

Name: _____KEY_____

Date: _____

Quiz 4

Please circle the best response for each multiple-choice question. To earn full credit, **please answer each short answer question using complete sentences**. You can write on the back of the page as needed.

- 1) During inspiration, _____. (2 pts)
 - a. alveolar pressure exceeds atmospheric pressure
 - b. transpulmonary pressure increases
 - c. the diaphragm relaxes
 - d. intrapulmonary pressure is less than atmospheric pressure**
- 2) Read the statements about protein digestion and choose the incorrect statement. (2 pts)
 - a. If HCl was missing, the stomach could not perform the initial steps of protein digestion.
 - b. A medication that inhibits the formation of HCl would increase protein breakdown.**
 - c. The low pH provided by HCl secretion allows the activation of pepsin from pepsinogen.
 - d. Protein digestion could be impacted by disease of both the stomach and the pancreas.
- 3) Sertoli cells of the seminiferous tubules are stimulated by _____, while Leydig cells are stimulated by _____. (2 pts)
 - a. FSH; LH**
 - b. LH; FSH
 - c. testosterone; LH
 - d. FSH; testosterone
- 4) Explain two factors that affect oxygen binding to hemoglobin and how these factors could shift an oxygen dissociation curve. (4 pts)

P_{O_2} : increasing levels leads to increased oxygen binding to hemoglobin; curve shifts left

P_{CO_2} : increasing levels leads to decreased oxygen binding to hemoglobin; curve shifts right

pH: decreasing pH leads to decreased oxygen binding to hemoglobin; curve shifts right (opposite for increasing pH levels)

temperature: increasing temp leads to decreased oxygen binding to hemoglobin; curve shifts right

2,3-DPG: increasing levels stabilize deoxygenated hemoglobin; curve shifts right

- 5) Gastric function involves three key phases of regulation. Choose two of these phases and describe the processes taking place. (4 pts)

Cephalic phase: brain and vagus nerves stimulate ECL cells to release histamine that targets parietal cells for HCl release.

Gastric phase: Stomach distension following meal and presences of amino acids triggers gastrin secretion from G-cells that targets ECL cells to release histamine that targets parietal cells to release HCl. Positive feedback leads to more HCl. As pH drops, somatostatin is released, inhibiting gastrin secretion, reducing the HCl secretion from parietal cells.

Intestinal phase: stretch of the duodenum stimulates a neural reflex that inhibits gastric secretions via the vagus nerve. Fats in the chyme of the duodenum stimulates release of enterogastrone that inhibits gastric function.

- 6) Describe the hypothalamo-pituitary-gonadal axis and how its function is regulated by negative feedback. You can use either the male or female hormone axis in your answer. You are welcome to draw a diagram or flow chart to illustrate your answer but be sure to explain any drawings. (6 pts)

The hypothalamus produces GnRH that targets the anterior pituitary.

The anterior pituitary produces gonadotropins, FSH and LH that target the gonads. FSH stimulates gametogenesis, and LH stimulates production of gonadal hormones.

Sertoli cells (male) or granulosa cells (female) produce inhibin that reduces production of FSH.

Gonadal hormones (testosterone in males or estradiol and progesterone in females) feeds back to reduce GnRH from the hypothalamus and reduce receptivity of the anterior pituitary to GnRH.