Zoology 120 - Human Anatomy
Final Lecture Exam
December 20, 2000

Name:

Instructions:

1. Write your name and the ID Number on the answer sheet

2. Block out the correct letter on the answer sheet after carefully reading the question. Use #2 or soft pencil to mark your answer sheet. When erasing, make sure the erasure is complete and clean, otherwise, the computer will mark you answer wrong.

3. Only one letter answer is correct per question.

4. There are a total of 100 questions, worth 2 points each, for a total of 200 points.

5. Do your own work!

6. You may keep the copy of the exam and pick up your final answer sheet at the beginning of next semester. After that time, all answer sheets will be recycled.

7. If you are interested in being considered for a TA position next fall, please fill out the Teaching Assistant Application form at the front desk. Read all of the instructions carefully before turning it in to the instructor.
1. What structure(s) in the kidney regulate blood pressure for filtration:
   a. juxtaglomerular cells
   b. macula densa
   c. juxtaglomerular apparatus
   d. proximal and distal convoluted tubules
   e. collecting ducts

2. Level of renin in the blood would increase when:
   a. more sodium is excreted in the urine
   b. blood pressure increases
   c. blood pressure decreases
   d. metabolic waste increases
   e. more urine is excreted

3. The main function of the proximal convoluted tubules is to:
   a. increase water content of the filtrate
   b. absorption of valuable nutrients from the filtrate
   c. add bicarbonate ions to the tubular fluid
   d. monitor NaCl concentration in the tubular fluid

4. Capillaries in the glomerulus of the kidney:
   a. reabsorb the filtrate
   b. are more permeable to filtrate due to presence pores or fenestrations
   c. have venous and arterial blood in them
   d. are similar to capillaries in the rest of the body

5. Which statement describes the glomerular filtrate correctly as it leaves the glomerulus?
   a. the filtrate contains everything that is normally found in blood
   b. the filtrate contains primarily metabolic waste
   c. the filtrate contains numerous nutrients, water, and electrolytes
   d. the filtrate contains primarily urine

6. Normally most filtered bicarbonate ions and glucose are:
   a. reabsorbed into the system by proximal convoluted tubules
   b. remain in the filtrate because the body already contains sufficient amounts of these chemicals
   c. are excreted into the filtrate in the distal convoluted tubule
   d. important for regulation of kidney blood pressure
   e. absorbed in the glomerulus
7. The permeability of the collecting ducts to water will increase if:
   a. aldosterone is absent
   b. aldosterone is present
   c. antidiuretic hormone (ADH) is lacking
   d. antidiuretic hormone (ADH) is present
   e. renin is secreted into the blood stream

8. How are the proximal convoluted tubules and the small intestine similar in their functions?
   a. they absorb nutrients
   b. they produce enzymes
   c. they eliminate waste products
   d. they are not similar in function at all

9. The forces that oppose filtration of substances from the glomerular capillaries into the glomerular (Bowman's) space include:
   a. capillary pressure
   b. blood osmotic pressure
   c. glomerular blood hydraulic pressure
   d. A and B
   e. all of the above

10. Testosterone is produced by:
    a. spermatozoa in the testes
    b. sustentacular (Sertoli) cells
    c. hypothalamus
    d. pituitary gland
    e. interstitial cells around the Seminiferous tubules

11. The acrosome of a sperm cell contains:
    a. 23 single chromosomes
    b. mitochondria for energy production
    c. testosterone
    d. hydrolytic enzymes for egg penetration
    e. the flagellum (tail)

12. During the menstrual cycle, LH is at its highest levels:
    a. at the time of menstruation
    b. just prior to ovulation
    c. just after ovulation
    d. just before menstruation begins
    e. levels of LH are constant
13. During the menstrual cycle, FSH would be at its highest levels:
   a. at the time of menstruation
   b. just prior to ovulation
   c. just after ovulation
   d. late in the postovulatory phase
   e. levels of FSH are constant during the menstrual cycle

14. When is the endometrium filled with most of the nutrient materials?
   a. during the menstrual phase
   b. just prior to ovulation during the proliferative phase
   c. just after ovulation during the secretory phase
   d. late in the postovulatory phase and just prior to menstruation
   e. nutrient levels in the endometrium do not change

