples of each during regulated ventilation

21. During inspiration which of the following is true?
    A. oxygen has a higher solubility coefficient than carbon dioxide and therefore more oxygen is available for gas exchange during inspiration
    B. Gas tanks are useful when someone is out of breathe at sea level
    C. alveolar dead space can't affect gas exchange at sea level because there is an optimal partial pressure of oxygen in the atmosphere
    D. surfactant helps reduces the interaction between water molecules which makes inspiration efficient
    E. There is a higher fraction of oxygen than carbon dioxide and therefore more oxygen is available for gas exchange during inspiration as stated by Henry's law.
    F. There is an increase in intrapleural pressure during inspiration

22. Choose the most correct answer and explain why the other answers are wrong.
    A. Hemoglobin has 4 heme groups and 4 globin subunits therefore oxygen and carbon dioxide can be carried at the same time.
    B. Hemoglobin is an erythrocyte
    C. an increase in body temperature shifts the oxygen-hemoglobin dissociation curve to the right
    D. hemoglobin binds to oxygen at the alveoli and then travels to the capillaries where oxygen is transported in the plasma

23. Which of the following is correct
    A. leukotrienes reduce the inflammation of the airways
    B. transpulmonary pressure is a physical factor that increases airway resistance
    C. vasoactive peptides constrict the airway
    D. both emphysema and pulmonary fibrosis affects the elastic connective tissue of the alveoli therefore increasing airway resistance
    E. b and d
    F. a b and d
    G. all of the above

24. On the oxygen equilibrium curve, a rightward shift would:
    A. Increase O_2 loading of haemoglobin in the lungs
    B. Increase O_2 unloading of haemoglobin in the tissues
    C. Decrease O_2 loading
    D. Decrease the number of CO_2 molecules on haemoglobin

25. What factors in combination would increase haemoglobin affinity for oxygen?
    A. Increase in pH
    B. Decrease in temperature
    C. Increase in temperature
    D. Decrease in pH
    E. Both a and b

26. The driving force of lung expansion is causes by the difference in which two pressures?
    A. Pulmonary pressure, atmospheric pressure
    B. Intrapleural pressure, interpleural pressure
    C. Intrapleural pressure, intra-alveolar pressure

27. Which difference in two pressures leads to air movement in and out of the lungs?
    A. Intrapleural pressure, interpleural pressure
    B. Pulmonary pressure, atmospheric pressure
    C. Atmospheric pressure; intra-alveolar pressure
    D. Intrapleural pressure; intra-alveolar pressure

28. What is Transpulmonary pressure?
    A. is the driving force for air movement into and out of lungs
    B. is not the driving force for lung expansion.
    C. none of the above

29. Which of these factors will decrease airway resistance?
    A. Decrease airway radius
    B. Increase airway radius
    C. Asthma
    D. All of the above
    E. None of the above

30. What is Pulmonary surfactant?
    A. Removes all water from the lungs.
    B. Smaller quantities in larger, compared to smaller alveoli.
    C. is important for tension in the lungs.
    D. Blocks bonding in the air-alveolar region.

31. Pneumothorax is an obstructive lung disease.
    A. True
    B. False

32. Obstructive lung diseases cause reduction in the air flow rate.
    A. True
    B. False

33. Emphysema is a restrictive lung disease.
    A. True
    B. False

34. The two types of pneumothorax are tension and open.
    A. True
    B. False

35. Which of the following about alveoli is false?
    A. They have a high surface area
    B. They are the site of gas exchange within in the lung
    C. There are 2 types of alveolar epithelial cells
    D. Type 1 alveolar cells secrete surfactant

36. Which of the following results in a high flow of air in the lung?
    A. A high ΔP
    B. A high R
    C. A Low ΔP
    D. All of the have the same effect on bulk flow
    E. None of the above factors effect bulk flow

37. Which of the following determines ΔP in the lung?
    A. Alveolar and Intrapleural pressure
    B. Alveolar and Atmospheric pressure
    C. Transpulmonary pressure
    D. All of the above
    E. A and C only

38. After inhalation both the volume and pressure within the thoracic cavity increases.
    A. True
    B. False

39. During inspiration:

A. Diaphragm contracts, intercostals contract, intrapleural pressure decreases, alveoli collapse

B. Diaphragm contracts, intercostals contract, intrapleural pressure increases, alveoli expand

C. Diaphragm contracts, intercostals contract, intrapleural pressure decreases, alveoli expand

D. Diaphragm contracts, intercostals contract, intrapleural pressure increases, alveoli Collapse

40. A lung that has a large increase in volume compared to a lung that has a minimal increase in volume at any given transpulmonary pressure has greater compliance.

A. True

B. False

41. If an individual has a tidal volume of 500mL, dead space of 150mL and breathing 15 breaths/min what is his/her minute ventilation?

A. 9750mL/min

B. 5250mL/min

C. 7.5L/min

D. None of the above

42. Which of the following gases will have a lower partial pressure at an atmospheric pressure of 760mmHg?

A. Gas Fraction = 0.3

B. Gas Fraction = 0.02

C. Oxygen

D. Carbon Dioxide

43. If Hb binds 1.3 mL O2/g, and an individual has a [Hb] = 14g/100mL and pumps 4.5L blood/min, how much O2 does this individual pumped per minute?

A. 82,000 mL O2/min

B. 18.2 mL O2/100 mL blood

C. 820 mL O2/min

D. 18.2 mL O2/min

44. What percentage of hemoglobin is bound to oxygen at sea level?

A. ~100%

B. ~90%

C. ~85%

D. ~20%

45. Less hemoglobin is bound to oxygen at altitude because there is less oxygen in the air.
    A. True
    B. False

46. Which of the following causes the Hb saturation curve to shift to the right?
    A. Increased partial pressure of CO2
    B. Increased [H+]
    C. Increased temperature
    D. Increased anaerobic energy production
    E. All of the above
    F. Only A-C