SAMPLE OF LAB EXAM QUESTIONS WITH STUDENT LEARNING OUTCOMES ASSIGNED

1. Students in Dr. Powells’ lab investigated the effects of different odorous chemicals on the stress response. They discovered the cherry smell associated with cough medicine induced a greater stress response compared to a cinnamon smell. What kind of data would you expect from these conclusions?  
   a. cherry smell caused a greater increase in GSR compared to the cinnamon smell  
   b. cinnamon smell caused a greater increase in GSR compared to the cherry smell  
   c. cherry smell caused a greater decrease in skin temperature compared to the cinnamon smell  
   d. a and c  
   e. b and c  

2. Students in Dr. Pagan’s lab investigated the effects of music tempo on stress level (see graph above). Based on these results, which student found the fast music to be the least stressful?  
   a. Sara  
   b. Katie  
   c. Katlyn  
   d. Kevin  
   e. Tara

3. Based on the results above, which student found no music to be the most stressful?  
   a. Sara  
   b. Katie  
   c. Katlyn  
   d. Kevin  
   e. Tara

4. Diet pills have been shown to increase heart rate. What effect would diet pills have on the ECG?  
   a. Increase R-R duration  
   b. Decrease R-R duration  
   c. Increase P wave amplitude  
   d. Increase QRS amplitude

Student Learning Outcomes (SLO) #1: Physiological Principles, SLO#2 = Scientific Approach, SLO#3 = Creative and Critical Thinking.
5. What is the heart rate, calculated using the peak-to-peak measurement (0.8 sec) from the tracing below? (Show your work)  

ANSWER: __________________________________________  

SLO’s 1 and 3

6. Identify two features that distinguish the “pulmonary circuit” from the “systemic circuit”.

SLO 1

7. Label and identify the events responsible for each wave from the ECG tracing shown below.

SLO 1

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8. From the spirometer tracing below, determine the A. tidal volume, B. Expiratory reserve volume, C. Inspiratory reserve volume, and D. Forced vital capacity. Show your calculations.

Student Learning Outcomes (SLO) #1: Physiological Principles, SLO#2 = Scientific Approach, SLO#3 = Creative and Critical Thinking.
9. State the full name for, and define the abbreviation for FEV$_1$. Define the meaning of FVC.  

   SLO 1

10. Why are pulmonary function tests such as measurement of lung volume by spirometry useful in science?  

   SLO 3

11. From the tracing below calculate the rate of breathing in breaths per minute.  

   SLO’s 1 and 3

   ![Respiration Tracing]

12. Define what is meant by each of the following terms.  

   A. Expiratory minute volume  
   B. Expiratory capacity

   SLO 1
13. In the experiment below explain physiologically why the potassium concentration in the urine is increasing, urine volume is decreasing and urine concentration is increasing. 
SLO’s 2 and 3

14. You are working in a clinical laboratory analyzing human urine from a male patient. You come across several samples that show the following characteristics. For each sample, state (A) what the results mean and (B) what is causing the response.

SLO’s 1 and 3

B. Color: yellow, SG: 1.020, pH 6.3, glucose: neg., blood: neg., ketones: 100mg/ml  
SLO’s 1 and 3

SLO’s 1 and 3

SLO’s 1 and 3

Student Learning Outcomes (SLO) #1: Physiological Principles, SLO#2 = Scientific Approach, SLO#3 = Creative and Critical Thinking.
15. How would you adjust the levels of the hormones aldosterone and antidiuretic hormone if you wanted to maximize sodium reabsorption but do not want to increase the volume of blood by reabsorbing water from the filtrate?  
   SLO’s 1, 2 and 3

16. A pharmaceutical company claims to have developed a drug to cure insomnia. The company employs you to test the drug to see if it is equally effective in males and female patients. The company gives you ample supplies of a placebo, the drug they manufactured and 15 patients. They ask you to design an experiment to test the effectiveness of the drug.

A. What sort of factors might you take into consideration when designing this experiment?  
   SLO 2

B. Describe in some detail how you would setup this experiment (i.e., how many groups, trials etc.).  
   SLO 2

C. How will you know (from your experimental design) if the drug is effective at curing insomnia? (Hint: what types of signs would you look for?)  
   SLO’s 1, 2 and 3

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