15. What happens during the two meiotic divisions in the female and male reproductive organs?
   a. uterus proliferates and sperm number are increased
   b. the oocytes and spermatocytes undergo reduction of chromosome numbers
   c. capacitation for spermatocytes and maturation for the oocyte
   d. the oocyte and spermatocyte increase their chromosome numbers
   e. oocytes and spermatocytes degenerate

16. What major factors cause a portion of the uterine wall to be shed during the menstrual phase of the cycle?
   a. pregnancy
   b. lack of ovulation
   c. decreased levels of estrogen and progesterone
   d. decreased levels of human chorionic gonadotropins
   e. formation of corpus luteum

17. Which statement about the hormone inhibin is correct?
   a. this hormone is found in the pituitary gland of males
   b. this hormone is produced by both female and male reproductive organs
   c. inhibin stimulates spermatogenesis and oocyte production
   d. inhibin reduces the effects of estrogen and testosterone

18. Repair of the endometrium during the preovulatory phase of menstruation is due to rising levels of:
   a. FSH
   b. estrogen
   c. human chorionic gonadotropins
   d. progesterone
   e. inhibin
19. During the spermatogenesis, which cells exhibit mitotic divisions?
   a. spermatids
   b. secondary spermatocytes
   c. primary spermatocytes
   d. spermatogonia
   e. spermatozoa

20. What important function does pampiniform plexus perform?
   a. it stimulates production of sex hormones by both sexes
   b. it cools the testes temperature
   c. it supplies blood to ovaries and testes
   d. it induces production of male and female sex hormones
   e. it accelerates spermiogenesis in the seminiferous tubules

21. The first meiotic division of the oocyte occurs:
   a. at birth
   b. at fertilization
   c. following corpus luteum formation
   d. prior to ovulation
   e. before birth

22. Which hormone prepares the uterus for normal implantation?
   a. progesterone
   b. estrogen
   c. FSH
   d. LH
   e. human chorionic gonadotropins

23. Why is it important for the testes to descend into the scrotum?
   a. for protection
   b. so that a lower temperature can be maintained for spermatogenesis
   c. for increased temperature that is necessary for testosterone production
   d. so they are closer to other accessory reproductive organs
   e. none of the above

24. Which statement describes the correct mechanism by which the birth control pills and U-486 pills function in the female reproductive system?
   a. both pills inhibit ovulation
   b. birth control pills block uterus development, while U-486 prevents ovulation
   c. birth control pills induce premature ovulation, while U-486 delays ovulation
   d. birth control pills prevent ovulation, while U-486 blocks progesterone receptors in the uterus
   e. both pills prevent uterus development
25. Oxytocin is produced in the:
   a. anterior pituitary
   b. posterior pituitary
   c. uterus
   d. ovary
   e. hypothalamus

26. If fertilization and implantation occur, the corpus luteum:
   a. loses its function
   b. begins to secrete low levels of FSH and LH
   c. degenerates into the corpus albicans
   d. continues to secrete increased amounts of estrogen and progesterone
   e. both A and C are correct

27. The oocyte is fertilized in which region of the female reproductive tract?
   a. uterus
   b. it can be fertilized anywhere in the tract
   c. upper region of the uterine tube
   d. lower regions of the uterine tube next to uterus

28. Hormones secreted from the adenohypophysis are synthesized by the:
   a. neurons in the thalamus
   b. cells in the adenohypophysis
   c. neurons in the medulla
   d. cells in the hypothalamus

29. The primary target for prolactin is the:
   a. ovary
   b. hypothalamus
   c. adrenal cortex
   d. uterus
   e. mammary gland

30. Increasing the uptake of iodide by the thyroid gland and increasing the growth of the thyroid gland are two functions performed by the:
   a. TRH
   b. TSH
   c. hypothalamus
   d. thyroglobulin
   e. thyroxin
31. The main target for the growth hormone in the growing individual is the:
   a. entire body
   b. selected organs increase body size
   c. cartilage of developing bones
   d. adrenal cortex
   e. brain

32. Nerve impulses from the hypothalamus stimulate the release of hormones from the:
   a. anterior pituitary gland only
   b. posterior pituitary gland only
   c. thyroid gland
   d. adrenal cortex
   e. both the anterior and posterior pituitary gland

33. The primary effect of calcitonin is to:
   a. increase blood glucose
   b. decrease blood glucose
   c. increase excretion of calcium ions in urine
   d. increase blood calcium
   e. decrease blood calcium

