

BMD 334
Human Physiology
Practice Exam 3
Sample 2a

Name _____

Student ID _____

There are 35 multiple choice questions. All answers must be recorded on the computer form to receive credit. Choose the one best answer. 2 points each.

1. **What type of glial cell is necessary for normal development of the blood brain barrier?**
 - A) astrocytes
 - B) oligodendrocytes
 - C) ependymal cells
 - D) microglia
 - E) Schwann cells

2. **What type of fibers are located in the dorsal roots?**
 - A) afferents
 - B) efferents
 - C) interneurons
 - D) A and B
 - E) All of the above

3. **What type of reflex occurred when Pavlov's dogs salivated in response to the ringing of a bell?**
 - A) conditioned
 - B) cranial
 - C) visceral
 - D) polysynaptic
 - E) All of the above

4. **Which of these brain structures, outside of the cortex, is NOT involved in assisting with motor programming and providing feedback on the execution of a motor program?**
 - A) cerebellum
 - B) thalamus
 - C) basal nuclei
 - D) hypothalamus
 - E) brainstem nuclei

5. **Parkinson's disease appears to target _____ cells within the _____.**
 - A) cholinergic : substantia nigra
 - B) adrenergic : substantia nigra
 - C) dopoaminergic : substantia nigra
 - D) adrenergic : red nuclei
 - E) cholinergic : red nuclei

6. **A person with aphasia would have which of the following symptoms?**
 - A) deafness
 - B) difficulty in communicating
 - C) intention tremors
 - D) inability to sleep
 - E) night sweats

7. **At rest, the brain accounts for how much of the oxygen consumption by the body?**
- A) 2%
 - B) 5%
 - C) 20%
 - D) 40%
 - E) 50%
8. **Which of the following is an example of a procedural memory?**
- A) learning the periodic table of the elements
 - B) learning to walk
 - C) learning somebody's name
 - D) A and C
 - E) All of the above
9. **The ability of the nervous system to alter its anatomy and function in response to changes in its activity pattern is called _____.**
- A) remembering
 - B) declaration
 - C) plasticity
 - D) consolidation
 - E) memorizing
10. **During long-term potentiation at glutamate synapses, _____.**
- A) the presynaptic cell releases more glutamate
 - B) the postsynaptic cell becomes more sensitive to glutamate
 - C) sodium channels and calcium channels on the postsynaptic cell open
 - D) A and C
 - E) All of the above
11. **In response to stepping on a nail, the crossed-extensor reflex causes _____.**
- A) flexion of the leg on the side of receptor activation
 - B) extension of the leg on the side of receptor activation
 - C) extension of the leg opposite the side of receptor activation
 - D) flexion of the leg opposite the side of receptor activation
 - E) None of the above
12. **A stroke occurring in the basal nuclei could produce which of the following symptoms?**
- A) loss of language comprehension
 - B) muscle rigidity
 - C) blindness or blurred vision
 - D) deafness
 - E) altered sleep-wake patterns
13. **Where is the auditory cortex?**
- A) frontal lobe
 - B) temporal lobe
 - C) occipital lobe
 - D) parietal lobe
 - E) diencephalon

14. **What fiber tract connects the left cerebrum with the right cerebrum?**
- A) corticospinal tract
 - B) optic radiations
 - C) corpus callosum
 - D) cauda equina
 - E) dorsal columns
15. **The efferent neurons that innervate skeletal muscle, and induce them to contract, originate from what region of the nervous system?**
- A) ventral horn of the spinal cord
 - B) dorsal horn of the spinal cord
 - C) primary motor cortex
 - D) basal nuclei
 - E) pyramidal tract
16. **What emotion drives addiction?**
- A) depression
 - B) anger
 - C) fear
 - D) pleasure
 - E) aggression
17. **The modality to which a receptor responds best is called the _____.**
- A) appropriate stimulus
 - B) appropriate modality
 - C) adequate stimulus
 - D) adequate modality
 - E) composite modality
18. **The larger the receptive fields in a region of the body, _____.**
- A) the smaller the two-point discrimination threshold
 - B) the larger the two-point discrimination threshold
 - C) the larger the area of somatosensory cortex devoted to that region
 - D) A and C
 - E) B and C
19. **Which of the following receptors responds to chemicals like histamine and bradykinin that are released from damaged tissue?**
- A) Ruffini's endings
 - B) hair follicle receptors
 - C) mechanical nociceptors
 - D) polymodal nociceptors
 - E) proprioceptors
20. **A person has damage to the right dorsal columns of the spinal cord at the thoracic level. This person would have impaired _____.**
- A) temperature sensation of the right leg
 - B) touch sensation of the right leg
 - C) pain sensation of the right arm and leg
 - D) temperature sensation of the left leg
 - E) touch sensation of the left leg

