

Animal Physiology Laboratory Exam I Fall Semester 2007

Name: Cuong U

$$\frac{30 + \frac{20}{20}}{30} = \frac{50}{30}$$

$$\frac{93}{110} = 0.85$$

Multiple Choice: 2 points each

1. A short summary of the content including hypothesis, methodology, and results
- a. Title
 - b. Abstract
 - c. Introduction
 - d. Discussion

9

2. Primary literature ~~as opposed to secondary literature~~ is a compilation of articles used to quickly grasp current knowledge in a field of study.
- a. True
 - b. False

3. All of the following terms are used to summarize data except:
- ~~a. Mean~~
 - ~~b. Range~~
 - c. Level of Significance
 - ~~d. Standard Deviation~~

25%
 $0.75(90) + 0.25x \geq 90$

$$\begin{array}{r} 3 \\ 40 \\ 23 \\ \hline 110 \end{array}$$

Use the tables below to answer questions 4-6:

| Two Point Threshold for the Palmer Region (cm) | |
|--|-----|
| Human | Ape |
| 0.5 | 0.3 |
| 0.2 | 0.6 |
| 0.4 | 0.2 |
| 0.5 | 0.4 |
| 0.8 | 0.5 |

| t-Test: Paired Two Sample for Means | | |
|-------------------------------------|----------|-------|
| | Human | Ape |
| Mean | 0.48 | 0.4 |
| Variance | 0.047 | 0.025 |
| Observations | 5 | 5 |
| Pearson Correlation | -0.07293 | |
| Hypothesized Mean Difference | 0 | |
| df | 4 | |
| t Stat | 0.644658 | |
| P(T<=t) one-tail | 0.277129 | |
| t Critical one-tail | 2.131846 | |
| P(T<=t) two-tail | 0.554258 | |
| t Critical two-tail | 2.776451 | |

$$10 + \frac{10}{20} + 50 + 23 = 93$$

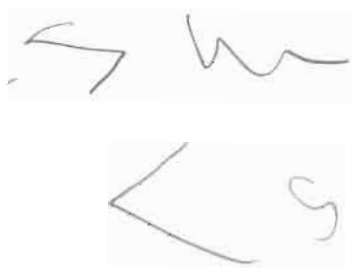
$$132 + 39 + x = 182$$

$$\frac{18}{200} \times 100 \geq 90$$

Lab 7 = 48

4. The t-statistic that best matches one you would calculate is 0.644658 and the appropriate critical t value you would compare it to 2.776451.

- a. 0.644658, 0.277129
- ~~b. 2.131846, 0.554258~~
- c. 0.644658, 2.776451
- ~~d. 0.277129, 0.554258~~



5. Is there a significant difference between the two species?

- a. Yes
- b. No

6. Which of the following represent the best conclusion?

- a. There is no significant difference between the two point threshold for humans and apes ✓
- b. There is significant difference between the two point threshold for humans and apes
- c. Humans evolved from apes
- d. Humans and apes have the same cutaneous receptors

7. The gastrocnemius muscle is _____ to the main mass of the frog's body.

- a. Internal
- b. Proximal
- c. Distal
- d. The frog does not have a gastrocnemius muscle

8. Which term best describes the clustering of cutaneous receptors at different points?

- a. Punctate Distribution
- b. Two Point Threshold
- c. Sensory Adaptation
- d. All of the above

9. Which of the following cutaneous receptors are encapsulated?

- a. Meissner's Corpuscle
- b. Follicular Corpuscle
- c. Merkel Cell (Merkel Disc)
- d. None of the above
- e. All of the above

10. Which answer best describes the movement of gases between the blood stream and the tissues

- a. Pulmonary Ventilation
- b. Pulmonary Gas Exchange
- c. Gas Transport
- d. Tissue/Blood Gas Exchange ✓
- e. Cellular Respiration

11. If you calculate the mean duration of each breathing cycle to be 2 seconds per breath, what is the breathing rate?

- a. 30 breaths per minute
- b. 120 breaths per minute
- c. 60 breaths per minute
- d. Not enough information is given

