1. What is the difference between capnography and capnometry?
   A. **CAPNOMETRY - IS THE MEASUREMENT AND NUMERICAL DISPLAY OF CO₂ APPEARING AT THE AIRWAY.**
   B. **CAPNOGRAPHY - IS THE MEASUREMENT AND GRAPHIC DISPLAY OF THE CO₂ APPEARING AT THE AIRWAY.**

2. Name the two principle ways of measuring exhaled CO₂.
   A. **MAINSTREAM SAMPLING**
   B. **SIDESTREAM SAMPLING**

3. Draw a capnogram and label the four phases. Explain the significance of each phase.

4. List the normal value for the following
   A. **PICO₂**: 0.3 mm Hg
   B. **Paco₂**: 40 mm Hg
   C. **FiCO₂**: 0.03%
   D. **PETCO₂**: 30-35 mm Hg
   E. **PAco₂**: 40 mm Hg
   F. **PĒCO₂**: 30-35 mm Hg

5. What color will a colorimetric carbon dioxide detector (Easy Cap) turn if the endotracheal tube is in the trachea? **BIG BIRD GOOD, BARNEY BAD (YELLOW GOOD)**

6. What color will it be after 6 breaths if the tube is in the esophagus? **PURPLE**
7. What is the normal a-ADCO$_2$ gradient? **LESS THAN 5 mm Hg.**

8. Explain the effects of Deadspace on the a-ADCO$_2$ gradient. **INCREASES**

9. Explain the effects of shunting on the a-ADCO$_2$ gradient. **NO CHANGE**

10. What will happen to the CO$_2$ gradient in pure hyperventilation or pure hypoventilation? **THERE ARE NO REAL $V/Q$ ABNORMALITIES IN PURE HYPER- OR HYPOVENTILATION. IF THE PACO$_2$ INCREASES, PETCO$_2$ WILL INCREASE UNLESS IT IS SO SEVERE THAT THE PATIENT IS NOT BREATHING AT ALL (RESPIRATORY ARREST) OR IS ONLY MOVING DEADSPACE GAS (INEFFECTIVE VENTILATION). IN THIS INSTANCE, THE PETCO$_2$ WILL SHARPLY DECREASE.**

11. Draw a picture of the capnogram you would expect to see with COPD.

12. List 4 clinical conditions that would result in an increase in alveolar deadspace.
   A. COPD
   B. PULMONARY HYPOPERFUSION
   C. PULMONARY EMBOLISM
   D. AIR EMBOLISM
   E. CARDIAC ARREST
   F. SHOCK (HYPOVOLEMIA OR CARDIOGENIC)

13. List 3 clinical conditions that would result in an increase in capillary shunting.
   A. ATELECTASIS
   B. PNEUMONIA
   C. MUCUS PLUGGING
   D. BRONCHIAL INTUBATION

14. Explain how you might use the a-ADCO$_2$ gradient to track the level of optimal PEEP.
   **THE PETCO$_2$ CORRELATES WITH CARDIAC OUTPUT (PULMONARY BLOOD FLOW). AS PEEP BECOMES SUB-OPTIMAL, THE GRADIENT WILL WIDEN.**
15. Explain how the following conditions would effect the capnogram tracing:
   A. Hyperthermia: INCREASE IN PETCO₂
   B. Hypothermia: SUSTAINED LOW PETCO₂
   C. Decreased perfusion: EXPONENTIAL DECREASE IN PETCO₂
   D. Rebreathing of CO₂: A RISE IN THE BASELINE
   E. Partial airway obstruction: SUSTAINED LOW PETCO₂
   F. Hyperventilation: SUSTAINED LOW PETCO₂
   G. Hypoventilation: INCREASE IN PETCO₂

16. Explain what is meant by the curare cleft.

   A DOWNWARD SPIKE ("CURARE CLEFT") MAY BE SEEN THE PATIENT RECOVERING FROM NEUROMUSCULAR BLOCKADE.

17. Draw a picture of a slow speed capnogram.