21. **Fast pain is perceived as a _____ pain and is transmitted along _____ fibers.**
- A) sharp : $A\delta$ (A delta)
 - B) sharp : $A\beta$ (A beta)
 - C) sharp : C
 - D) dull : $A\delta$ (A delta)
 - E) dull : C
22. **Which of the following is NOT part of the gate-control theory of pain modulation?**
- A) Inhibitory interneurons can modulate second-order pain neurons.
 - B) Inhibitory interneurons are activated by collaterals of $A\beta$ fibers that are associated with mechanical stimuli.
 - C) Inhibitory interneurons are inhibited by collaterals from the pain afferent.
 - D) A non-painful stimulus can activate the inhibitory interneuron and thereby inhibit the painful stimulus.
 - E) Signals that modify pain originate from the brainstem.
23. **What is the highly pigmented layer of tissue within the eye that absorbs light that has reached to back of the eye to prevent its reflection?**
- A) pupil
 - B) ciliary body
 - C) cornea
 - D) sclera
 - E) choroid
24. **The light-absorbing portion of the photopigment is _____; its sensitivity to a particular wavelength of light is determined by _____.**
- A) retinal : opsin
 - B) opsin : retinal
 - C) transducin : phosphodiesterase
 - D) phosphodiesterase : transducin
 - E) opsin : transducin
25. **In the absence of light, the membrane potential of a photoreceptor is relatively _____ by the presence of _____ channels.**
- A) depolarized : open potassium
 - B) depolarized : closed potassium
 - C) depolarized : open sodium
 - D) hyperpolarized : closed sodium
 - E) hyperpolarized : open calcium
26. **Which of the following is characteristic of ON-center, OFF-surround cells in the retina?**
- A) they are bipolar cells
 - B) they are ganglion cells
 - C) light in the center of the visual field increases the frequency of action potentials
 - D) A and C
 - E) B and C
27. **Which of the following parts of the visual pathway is 100% contralateral to the visual field?**
- A) visual cortex
 - B) optic nerve
 - C) optic radiations
 - D) A and C
 - E) B and C

28. **Both the auditory and vestibular systems rely upon _____ to detect movement of fluid within the ear.**
- A) hair cells
 - B) chemoreceptors
 - C) thermoreceptors
 - D) osmoreceptors
 - E) hair follicle receptors
29. **The organ of Corti is located on what membrane?**
- A) vestibular membrane
 - B) tympanic membrane
 - C) tectorial membrane
 - D) basilar membrane
 - E) all of the above
30. **Bending of the stereocilia on a hair cell can induce either a closure or an opening of a potassium channel based upon the _____.**
- A) size of the stereocilia
 - B) frequency of the bending of the stereocilia
 - C) amplitude of the bending of the stereocilia
 - D) direction that the stereocilia bend
 - E) rate that the stereocilia bend
31. **In comparison to high pitch sound, low pitch sound will cause vibrations of the basilar membrane _____.**
- A) of greater amplitude
 - B) of lesser amplitude
 - C) closer to the oval window
 - D) closer to the helicotrema
 - E) two of the above are true
32. **What type of movement does the saccule detect?**
- A) angular acceleration as when nodding the head yes
 - B) angular acceleration as when shaking the head no
 - C) angular acceleration as when tilting the head so that the ear approaches the shoulder
 - D) linear acceleration up or down
 - E) linear acceleration forward or backward
33. **Taste receptor cells can be depolarized by decreased outward flux of potassium by all of the following primary tastes except one. Which of the following is the exception?**
- A) bitter
 - B) sweet
 - C) sour
 - D) salty
34. **Which of the following is an INCORRECT match between cranial nerve and special sense?**
- A) cranial nerve I – olfaction
 - B) cranial nerve II – vision
 - C) cranial nerve III – taste
 - D) cranial nerve VIII – hearing
 - E) cranial nerve VIII - equilibrium

35. **Activation of the periaqueductal gray (PAG) activates the nucleus raphe magnus (NRM), which _____.**
- A) decreases the perception of pain
 - B) decreases substance P release in the spinal cord
 - C) produces an IPSP in the second-order neuron for pain
 - D) A and C
 - E) All of the above

Short Answer. Answer the following questions on the exam form. Answers must be legible to receive credit.

36. **(2 points) Fill in the blanks.**

Cerebrospinal fluid is produced within the _____ and is reabsorbed into the venous circulation by special structures called the _____.

