

**VSC 401/501**  
**Exam 4**

Name: \_\_\_\_\_

1. The functional unit of the kidney is the
  - a. Ureter
  - b. Nephron
  - c. Bladder
  - d. Urethra
  
2. The 3 main functions of the functional unit of the kidney are  
\_\_\_\_\_
  
3. Which of the following is an endocrine gland?
  - a. hypothalamus
  - b. pancreas
  - c. thyroid
  - d. ovaries
  
4. Why are hormones very effective at low levels?
  - a. Because hormones have target cells
  - b. Because hormones use receptors
  - c. Because hormones talk real nice to the various parts of your body
  - d. Because hormones party a lot and are really popular
  
5. A local hormone that acts on neighboring cells is called a
  - a. paracrine
  - b. autocrine
  - c. steroid
  - d. circulating hormone
  
6. These hormones are primarily local in nature and are derived from arachidonic acid.
  - a. biogenic amines
  - b. peptides and proteins
  - c. steroids
  - d. eicosanoids



7. In the second messenger system, the hormone serves as the first messenger and the receptor is on the plasma membrane of the target cell. Which of the following is the correct order of events once the hormone binds the receptor?
- activated protein kinases, cAMP, G-proteins, adenylate cyclase, phosphodiesterase
  - cAMP, activated protein kinases, phosphodiesterase, G-proteins, adenylate cyclase
  - G-proteins, adenylate cyclase, cAMP, activated protein kinases phosphodiesterase
  - G-proteins, cAMP, adenylate cyclase, activated protein kinases, phosphodiesterase
8. The effect of one hormone on a target cell requires a previous or simultaneous exposure to another hormone. This is called the \_\_\_\_\_ effect.
- permissive
  - synergistic
  - antagonistic
  - protagonistic
9. On your 21<sup>st</sup> birthday, your friends took you out to celebrate. However, you were not the designated driver and imbibed too many alcoholic beverages. The next morning you woke up with a pounding head and dry mouth. What hormone was not able to do its job that night?
- aldosterone
  - adrenocorticotropin hormone
  - antidiuretic hormone
  - alliwanttodoisdie hormone
10. I am having a difficult time falling asleep at night. What hormone should I try taking before I go to bed?
- melatonin
  - melanin
  - melanocyte stimulating hormone
  - melon

11. Bugs Bunny is about to encounter the Tasmanian Devil. This would stimulate his “fight or flight” reflex. Which group of hormones would be responsible for mobilizing energy stores to enable Bugs to get away from the Devil?

- a. ACTH (adrenocorticotropin hormone)
- b. Mineralocorticoids
- c. Gonadocorticoids
- d. Glucocorticoids

12. Use the following words to fill in the blanks of the following:

Renin	Angiotensin II	Angiotensin I
Angiotensinogen	Juxtaglomerular cells	ACE
aldosterone	adrenal cortex	

Bugs Bunny has had to run a long time from the Devil and has become dehydrated. This has caused a decrease in blood volume, which leads to a decrease in blood pressure. As a result the \_\_\_\_\_ of the kidney release \_\_\_\_\_. This causes the conversion of \_\_\_\_\_ to \_\_\_\_\_, which then goes to the lungs and is converted by \_\_\_\_\_ into \_\_\_\_\_. This activator now goes to the \_\_\_\_\_ to stimulate the release of \_\_\_\_\_, which helps to increase water retention.

13. Which hormone helps to regulate calcium levels by increasing bone calcium.

- a. parathyroid hormone (PTH)
- b. calcitrol
- c. calcitonin (CT)
- d. insulin

14. The adrenal medulla secretes

- a. catecholamines
- b. glucocorticoids
- c. androgens
- d. mineralocorticoids



15. Lipid-soluble hormones can pass through the plasma membrane and bind their appropriate receptor. This receptor is

- a. in the nucleus
- b. in the mitochondria
- c. on the ribosomes
- d. in a vesicle

16. The \_\_\_\_\_ gland is the only endocrine gland that stores its secretory product in large quantities that normally last about 100 days.

17. Gonadotropin releasing hormone (GnRH)

- a. is a hypothalamic hormone
- b. causes the anterior pituitary to release FSH
- c. causes the anterior pituitary to release LH
- d. all of these look right

18. Name the two hormones stored by the posterior pituitary.

\_\_\_\_\_

19. Two components of the nephron are

- a. renal corpuscle and renal tubules
- b. renal pyramids and renal cortex
- c. renal corpuscle and renal pyramids
- d. renal pyramids and King Tut

20. Which structure is not a part of the renal tubule?

- a. proximal convoluted tubule
- b. distal convoluted tubule
- c. Henle's loop
- d. Glomeruli

21. Within the nephron lies the juxtaglomerular apparatus, which houses the macula densa. The purpose of the macula densa is to

- a. monitor blood pressure
- b. monitor salt
- c. excrete potassium
- d. reabsorb calcium

22. Which substance, when administered is an indicator of GFR?

- a. insulin
- b. inulin
- c. glucagons
- d. what the heck is GFR?

