Clio Invitational
Anatomy and Physiology Event

Name _____
Team Number _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

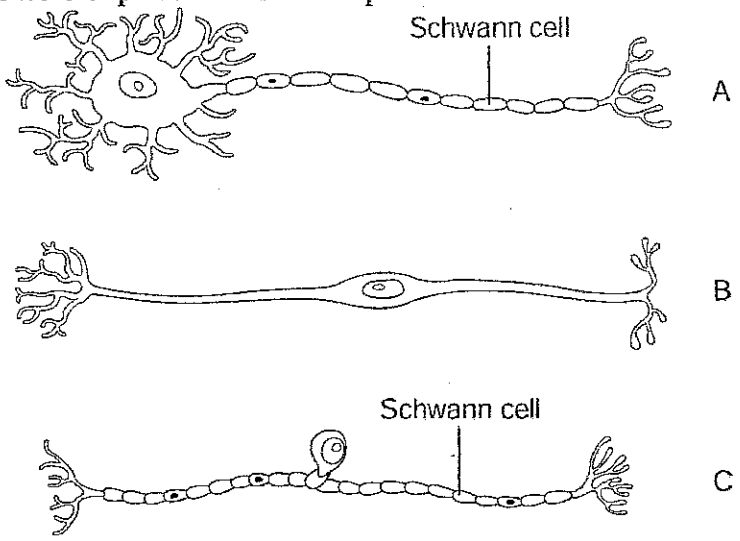


Figure 7.1

Using Figure 7.1, identify the following:

1) The most common structural classification of motor and association neurons is indicated by letter _____. 1) _____

2) A type of sensory neuron, such as those found in PNS gangila, is indicated by letter _____. 2) _____

3) The type of neuron that is rare in adults and is found in some special sense organs (like the eye and the ear) is indicated by letter _____. 3) _____

Fill in the blank or provide a short answer:

4) There are _____ cervical vertebrae and _____ pairs of cervical nerves. 4) _____

5) A _____ is a medical procedure used to assess the condition of the cerebral arteries serving the brain (or the carotid arteries serving the neck that feed most cerebral vessels). 5) _____

6. The term central nervous system refers to the:

A. autonomic and peripheral nervous systems
B. brain, spinal cord, and cranial nerves
C. brain and cranial nerves
D. spinal cord and spinal nerves
E. brain and spinal cord

7. Ciliated CNS neuroglia that line the cavities of the brain and spinal cord, and play an active role in moving the cerebrospinal fluid, are:

A. ependymal cells
B. Schwann cells
C. oligodendrocytes
D. astrocytes
E. microglia

8. Which one of the following is the part of a Schwann cell (mostly cytoplasm) that is external to the myelin sheath and forms a "neuron husk"?

A. Nissl substance
B. axolemma
C. neurilemma
D. white matter
E. gray matter

9. Which of the following is NOT a structural feature of a neuron, but plays a critical role as a functional junction between neurons?

A. synaptic cleft
B. cell body
C. dendrite
D. axon
E. node of Ranvier

10. The neuron processes that normally receive incoming stimuli are called:

A. axons
B. dendrites
C. neurolemmas
D. Schwann cells
E. satellite cells

11. Small collections of nerve cell bodies found in a small number of locations outside the central nervous system are:

A. nuclei
B. nerves
C. ganglia
D. tracts
E. neuroglia

12. Which one of the following best describes the waxy-appearing material called myelin:

A. an outer membrane on a neuroglial cell
B. a lipid-protein (lipoprotein) cell membrane on the outside of axons
C. a mass of white lipid material that surrounds the cell body of a neuron
D. a mass of white lipid material that insulates the axon of a neuron
E. a mass of white lipid material that surrounds the dendrites of a neuron

13. Which one of the following is a sensory receptor sensitive to deep pressure

A. naked nerve endings
B. Pacinian corpuscles
C. Golgi tendon organs
D. Meissner's corpuscles
E. muscle spindles

14. A neuron with a cell body located in the CNS whose primary function is connecting other neurons is called a (n):

A. efferent neuron
B. afferent neuron
C. association neuron
D. glial cell
E. satellite cell

15. A myelinated nerve fiber is characterized as being _____, whereas an unmyelinated nerve fiber is characterized as being _____.