37. **(4 points) Circle the correct word in parentheses to accurately complete the statement.**

Under parasympathetic stimulation, the ciliary muscles are (contracted / relaxed), the suspensory ligaments are (taut / loose), and the lens is relatively (flat / round) allowing the eye to focus on objects that are (near / far).

38. **(2 points) Fill in the blanks.**

First-order olfactory neurons synapse with second order neurons called _____ in clusters called _____.

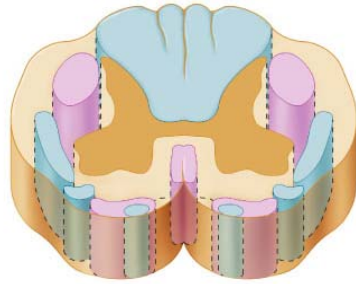
39. **(2 points) Fill in the blanks.**

The area on the retina where the optic nerve exits the eye is called the _____.

The area on the retina of greatest visual acuity is called the _____.

40. **(3 points) Name the three meninges in order from bone to neural tissue.**

41. (3 points) Label the structures identified in the figure below.

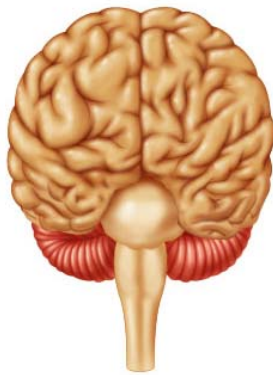


A) _____

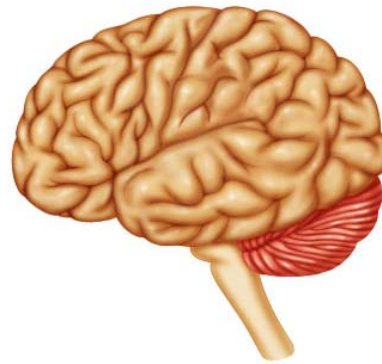
B) _____

C) _____

42. (3 points) Label the structures identified in the picture below.



(a)



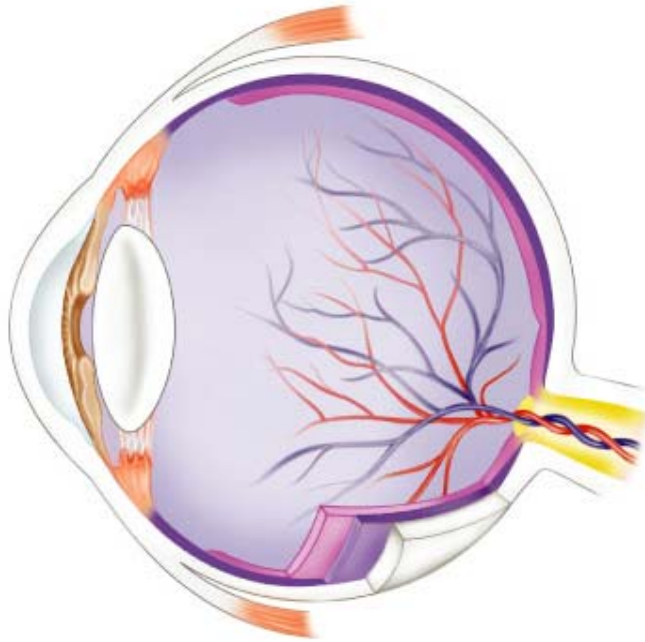
(b)

A) _____

B) _____

C) _____

43. (3 points) Label the structures identified in the figure below.



- A) _____
- B) _____
- C) _____

44. (2 points) Name the two subdivisions of the forebrain.

45. (3 points) Circle the correct word in parentheses to accurately complete the phrase.

In response to light, activation of the parasympathetic branch of the autonomic nervous system causes (contraction / relaxation) of the (circular / radial) muscles of the iris causing pupillary (dilation / constriction)

46. (3 points) Label the structures identified in the figure below.

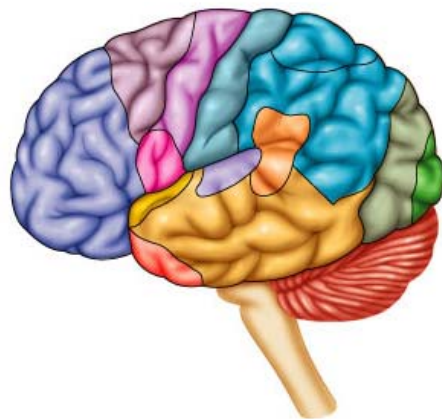


A) _____

B) _____

C) _____

BONUS: (3 points) Name a function associated with the areas indicated in the following figure.



A) _____

B) _____

C) _____