Handwritten calculations for question 11:

$$\frac{60 \text{ seconds}}{2 \text{ seconds}} = 30$$

30

12. According to Boyle's law:

- a. Air is pushed into the lungs by lower atmospheric pressure
- b. Ventilation results from a pressure difference between the pulmonary air and intra-thoracic air
- c. An increase in thoracic volume results in a decrease in intrapulmonary pressure ✓
- d. When thoracic volume increases the intrapulmonary pressure rises

13. All of the following statements regarding the neuromuscular junction are correct except:

- a. Acetylcholine transmits the nerve impulse across the synapse
- b. The depolarization of the muscle plasma membrane causes the release of ACh
- c. Influx of sodium ions are responsible for the muscle action potential
- d. Motor neurons innervate more than one muscle fiber

14. Which setting in the control panel of LabScribe would you change to find the maximum muscle action potential?

- a. Stimulus Amplitude (Amp)
- b. Pulse Width (W)
- c. Number of Pulses (N)
- d. None of the above

15. The nerve muscle prep was rinsed with Ringer's solution to:

- a. Prevent an electrical short in the nerve conduction chamber
- b. To record the stimulus artifact
- c. Replace sodium ions for action potential generation
- d. Prevent dessication of the nerve/muscle prep

Essay Questions

16. Define **FOUR** of the following terms (8 points total). If you define more I will randomly choose which four to grade.

1) Total Lung Capacity - the amount of gas in the lung after an maximum inhalation.

Vital Capacity (4800)

2) Tidal Volume (500) - the amount of gas that can be inspired and expired during a normal ventilation cycle.

Inspiratory Capacity (3800)

3) Inspiratory Reserve Volume (3300) - the maximum amount of gas that can be inhaled after a normal inhalation

4) Expiratory Reserve Volume (1000) - the maximum amount of gas that can be exhaled after a normal exhalation.

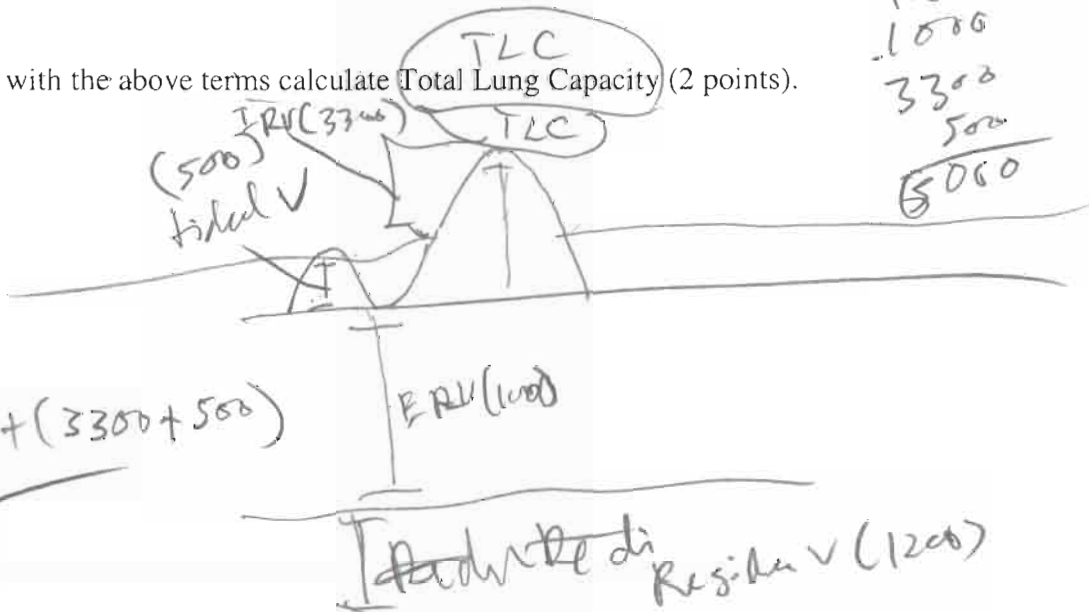
Functional Residual Capacity (2200)