34. The stimulus for release of parathyroid hormone is provided by:
   a. the input from the anterior pituitary
   b. low levels of calcium in the blood
   c. TSH (thyroid stimulating hormone)
   d. nerve impulses from the hypothalamus
   e. nerve impulses from the brain

35. The cell organelles responsible for protein synthesis and packing are the:
   a. Golgi complex and rough endoplasmic reticulum
   b. secretory granules
   c. mitochondria and Golgi complex
   d. rough and smooth endoplasmic reticulum

36. The net movement of molecules across cell membranes in most cells is due to:
   a. selectively permeable membrane and simple diffusion
   b. osmosis and active transport
   c. simple diffusion due to increased pressure
   d. active transport
37. Which epithelium type allows stretching of organs in the urinary system:
   a. transitional
   b. squamous
   c. stratified
   d. muscular
   e. elastic

38. What binds oxygen in the skeletal muscles?
   a. hemoglobin
   b. myoglobin
   c. creatine phosphate
   d. calmodulin
   e. calsequestrin

39. What shortens during muscular contraction?
   a. Z bands
   b. actin and myosin
   c. T tubules
   d. sarcomere
   e. sarcoplasmic reticulum

40. An inhibitory neurotransmitter would induce _____________ in the nerve fiber or neuron.
   a. depolarization
   b. hyperpolarization
   c. repolarization
   d. polarization

41. In a heart muscle, refractory period is _____________ in comparison to skeletal muscle?
   a. shorter
   b. longer
   c. about the same
   d. does not exist
   e. none of the above

42. For muscular contraction to cease, what must happen to acetylcholine?
   a. it must be inactivated
   b. it must be released in greater quantities
   c. it is absorbed back into the nerve terminal
   d. it is sequestered in sarcoplasmic reticulum
43. When the membrane potential of a neuron shifts from -70 mV to -55 mV, this is called:
   a. refractory period
   b. repolarization
   c. hyperpolarization
   d. resting state
   e. threshold level

44. Damage to the occipital lobe of the brain will cause:
   a. severe motor deficits
   b. severe sensory defects
   c. loss of spinal reflex activity
   d. severe visual deficits
   e. severe hearing deficits

45. The cerebrospinal fluid bathes the:
   a. spinal cord and brain
   b. cranial nerves and cranial bones
   c. venous sinuses in brain
   d. all of the above

46. Under normal conditions, plasma cells produce:
   a. blood clotting factors
   b. enzymes
   c. antibodies
   d. lysosomes

47. Injecting epinephrine into the heart musculature will have what specific effect on the heart:
   a. increased heart rate
   b. decreased heart rate
   c. induce abnormal rhythm
   d. increased blood flow

48. What chemical deactivates the neurotransmitter in the synaptic cleft of skeletal muscle?
   a. calmodulin
   b. calcium
   c. acetylcholinesterase
   d. acetylcholine
   e. calsequestrin
49. Which one of the following nerve fibers would conduct nerve impulses most slowly?
   a. large diameter, unmyelinated
   b. large diameter, myelinated
   c. small diameter, unmyelinated
   d. small diameter, myelinated

50. Which structure(s) are used for blood bypass in the fetal heart?
   a. ductus deferens
   b. ductus venosus
   c. ductus arteriosus
   d. all of the above

51. A resting neuron, i.e. not conducting an impulse:
   a. has a net positive charge outside the plasma membrane
   b. exhibits a difference in Na\(^+\) and K\(^+\) concentrations and electrical charge
      between inside and outside the plasma membrane
   c. exhibits active transport of Na\(^+\) out of the cell and K\(^+\) into the cell
   d. has a potential of about -70 mV
   e. all of the above are correct

52. The function of saliva is to:
   a. induce digestion of proteins and fats
   b. induce digestion of all food products in the mouth
   c. lubricate food for swallowing and initiate carbohydrate digestion
   d. inhibition of gastric secretion
   e. none of the above

53. The hormone gastrin is produced by which organ?
   a. small intestine
   b. large intestine
   c. stomach
   d. liver
   e. pancreas

54. Which gastrointestinal organ exhibits villi?
   a. large intestine
   b. small intestine
   c. stomach
   d. esophagus

55. The function of bicarbonate secretion into duodenum is to:
   a. stimulate gut motility
   b. improve absorption from intestines
   c. increase lubrication of intestinal lumen
   d. neutralize acidic chyme
56. Bile aids digestion by:
   a. chemical digestion of fats
   b. enzymatic digestion of fats
   c. emulsification of fats
   d. increasing fat absorption

