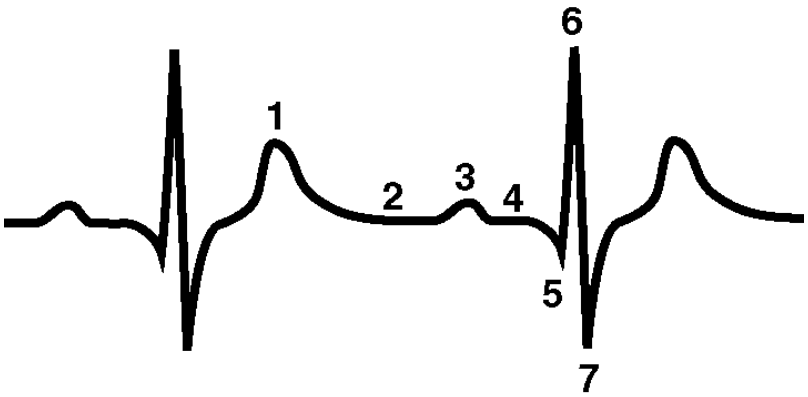
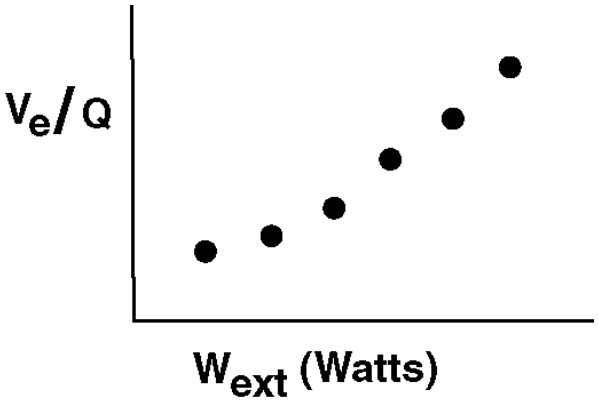
Human Physiology Lab – IPHY 3435
Sample Questions for Exam 2, Spring 2007



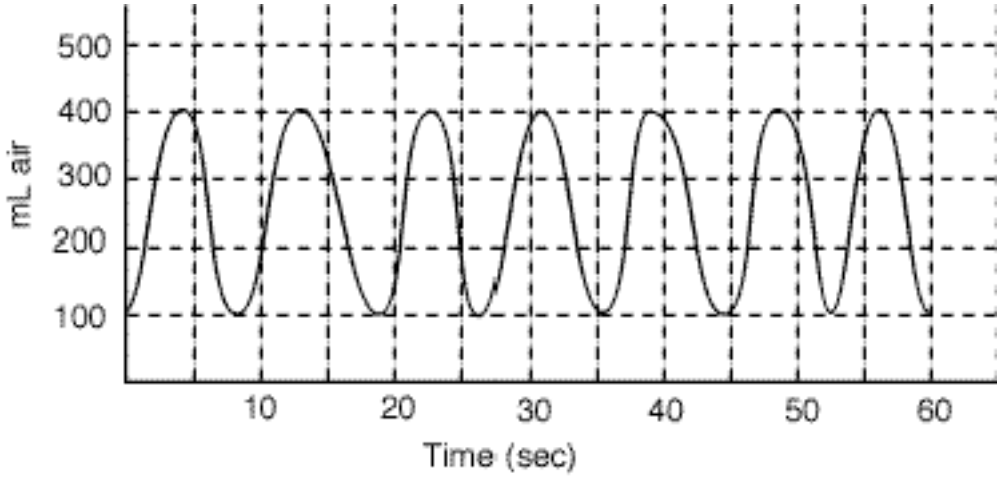
Questions 1-4 refer to the above figure which shows a typical (but smoothed out) EKG from the human cardiovascular lab.

1. Which part of the recording indicates the repolarization of the ventricles? _____
2. Which part of the recording indicates the depolarization of the atria? _____
3. If a drug is administered that slows down conduction through the AV node, which portion of the curve would be stretched out horizontally? _____
4. Which section is the P-R interval? _____



5. Based on the graph shown above, you can conclude that in this experiment
   A. The ventilation/perfusion ratio was less than 1.
   B. Tidal volume increased throughout the experiment.
   C. Cardiac output did not increase as exercise intensity increased.
   D. Ventilation increased faster than cardiac output as exercise intensity increased.
   E. The measurements were taken from an untrained individual, because Ve/Q increased over time.

6. If a subject's heart sounds like "lub-murmur-dub, lub-murmur-dub", this indicates:
   A. Tachycardia
   B. Diastolic murmur
   C. Systolic murmur
   D. Atrial fibrillation
   E. Ventricular fibrillation



7. The graph above shows the result from a spirometry experiment. What is the value of Ve_{ATP}?

a) 300 mL air/min
b) 400 mL air/min
c) 700 mL air/min
d) 2100 mL air/min
e) 2400 mL air/min

8. Rodney the rat is twice as heavy as Milford the mouse. From what you know about allometry, you predict that:

A. VO2 (mL O2/min) is twice as great for Rodney, compared to Milford.
B. VO2 (mL O2/min) is slightly less than twice as great for Rodney, compared to Milford.
C. VO2 (mL O2/min) is the same for Rodney, compared to Milford.
D. VO2 (mL O2/min) is less for Rodney, compared to Milford.

9. Given the following information and the table below, calculate the metabolic rate in kcal/min. Please show calculations and use proper units.
VO2 = 500 mL/min., FeO2 = 0.150, VCO2 = 400 mL/min, FeCO2 = 0.020.

RQ	kcal/L O2
0.7	4.686
0.75	4.739
0.8	4.801
0.85	4.862
0.9	4.924
0.95	4.985
1.0	5.047

10. The fractional concentration of CO2 in inspired air is approximately

A. 3%

B. 0.3%
C. 0.03%
D. 0.003%
E. 0.0003%

11. After five minutes sitting quietly an an exercise bike, Joan begins pedaling at 70 rpm. Which of the following is occurring during the first three minutes that Joan is pedaling?

A. Vasoconstriction is being initiated in the active leg muscles.
B. Lactic acid is being produced in the active leg muscles.
C. Joan's cardiac output is staying constant.
D. The stroke volume of Joan's heart is decreasing.
E. Sympathetic stimulation of Joan's heart is decreasing.

12. While measuring a subject's blood pressure in the usual way, you notice that the "thumping" sound disappears when the pressure in the cuff reaches 110 mm Hg. This indicates that

A. The systolic blood pressure is 110 mm Hg.
B. The diastolic blood pressure is 110 mm Hg.
C. The pulse pressure is 110 mm Hg.
D. The mean arterial pressure is 110 mm Hg.

ANSWERS
1. 1
2. 3
3. 4
4. 4
5. D
6. C
7. d
8. B
9. (1) RQ = 400/500 = 0.8; (2) From table, caloric equivalent = 4.801 kcal/L O2; (3) VO2 = 500 mL/min. = 0.5 L/min.; (4) Met. Rate = (0.5 L O2/min.) x (4.801 kcal/L O2) = **2.4 kcal/min.**
10. C
11. B
12. B