Residual Volume (1200)

17

17. Based on the values listed with the above terms calculate Total Lung Capacity (2 points).

TLC =



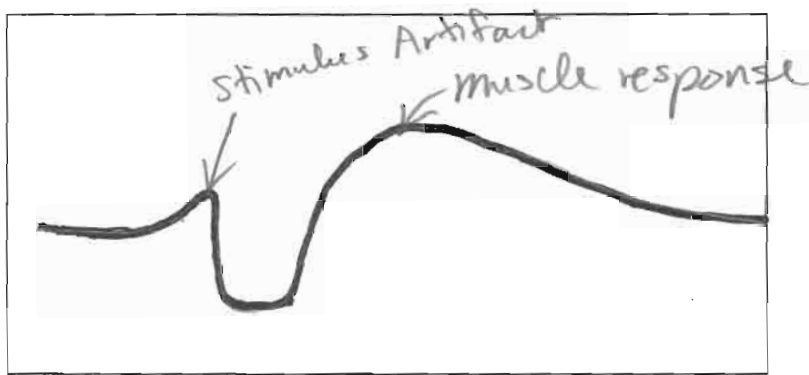
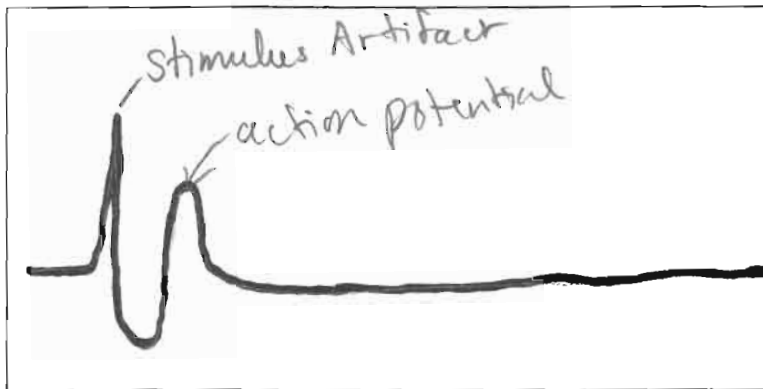
1200
-1000
3300
500

5000

$$\begin{aligned} \text{TLC} &= (1200) + (1000) + (3300 + 500) \\ &= \boxed{6000} \end{aligned}$$

The Diagram below is representative of the LabScribe Neuromuscular Response window; use this diagram to answer the following questions:

18. Please label the diagram with the following terms (each term may be used more than once) (3 points total): Action Potential, Muscle Response, and Stimulus Artifact.



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19. Define the following (2 points each):

Stimulus Artifact — the response that produce by the electrical stimulus by the researcher.

Action Potential — all or nothing change in the membrane potential.

20. What are the three mechanisms of contraction for striated muscles (3 points)?

1) electrical excitation

2) excitation-contraction coupling

3) Sliding of muscle filaments and contraction.

11/13/07
Tuesday

Name: Chang K

$\frac{28}{28} + \frac{18}{22} =$
 $\frac{178}{200} = 89\%$ 46

Multiple Choice: Each question is worth 2 points (28 points total for this section).

1. The main membrane channels responsible for action potentials

- A. Sodium and Calcium
- B. Sodium and G protein coupled receptors
- C. Sodium and Potassium
- D. Sodium and neuronal