57. Hydrochloric acid aids in digestion by:
   a. activating pepsinogen to pepsin
   b. decreasing stomach motility
   c. decreasing stomach emptying
   d. digesting fats

58. Pancreatic islet cells (islets of Langerhans) are responsible for?
   a. bicarbonate secretion
   b. production of the pancreatic enzymes
   c. production of hormone insulin and glucagon
   d. increased production of gastric juices

59. The hormone insulin is produced in order to:
   a. increase glucose absorption into body cells
   b. decrease glucose levels in different body cells
   c. increase glucose level in blood
   d. eliminate more glucose in urine

60. Bicarbonates that reach duodenum are produced in:
   a. stomach
   b. liver
   c. pancreas
   d. duodenal epithelium
   e. mouth

61. What is absorbed in the large intestine (colon)
   a. nothing
   b. water
   c. glucose
   d. fats
   e. enzymes

62. What does it indicate when lymphatic vessels that leave the small intestine are filled with white fluid or material:
   a. abnormal absorption of nutrients
   b. normal fat absorption
   c. abnormal liver function
   d. too much bile in the digestive organs
   e. normal bile duct filled with bile
63. The small intestine's role in nutrient absorption is:
   a. small, since it mainly absorbs water
   b. large, since it absorbs most food products
   c. small, since most absorption takes place in the stomach
   d. as important as that of the stomach

64. Cells such as neutrophils, microglia, monocytes all function to:
   a. increase secretory action of tissues
   b. increased anti-body production
   c. defend body against foreign substances
   d. all of the above
   e. none of the above

65. The most prevalent organelles present in macrophage cells are:
   a. lysosomes
   b. Golgi apparatus
   c. ribosomes
   d. endoplasmic reticulum
   e. nucleoli

66. Sodium transport is an example of:
   a. filtration
   b. dialysis
   c. osmosis
   d. active transport
   e. diffusion

67. Skull bones develop from a cartilage model. The rest of the bones develop through intramembranous ossification:
   a. the first sentence is true; the second sentence is false
   b. both sentences are false
   c. both sentences are true
   d. the first sentence is false; the second sentence is true

68. The developing bone increases in length by cell growth in:
   a. bone marrow
   b. ossification center
   c. blood vessel entrance
   d. epiphyseal plate
69. The important ion needed for contractions of the skeletal muscle is attached to ___________ and stored in ___________?
   a. T-tubules, sarcoplasm
   b. sarcoplasmic reticulum, sarcoplasm
   c. calcium, sarcoplasmic reticulum
   d. calsequestrin, sarcoplasmic reticulum
   e. synaptic cleft, T-tubules

70. Which of the following is a part of the respiratory system where gaseous exchange takes place?
   a. trachea
   b. bronchi
   c. alveoli
   d. terminal bronchiole

71. Surfactant functions by preventing:
   a. hyperventilation
   b. tracheal expansion
   c. fluid accumulation in lungs
   d. collapse of the alveoli

72. Which effects cause increased association of oxygen with hemoglobin?
   a. increased temperature
   b. decreased blood pH (more neutral)
   c. increased Po2
   d. all above

73. Damage to which tracts could result in the loss of voluntary motor movement, especially of the hands, fingers, feet, and toes:
   a. ventral spinothalamic
   b. lateral spinothalamic
   c. spinocerebellar (anterior)
   d. lateral corticospinal
   e. dorsal columns (fasciculus gracilis and cuneatus)

74. Thalamus is important because:
   a. all motor functions start here
   b. third order neurons of the sensory axons synapse here
   c. motor tract from cortex pass through here
   d. regulates cardiac and respiratory centers
   e. integrates and interprets voluntary responses
75. Ciliated epithelium functions by:
   a. increasing absorption
   b. moving substances across all surfaces
   c. secreting material
   d. none of the above

76. Ventricular depolarization corresponds to which of the following portions of the ECG?
   a. QRS complex
   b. P wave
   c. T wave
   d. P-T waves

77. The fossa ovales in the fetus:
   a. is an opening between the two ventricles prior to birth
   b. becomes an opening between the two atria prior to birth
   c. becomes a foramen ovale in the adult heart
   d. does not exist