A. gray, and composes the gray matter of the brain and spinal cord; white, and composes the white matter of the brain and spinal cord
B. gray, and composes the white matter of the brain and spinal cord; white, and composes the gray matter of the brain and spinal cord
C. white, and composes the white matter of the brain and spinal cord; gray, and composes the gray matter of the brain and spinal cord
D. unique to the spinal cord; unique to the brain
E. unique to the brain; unique to the spinal cord

16. Impulse conduction is fastest in neurons that are:

A. myelinated
B. unmyelinated
C. sensory
D. motor
E. cerebral

17. Bipolar neurons are commonly:

A. motor neurons
B. called neuroglia
C. found in ganglia
D. found in the eye and nose
E. more abundant in adults than in children

18. An action potential:

A. is essential for nerve impulse propagation
B. involves the influx of negative ions to depolarize the membrane
C. involves the outflux of negative ions to depolarize the membrane
D. involves the outflux of positive ions to depolarize the membrane
E. is initiated by potassium ion movements

19. Immediately after an action potential is propagated, which one of the following ions rapidly diffuses out of the cell into the tissue fluid?

A. odium
B. chloride
C. calcium
D. potassium
E. magnesium

20. Which one of the following describes how the interior surface of a cell membrane of a polarized neuron differs from the external environment? The interior is:

A. positively charged and contains less sodium
B. negatively charged and contains less sodium
C. negatively charged and contains more sodium
D. positively charged and contains more sodium
E. neutral and contains the same amount of sodium

21. Which one of the following describes how the interior surface of a cell membrane of a depolarized neuron differs from?

A. positively charged and contains less sodium
B. negatively charged and contains less sodium
C. negatively charged and contains more sodium
D. positively charged and contains more sodium
E. neutral and contains the same amount of sodium

22. When a nerve fiber is polarized, the concentration of:

A. sodium and potassium ions is higher on the inside of its membrane
B. sodium and potassium ions is higher on the outside of its membrane
C. sodium ions is higher on the inside of its membrane and potassium is higher on the outside
D. sodium ions is higher on the outside of its membrane and potassium is higher on the inside
E. sodium and potassium ions are in equal concentrations on the inside and outside of the membrane

23. Which one of the following is the correct sequence of events that follows a threshold potential?

1. the membrane becomes depolarized
2. sodium channels open and sodium ions diffuse inward
3. the membrane becomes repolarized
4. potassium channels open and potassium ions diffuse outward while sodium is actively transported out of the cell

A. 3, 2, 4, 1
B. 2, 1, 4, 3
C. 2, 1, 3, 4
D. 1, 2, 4, 3
E. 4, 1, 3, 2

24. Which one of the following describes saltatory conduction?

A. occurs only if the myelin sheath is continuous
B. occurs only if nodes of Ranvier are lacking
C. occurs only in the absence of axon hillocks
D. is faster than conduction on an unmyelinated fiber
E. is slower than conduction on an unmyelinated fiber

25. The point at which an impulse from one nerve cell is communicated to another nerve cell is the:

A. cell body
B. synapse
C. receptor
D. effector
E. collateral branch

26. The substance that is released at axonal endings to propagate a nervous impulse is called:

A. an ion
B. nerve glue
C. a neurotransmitter
D. the sodium-potassium pump
E. an action potential

27. Which of the following is the correct sequence in a typical reflex arc?

A. effector, afferent neuron, integration center, efferent neuron, receptor
B. receptor, afferent neuron, integration center, efferent neuron, effector
C. effector, efferent neuron, integration center, afferent neuron, receptor
D. receptor, efferent neuron, integration center, afferent neuron, effector
E. receptor, afferent neuron, efferent neuron, integration center, effector

28. The three major parts of the brain stem are the:

A. cerebrum, cerebellum, and diencephalon
B. thalamus, epithalamus, and hypothalamus
C. dura mater, arachnoid mater, and pia mater
D. midbrain, pons, and medulla oblongata
E. basal nuclei, pineal body, and choroid plexus

