Questions 1-3

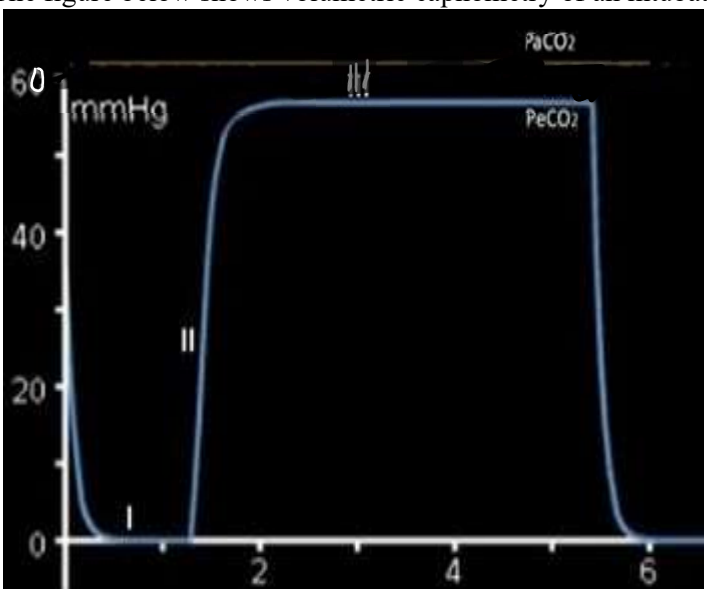
1) All are components of the alveolar gas equation except
   A) $PaCO_2$
   B) Barometric pressure of water
   C) PaO_2
   D) FiO_2

2) What is the expected PaO_2 in a healthy patient breathing room air at sea level?
   A) 60 mmHg
   B) 80 mmHg
   C) 90 mmHg
   D) 110 mmHg

3) A presumably healthy 18-year-old male intubated for appendicitis surgery and ventilated with 100% FiO_2. His ABG: PH 7.32, $PaCO_2$ 50, PaO_2 450. What is the Alveolar-arterial (A-a) gradient?
   A) 10
   B) 50
   C) 100
   D) 200

4) For the patient above, the respiratory rate was increased. Repeat ABG shows $PaCO_2$ of 30 mmHg now. The PaO_2 would:
   A) Decrease by 25 mmHg
   B) Remains the same
   C) Increase by 20 mmHg
   D) Increase by 25 mmHg

5) The figure below shows volumetric capnometry of an intubated patient. What is the expected $PaCO_2$?



Valv: alveolar minute ventilation 3.9L/min, VCO_2: carbon dioxide production per 268 minute,

A) 30 mmHg
B) 40 mmHg
C) 50 mmHg
D) 60 mmHg

6) A patient is mechanically ventilated with the volume-controlled mode with tidal volume 500 ml, $PaCO_2$ is 50 mmHg, $PeCO_2$ is 40 mmHg. What is the estimated total dead space?

A) 50 ml
B) 100 ml
C) 150 ml
D) 200 ml

7) A patient with DKA, has ABG as follows on room air: PH 7.1, HCO3 10 mEq/L, Anion gap of 25, $PaCO_2$ 32 mmHg, PaO_2 of 80 mmHg. The patient has:

A) Normal ventilation
B) Hypoventilation
C) Hyperventilation

8) All of the following are components of the Oxygen content equation except:

A) Hemoglobin
B) $PaCO_2$
C) PaO_2
D) SaO_2

9) A patient in ICU has cardiac output of 2.5 L/min, PaO_2 of 70, SaO_2 of 95%, Hemoglobin 9 g/dl. Oxygen delivery DO_2 equals:

A) 200 ml/min
B) 280 ml/min
C) 300 ml/min
D) 350 ml/min

10) A patient with ARDS is being ventilated with the volume-controlled mode. Settings are as follows: Peak inspiratory pressure 30 cmH_2O, Plateau pressure 23 cmH2O, PEEP 8 cmH_2O, tidal volume 400 ml, RR 25/min, Inspiratory flow 50 Lit/min. What is the calculated mechanical power?

A) 10 J/min
B) 15 J/min
C) 20 J/min
D) 25 J/min