78. Increased acidity of the blood due to increased carbon dioxide levels would be detected by:
   a. chemoreceptors in the lungs
   b. chemoreceptors in the brain
   c. chemoreceptors in the aorta and carotid arteries
   d. chemoreceptors in the heart
   e. pressure receptors in the blood vessels

79. Cerebellum of the brain would function:
   a. as a relay center for all sensory information
   b. as a center for equilibrium and balance
   c. as an area for skilled motor functions
   d. as a site of origin of the autonomic functions of the body

80. What word combination concerning different structures or their functions is correct?
   a. gap junctions – skeletal muscles
   b. oligodendrocytes – myelination of axons
   c. cilia - absorption
   d. emulsification of fats - stomach

81. Which statement correctly describes the cells of the body?
   a. all cells have a similar number of organelles
   b. all cells in the human body have nuclei
   c. differentiation of cells specializes the cells for specific functions
   d. all cells in the body function as individuals
82. Which statement describes the organs correctly?
   a. an organ consists of different tissue types
   b. organs consist of only highly specialized cells
   c. organs do not have tissues
   d. different tissue types are not present in an organ

83. Which cell type is not found in the connective tissue:
   a. neutrophils
   b. basophils
   c. eosinophils
   d. macrophages
   e. all of the above are found in the connective tissue

84. Which important rule or criterion governs muscle contraction and nerve stimulation?
   a. all or none law
   b. the nerve and muscle can respond to any stimulation
   c. no rule governs muscle contraction or nerve conduction (stimulation)
   d. muscle responds to all stimuli while nerve only to strong stimuli

85. What causes the striations in skeletal and cardiac muscles?
   a. muscle fatigue
   b. actin and myosin
   c. muscle fibers
   d. connective tissue
   e. nerve innervations

86. Where are the integral proteins found in the cells?
   a. cytoplasm
   b. organelles
   c. receptors
   d. cell membrane
   e. desmosomes

87. Which of the following is (are) a characteristic(s) feature(s) of the cell membrane?
   a. contains receptors
   b. contains transport (carrier) molecules
   c. shows selective permeability
   d. all of the above

88. What relaxes the sarcomere in a skeletal muscle?
   a. removal of calcium from sarcomere
   b. increase of calcium in sarcomere
   c. inactivation of acetylcholinesterase
   d. increased amounts of acetylcholine
   e. formation of actin-myosin complex
89. Which reflex is normally exhibited during pain avoidance?
   a. flexor-withdrawal reflex
   b. stretch reflex
   c. crossed-extensor reflex
   d. monosynaptic reflex

90. Which major organs are bypassed for the most part in fetal circulation?
   a. liver
   b. lungs
   c. heart
   d. brain
   e. a and b

91. The microvilli enzymes are found on cells in which organ?
   a. liver
   b. stomach
   c. colon
   d. small intestine
   e. pancreas

92. Where are megakaryocytes found and what do they produce?
   a. blood, plasma cells
   b. bone marrow, red blood cells
   c. connective tissue, fibers
   d. blood, lymphocytes
   e. bone marrow, platelets

93. To what stimulus do you quickly adopt?
   a. smell
   b. sound
   c. touch
   d. pain
   e. all except d

94. Where is acetylcholinesterase found:
   a. in the motor end plate region
   b. sarcomere
   c. sarcoplasmic reticulum
   d. axon terminals

95. The contents of acrosome are similar to what cell organelle:
   a. lysosome
   b. Golgi complex
   c. nucleus
   d. mitochondria
   e. rough endoplasmic reticulum
96. Which endocrine gland(s) does(do) not directly respond to the releasing hormones of the pituitary gland?
   a. thyroid
   b. parathyroid
   c. adrenal
   d. all of the above

97. Blood does not clot if the following ion is absent:
   a. heparin
   b. calcium
   c. sodium
   d. potassium

98. Lungs recoil after respiration due to the:
   a. transitional epithelium
   b. elastic connective tissue fibers
   c. decreased atmosphere pressure
   d. lubricating fluid

99. Z lines are far apart in the sarcomere during?
   a. contraction
   b. muscle hypertrophy
   c. latent period
   d. muscle degeneration
   e. relaxation

100. Decreased function of the sustentacular (Sertoli) cells will most likely affect the:
    a. production of testosterone
    b. production of spermatogonia
    c. maturing spermatids
    d. accessory male reproductive organs