3100B HFOV Competency Exam

(Circle the appropriate answer)

1. The following statement is TRUE
   a. Decreasing frequency results in a lowered PaCO₂
   b. Controls for oxygenation and ventilation are the same
   c. Frequency is the primary control for CO₂ elimination in HFOV

2. The following statement is true
   a. Tidal volumes delivered by HFOV are typically less than the physiological dead space of the patient.
   b. HFOV is a volume controlled, pressure limited ventilator.
   c. HFOV requires the use of a special endotracheal tube.

3. The 3100B’s method of oxygenation is very effective because it
   a. Stimulates the production of endogenous surfactant
   b. Maintains an open alveolus by not allowing critical closure, eliminating the need for constant re-inflation.
   c. Utilizes a diffusion process called Brownian movement

4. Of the following, which describes the mechanics of ventilation used by the 3100B?
   a. Active inspiration with passive exhalation
   b. Active inspiration and active exhalation
   c. Passive inspiration with active exhalation

5. Ventilation and CO₂ exchange using the 3100B is best described by
   a. Ventilation is a function of large tidal volumes at low Paw
   b. Ventilation is a function of I:E ratio
   c. Ventilation is a function of frequency and Vt²
6. Pulmonary Injury Sequence may progress by which of the following processes
   a. Normal respiratory cycles (tidal volume ventilation) in a surfactant impaired lung
   b. HFOV with topical steroids and sympathomimetic Rx.
   c. Over-stimulation of smooth muscle tissue caused by histamine release

7. HFOV in ARDS is most efficiently administered
   a. After the patient has been on conventional mechanical ventilation for at least one week
   b. With an initial Paw of 5cmH₂O above conventional Paw
   c. When the patient has marginal hemodynamic function

8. Choose the proper sequence for management of CO2 elimination
   a. Frequency, amplitude, I:E ratio
   b. I:E ratio, Frequency, Amplitude
   c. Amplitude, Frequency, I:E ratio

9. The control of mean airway pressure in the 3100B is regulated by
   a. Restricting the bias flow past the green balloon valve
   b. Using an external PEEP valve
   c. An electronic pressure transducer

10. Increasing the Power Control will most likely result in the following
    a. A drop in minute ventilation and a rise in PaCO₂
    b. An increase in minute ventilation and a rise in PaCO₂
    c. An increase in minute ventilation and a drop in PaCO₂

11. Which alarms stop the oscillator and opens the circuit pressure to atmospheric pressure?
    a. Paw > 60 cmH₂O or Paw < 5 cmH₂O
    b. Volume limit
    c. High or Low Mean Airway Pressure Limit

12. Delta-P or Amplitude is primarily attenuated by the following
    a. Endotracheal tube size
    b. Patient weight
    c. Patient diagnosis
13. A diminished chest wiggle along with a drop in SaO2 might signal the following
   a. Improved compliance
   b. Need for suctioning
   c. Drop in cardiac output

14. The Patient Circuit Calibration procedure should be performed
   a. At least every 500 hours
   b. Whenever switching patient circuits or circuit components
   c. Only when putting a new patient on the 3100B

15. Erratic Paw readings can be caused by
   a. Low voltage to the oscillator magnet
   b. A change in the air or oxygen line pressures
   c. Spontaneous breathing

16. Adequate chest movement for an adult patient on HFOV can best be described as
   a. Visible down to the patient’s toes
   b. Above the diaphragm
   c. From the chest to mid-thigh

17. A deliberately induced endotracheal tube cuff leak may achieve the following
   a. Cause a rise in PaCO2 due to a drop in delivered volumes
   b. Cause a drop in PaCO2 due to increased wash-out by the bias flow
   c. Cause a rise in delivered Paw

18. Auscultation of heart and bowel sounds is best accomplished by
   a. Stopping the oscillator for 20-30 seconds. Paw will be maintained.
   b. Shutting off the ventilator
   c. Auscultation should be performed with the oscillator running

19. Pneumothorax can be best determined on HFOV by
   a. Auscultation
   b. Loss of chest wiggle on the affected side. Confirm with chest x-ray
   c. Changes in displayed Paw and Delta-P
20. Focus should be placed on weaning which HFOV parameter first
   a. Amplitude
   b. Frequency
   c. FiO₂

21. The following statement best describes weaning large patients from HFOV
   a. Patients can be weaned and extubated directly from HFOV
   b. Spontaneous breathing is not well tolerated on HFOV and patients should be transitioned to CMV for weaning
   c. Weaning should not be attempted until the Amplitude is reduced to 40.

22. Erratic Paw display IS NOT caused by the following
   a. Inappropriately low setting of the Paw limit thumbwheel
   b. Spontaneous breathing
   c. Secretions in the airway

23. If the Max Paw alarm is met, the ventilator will:
   a. Depressurize to 12(±3)cmH₂O below the Set Max Paw setting, continue to cycle, providing audible and visual alarms until the fault is resolved.
   b. Depressurize to ambient pressure and stop the driver.
   c. Continue to run, but visually alarm to alert the user

24. The following statement DOES NOT describe hemodynamic response to HFOV
   a. Transient hypotension due to relatively high Paw’s usually responds well to fluid bolus or vasopressors
   b. All patients experience hypotension when transitioned from CMV to HFOV
   c. Hypotensive patients should be given adequate preload and/or vasopressors prior to transition to HFOV

25. Opacification of lung fields, along with a low SaO₂ indicates the following
   a. Underinflation, requiring an increase in Paw
   b. Overinflation, requiring a decrease in Paw
   c. Underinflation, requiring an increase in FiO₂

Note: This exam is not designed to be a comprehensive evaluation of the clinical skills necessary to manage patients on HFOV.