29. A shallow groove located on the surface of the cerebral cortex is called a:

A. fissure
B. gyrus
C. furrow
D. tract
E. sulcus

30. The single, deep groove separating the two cerebral hemispheres is the:

A. central sulcus
B. parieto-occipital sulcus
C. longitudinal fissure
D. lateral sulcus
E. anterior commissure

31. Elevated ridges located on the surface of the cerebral hemispheres are called:

A. ganglia
B. fissures
C. gyri
D. sulci
E. white matter

32. Lobe that contains the primary motor area that enables voluntary control of skeletal muscle movements:

A. parietal lobe
B. temporal lobe
C. occipital lobe
D. frontal lobe
E. diencephalon

33. If the specialized area of the cerebral hemisphere corresponding to Broca's area is damaged, what is the result?

A. memory is lost
B. motor control of the right leg is impaired
C. eyesight is lost
D. motor control of the speech muscles is lost
E. hearing is impaired

34. Parkinson's disease and Huntington's disease result from degeneration of the:

A. frontal lobe
B. parietal lobe
C. temporal lobe
D. basal ganglia
E. ventricles

35. The area of the brain stem that plays a role in consciousness and the awake/sleep cycles is the:

A. thalamus
B. reticular activating system (RAS)
C. pineal body
D. limbic system
E. cerebellum

36. Control of temperature, endocrine activity, metabolism, and thirst are functions associated with the:

A. medulla oblongata
B. cerebellum
C. hypothalamus
D. thalamus
E. cerebrum

37. The vital centers for the control of visceral activities such as heart rate, breathing, blood pressure, swallowing, and vomiting are located in the:

A. pons
B. medulla oblongata
C. midbrain
D. cerebrum
E. hypothalamus

38. The hypothalamus:

A. is the thermostat of the body since it regulates body temperature
B. is an important auditory and visual relay center
C. is the somatic sensory area
D. mediates sensations
E. contains reflex centers involved with vision and hearing

39. Which one of the following represents the correct sequence from outermost to innermost layers of the meninges?

A. pia mater, dura mater, arachnoid mater
B. pia mater, arachnoid mater, dura mater
C. arachnoid mater, dura mater, pia mater
D. dura mater, pia mater, arachnoid mater
E. dura mater, arachnoid mater, pia mater

40. The cerebrospinal fluid:

A. is secreted by the arachnoid villi
B. enters the four ventricles after filling and circulating through the subarachnoid space
C. is secreted mostly by the ependymal cells lining the brain ventricles
D. is continually formed mostly by the choroid plexuses
E. is identical in composition to whole blood

41. Which one of the following is the correct sequence in connective tissue sheaths, going from outermost to innermost layer?

A. epineurium, endoneurium, perineurium
B. epineurium, perineurium, endoneurium
C. perineurium, epineurium, endoneurium
D. perineurium, endoneurium, epineurium
E. endoneurium, epineurium, perineurium

42. Afferent nerves are called _____, and motor nerves are called _____.

A. motor nerves; sensory nerves
B. peripheral nerves; cranial nerves
C. mixed nerves; motor nerves
D. sensory nerves; efferent nerves
E. cranial nerves; peripheral nerves

43. The functions of the vestibulocochlear nerves concern:

A. vision and hearing
B. smell and taste
C. hearing and balance
D. fine and gross motor control
E. digestive activity and swallowing