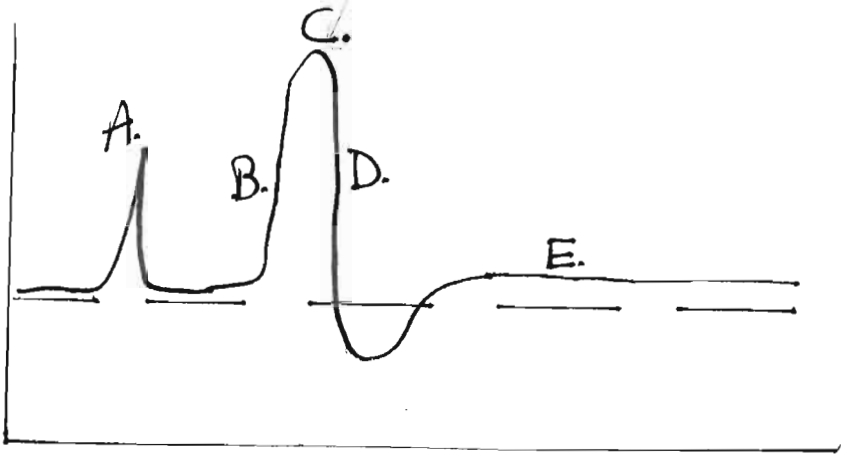
2. The maintenance of the resting membrane is a result of

- A. Equal distribution of negative and positive ions
- B. Unequal distribution of ions
- C. Higher concentration of Na^+ inside and higher concentration of K^+ outside the cell
- D. Higher concentration of Na^+ inside and higher concentration of Cl^- outside the cell
- E. None of the above

3. The equilibrium potential of a single ion is determined by

- A. Nernst equation
- B. Goldman equation
- C. Both A and B
- D. None of the above

Use the diagram below to answer questions 4 thru 6:



4. Action potential

- A.
- B.
- C.
- D.
- E.

5. Repolarization

- A.
- B.
- C.
- D.
- E.

6. Depolarization

- A.
- B.
- C.
- D.
- E.

7. The strength of the motor unit is a product of

- ~~A. Muscle size~~
- ~~B. Nerve Size~~
- C. Number of motor units recruited
- ~~D. Ratio of muscle fiber to muscle size~~

8. Which one of the following tests would use to measure grip strength

- ~~A. EEG~~
- B. EMG
- ~~C. ECG~~
- ~~D. EGG~~

9. On average, grip strength was greatest in the non-dominant arm.

- ~~A. True~~
- B. False

10. Innervation of the heart is necessary for the heart to maintain its rhythm.

- A. True
- B. False

11. The correct electrical pathway of the heart

- ~~A. Atrial ventricular node, sinoatrial node, bundle of His, purkenje fibers~~
- B. Sinoatrial node, atrial ventricular node, bundle of His, purkenje fibers
- ~~C. Atrial ventricular node, sinoatrial node, purkenje fibers, bundle of His,~~
- ~~D. Sinoatrial node Atrial ventricular node, purkenje fibers, bundle of His,~~

12. Heart rate post exercise is generally

- A. Increased
- ~~B. Decreased~~
- ~~C. Stays the same~~
- ~~D. Inverted~~

13. Blood pressure differences in men and women as they age

- ~~A. Increases for men but not women~~
- ~~B. Women always have higher blood pressure~~
- C. Is higher in men until age 60 when women have higher blood pressure
- ~~D. Is higher in women until age 60 when men have higher blood pressure~~
- ~~E. None of the above~~