23. Which of the following is useful in evaluating the effectiveness of the kidney?

- a. BUN test
- b. plasma creatinine
- c. renal plasma clearance
- d. all of these

24. The word micturition refers to

- a. microorganisms in urine
- b. colloid particles in urine
- c. urination
- d. genuflection

25. Which of the following is not a waste elimination route.

- a. kidneys
- b. lungs
- c. skin
- d. gosh, these all look right

26. A toxic level of urea in the blood is termed

- a. acidosis
- b. proteinosis
- c. uremia
- d. anemia

27. What is the function of the counter-current mechanism? Draw a picture if it helps. (5 pts)



28. The descending loop of Henle goes into the
- renal cortex
  - renal medulla
  - glomerulus
  - bladder
29. The movement of water and solutes back into the blood is called
- glomerular filtration
  - tubular filtration
  - glomerular reabsorption
  - tubular reabsorption
30. Tubular secretion is responsible for
- removing materials from the blood and adding them to the filtrate
  - ridding the body of certain materials
  - helping to control the blood ph
  - once again, all of these look familiar and right
31. Sex differentiation takes place at conception. Assuming that at conception, a sperm cell containing an X chromosome entered the ovum, the sex of the child would be
- male
  - female
  - hard to say
  - impossible to predict with this limited information
32. In the process of oogenesis, the cell division process used is called \_\_\_\_\_.
33. Sperm cells mature
- in the ejaculatory duct
  - in the epididymis
  - in the prostatic urethra
  - in the interstitial cells
34. The glans penis
- is covered by the prepuce
  - is at the distal end of the penis
  - is where circumcision takes place
  - all of these are true

35. The process that sperm cells undergo in the female reproductive tract that enables them to fertilize an ovum is called \_\_\_\_\_.

36. The area on the ovary once occupied by the ovulated follicle becomes

- a. a designated rest area from further activity
- b. a corpus holicum spoticum
- c. a corpus luteum
- d. a new follicle



37. The primary source of progesterone in the female is

- a. granulosa cells of developing follicles
- b. corpus albicans
- c. corpus luteum
- d. mammary gland

38. Briefly define and discuss the scrotum and its importance to sperm survival. (5 pts)

39. The tightly coiled tubes where sperm are produced are called the

- a. fallopian tubes
- b. seminiferous tubules
- c. renal tubules
- e. seismic tubules

40. The condition when one or both testicles do not descend into the scrotum is called

- a. cryptism
- b. cryptorchidism
- c. orchardism
- d. I don't think any of these are right

41. Draw and label a spermatozoa. Be sure to include: acrosome, head, midpiece, tail. (5pts)

42. Name the three accessory organs that produce seminal fluid.

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43. Erection of the penis is stimulated through the (sympathetic,parasympathetic) nervous system; ejaculation is controlled via the (sympathetic, parasympathetic) nervous system.

44. Rapid, mitotic cell division of a zygote is called

- a. polyzygotism
- b. cleavage
- c. bust
- d. leverage

45. Name the three primary germ layers.

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46. Another term for giving birth is called

- a. pain
- b. mild discomfort
- c. parturition
- d. I'm gonna get him back

47. During the first two months of gestation, the group of developing cells is called the \_\_\_\_\_. After two months of development, the developing group of cells is called a \_\_\_\_\_.

48. Why do we castrate male animals? (4 pts)

49. The period of sexual receptivity in a female animal is called

- a. Estrous
- b. Estrus
- c. Metestrus
- d. Proestrus

50. The period between diestrus and proestrus that is characterized by quiescence of the reproductive tract is called

- a. Metestrus
- b. Estrus
- c. Anestrus
- d. Estrous

51. Explain the differences between true polyestrous and season polyestrous cycles. (5 pts)

52. What are the differences between spontaneous and induced ovulators? (5pts)

53. Name the four embryonic membranes.

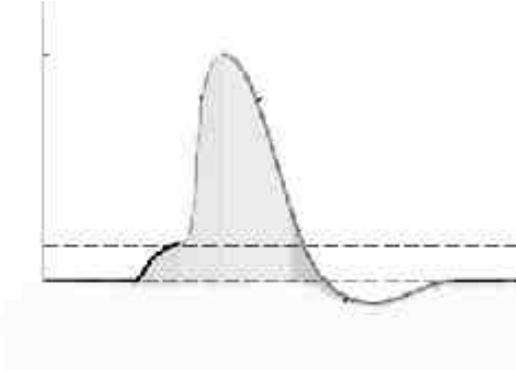
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54. Pick your favorite hormone and explain how it is controlled by negative feedback.(5pts)

55. What are the four main bone cells? What are the hormones that regulate blood calcium? How do the two work together to control blood calcium levels? (12 pts)

56. Describe the events of a generic action potential. (Remember, it usually starts with a stimulus) Then, using the graphs to assist you, compare the action potential of a nerve with the action potential within cardiac muscle. What is happening physiologically at each step? Be as complete as you can. How does cardiac muscle spontaneously contract? (20 pts)



57. What quick energy is available to muscle at the start of contraction? When this supply is exhausted, what other sources can be used for energy? How does this happen? How does the body replenish these sources? What hormones allow the catabolism and anabolism of these sources? (This answer should include info about muscle metabolism, energy metabolism, digestion, hormones associated with tissue uptake of nutrients, and hormones associated with tissue utilization of various nutrients.) (18 pts)

Thanks for being a great class. Have a wonderful Holiday and see you next semester!

**Extra Credit:**

Name either the 7 dwarfs, 8 reindeer (Rudolph does not count), or the 10 essential amino acids (3 points)

Discuss fatigue during exercise. Think about what limiting factors occur at the cardiovascular level, respiratory level and muscular level. A few hints to get you started: glucose, by-products, vital capacity, cardiac output, pH. (This one will take some thought) (Up to 10 points possible)