44. The nerve that contains motor fibers that are involved in chewing is:

A. cranial nerve III
B. cranial nerve IV
C. cranial nerve V
D. cranial nerve VI
E. cranial nerve VII

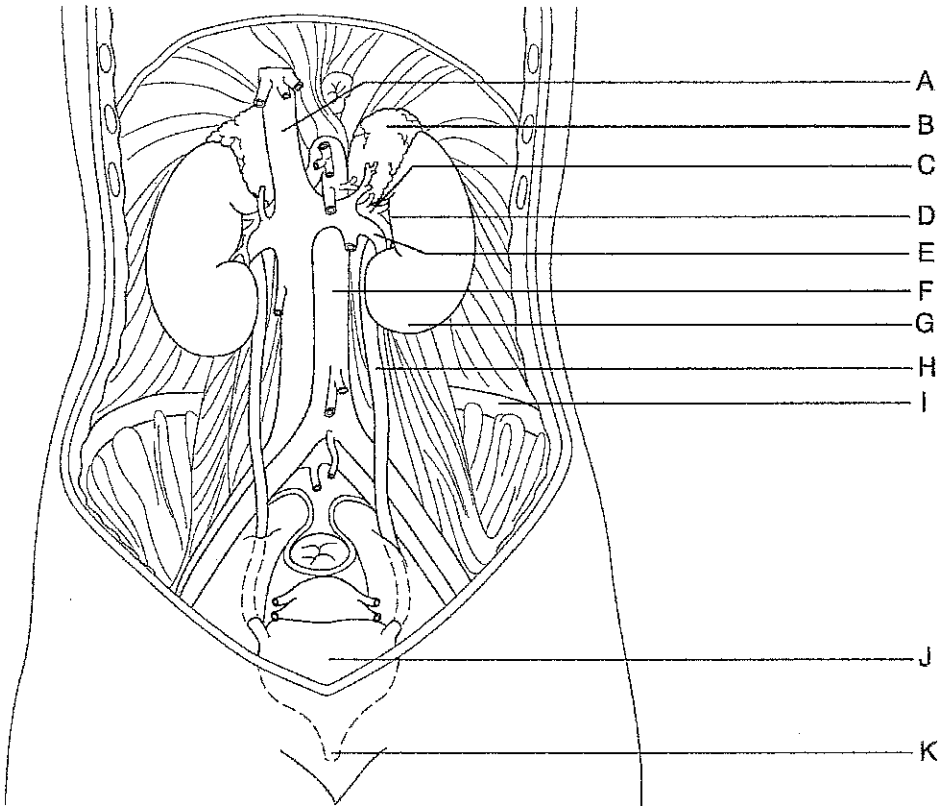
45. The sciatic nerve is the largest nerve in the body resulting from a combination of which two nerves:

A. pudendal and femoral nerves
B. femoral and tibial nerves
C. pudendal and common peroneal nerves
D. common fibular and tibial nerves
E. pudendal and tibial nerves

46. Preparing the body for the "fight-or-flight" response during threatening situations is the role of the:

A. sympathetic nervous system
B. cerebrum
C. parasympathetic nervous system
D. somatic nervous system
E. afferent nervous system

Use the diagram below to answer the following questions.



47. The left kidney is indicated by letter _____.

48. The renal hilus is indicated by letter _____.

49. The urethra is indicated by letter _____.

50. The inferior vena cava is indicated by letter _____.

51. The ureter is indicated by letter _____.

52. The renal artery is indicated by letter _____.

53. The aorta is indicated by letter _____.

54. The iliac crest is indicated by letter _____.

55. The adrenal gland is indicated by letter _____.

56. The urinary bladder is indicated by letter _____.

57. The renal vein is indicated by letter _____.

58. Which one of the following is NOT one of the functions of the kidneys?

A. manufacture urine
B. convert vitamin D from its inactive to its active form
C. dispose of metabolic waste products
D. produce hormones that assist in digestion
E. regulate blood volume

59. Which one of the following terms describes the location of the kidneys?

A. suprarenal
B. retroperineal
C. adrenal
D. intraperitoneal
E. retroperitoneal

60. The kidneys are aided in the excretion of fluids by the:

A. lungs
B. skin
C. hair
D. lungs and skin
E. skin and hair

61. The triangular regions of the kidneys that are striped in appearance and separated by the renal columns are the:

A. renal cortex
B. renal medulla
C. medullary pyramids
D. renal pelvis
E. calyces

62. Which one of the following represents the correct pathway of the arterial blood supply through the kidney?

A. renal artery, interlobar arteries, arcuate arteries, interlobular arteries
B. arcuate arteries, renal artery, interlobar arteries, interlobular arteries
C. interlobular arteries, arcuate arteries, renal artery, interlobar arteries
D. interlobar arteries, interlobular arteries, arcuate arteries, renal artery
E. renal artery, arcuate arteries, interlobular arteries, interlobar arteries