14. Blood pressure is measured using which piece of equipment?

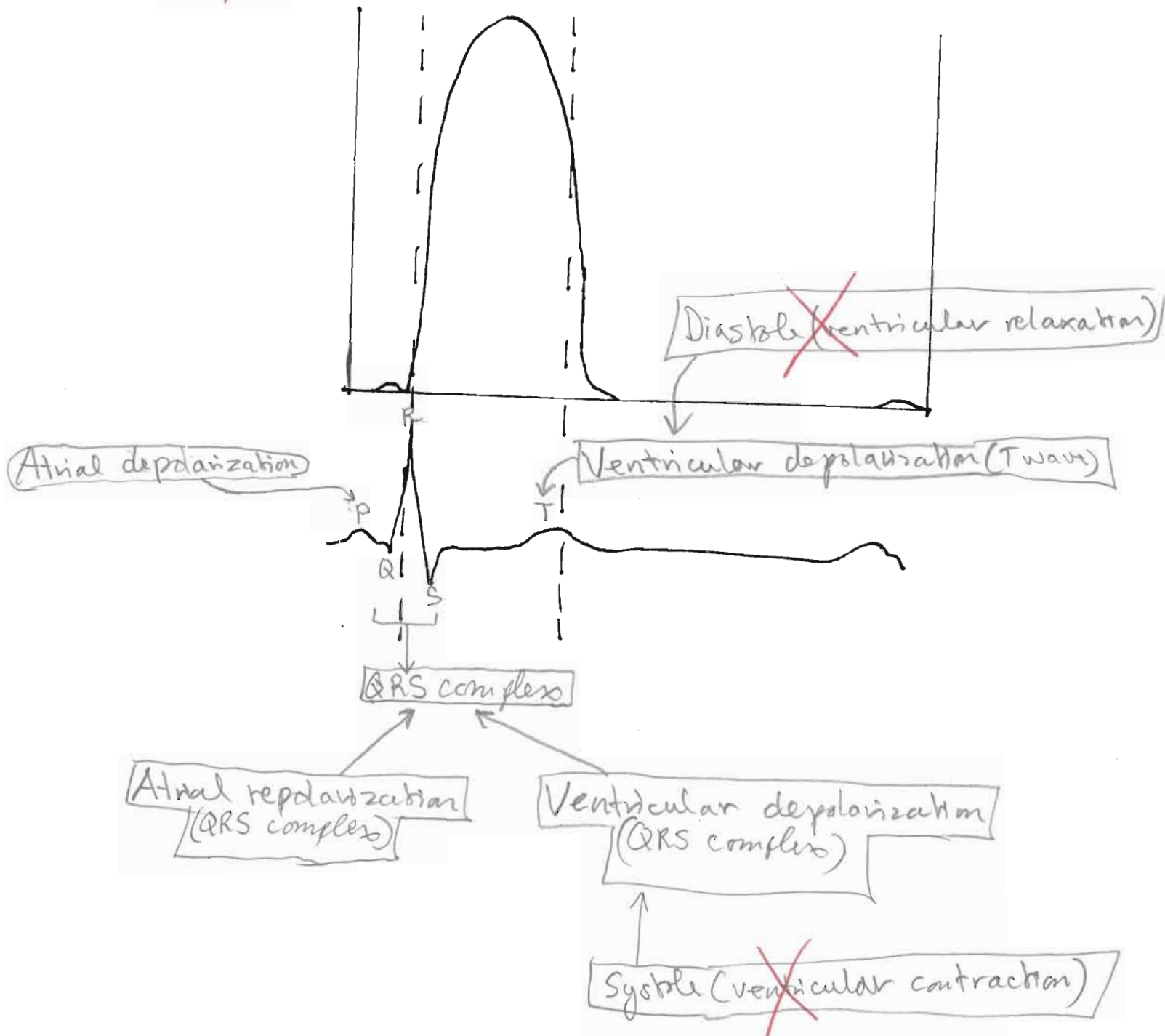
- ~~A. Hammer~~
- ~~B. Beaker~~
- ~~C. Wax~~
- D. Sphygmomanometer
- ~~E. None of the above~~

18/22

Essay Short Answer: 2 questions for a total of 22 points

12

1. Label the diagram below with the following terms (Please make sure you label clearly so I can give you every possible point ☺): P wave, QRS complex, T wave, Systole, Diastole, Atrial Depolarization, Atrial Repolarization, Ventricular Depolarization, Ventricular Repolarization (10 points)



2. Fill in the blanks (Please be specific with regards to phase sounds so that I can give you all the points possible). Each blank is worth 2 points.

2
1

| Phase | Sound | Cuff Pressure (range of Hg in mm) |
|---------|---|--------------------------------------|
| Phase 1 | A loudest sound compared to other phases. | 120-106 |
| Phase 2 | Murmurs | 105 - 85 |
| Phase 3 | Thumping | 84 - 82 |
| Phase 4 | Muffled | 81-76 |
| Phase 5 | none | 75 - below |

~~106~~
20
106
-20
86

105
-20
85
85