63. The enlarged, cup-shaped closed end of the renal tubule that completely surrounds the glomerulus is called the:

A. collecting duct
B. proximal convoluted tubule
C. loop of Henle
D. Bowman's capsule
E. distal convoluted tubule

64. The nonselective, passive process performed by the glomerulus that forms blood plasma without blood proteins is called:

A. absorption
B. secretion
C. filtration
D. tubular reabsorption
E. glomerular reabsorption

65. Which one of the following substances is normally found in urine?

A. blood proteins
B. red blood cells
C. hemoglobin
D. white blood cells
E. creatinine

66. Under normal healthy circumstances, adult urine has a specific gravity between:

A. 1.0 to 1.25
B. 0.75 to 1.25
C. 1.25 to 1.50
D. 1.001 to 1.035
E. 1.025 to 1.050

67. The main hormone that acts on the kidneys to regulate sodium ion concentration of the extracellular fluid (ECF) is:

A. ADH
B. renin
C. secretin
D. aldosterone
E. epinephrine

68. Which one of the following represents the correct order through which food passes in the alimentary canal?

A. mouth, pharynx, esophagus, stomach, large intestine, small intestine
B. mouth, esophagus, pharynx, stomach, small intestine, large intestine
C. pharynx, mouth, esophagus, stomach, large intestine, small intestine
D. mouth, pharynx, esophagus, stomach, small intestine, large intestine
E. mouth, pharynx, esophagus, small intestine, stomach, large intestine

69. When relaxed and stretched out, the average adult alimentary canal is approximately:

A. 10 feet long
B. 20 feet long
C. 30 feet long
D. 40 feet long
E. 50 feet long

70. Which one of the following is NOT a layer of the alimentary canal?

A. mucosa
B. submucosa
C. muscularis interna
D. muscularis externa
E. serosa

71. Intrinsic factor in digestion is a stomach secretion needed for absorption of _____ from the small intestine.

A. vitamin A
B. vitamin B12
C. vitamin C
D. vitamin D
E. vitamin K

72. Which one of the following is the middle section of the small intestine?

A. duodenum
B. ascending colon
C. jejunum
D. descending colon
E. ileum

73. The "gatekeeper" of the small intestine that regulates food movement into it is called the:

A. cardioesophageal sphincter
B. jejunum
C. pyloric sphincter
D. ileum
E. hepatopancreatic ampulla

74. The primary function of the small intestine is:

A. absorption of nutrients
B. absorption of water
C. waste secretion
D. vitamin conversion
E. mineral secretion

75. The chemical found within the stomach that is necessary to activate pepsinogen to pepsin is:

A. rennin
B. gastrin
C. secretin
D. hydrochloric acid
E. butyric acid

76. Which one of the following is NOT true of cholesterol?

A. it provides energy fuel for muscle contraction
B. it serves as the structural basis of steroid hormones
C. it serves as the structural basis of vitamin D
D. it is a major building block of plasma membranes
E. only about 15 percent comes from the diet

77. Adenosine triphosphate (ATP) is produced in greatest quantity during:

A. glycolysis
B. the Krebs cycle
C. protein metabolism
D. the electron transport chain
E. fat metabolism

78. The liver metabolizes fats for all of the following reasons EXCEPT:

A. ATP production
B. synthesis of lipoproteins
C. synthesis of thromboplastin
D. synthesis of vitamin K
E. synthesis of cholesterol

79. The hereditary inability of tissue cells to metabolize the amino acid phenylalanine, which can result in brain damage and retardation unless a special diet low in phenylalanine is followed, is called:

A. cystic fibrosis
B. cleft lip
C. cleft palate
D. phenylketonuria
E. tracheoesophageal fistula

80. Which one of the following alimentary segments has no digestive function?

A. stomach
B. ascending colon
C. ileum
D. esophagus
E. duodenum