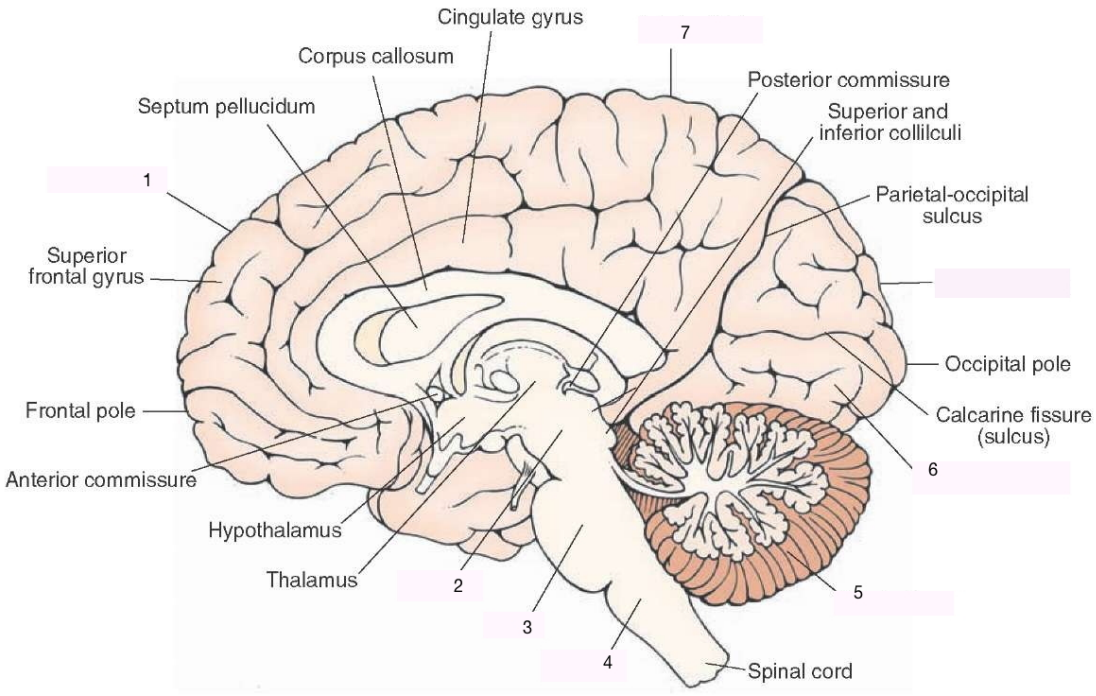
PSYCH 260H Exam 1

September 22, 2017

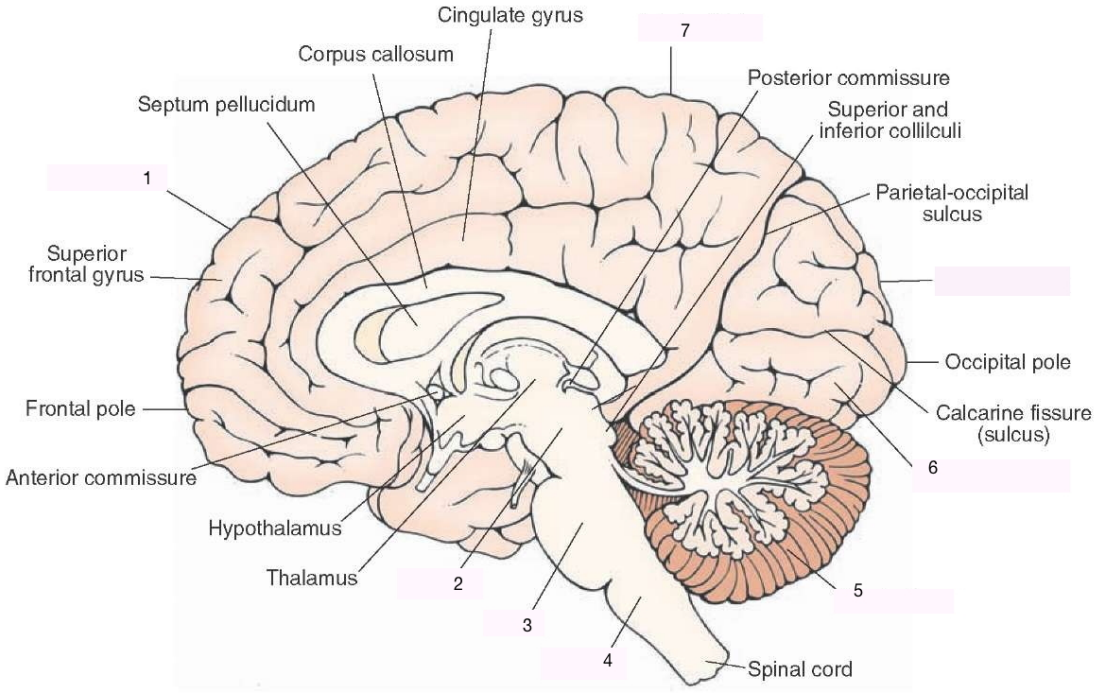
Answer the questions using the Scantron form.

Name: _____

1 Main



1. Identify the structure
   - **A. Frontal lobe**
   - B. Parietal lobe
   - C. Occipital lobe
   - D. Temporal lobe
2. Identify the structure
   - A. Forebrain
   - **B. Midbrain**
   - C. Hindbrain
   - D. Spinal cord
3. Identify the structure
   - A. 4th ventricle
   - B. Medulla
   - C. Cerebellum
   - **D. Pons**
4. Identify the structure
   - A. 4th ventricle
   - **B. Medulla**
   - C. Cerebellum
   - D. Pons

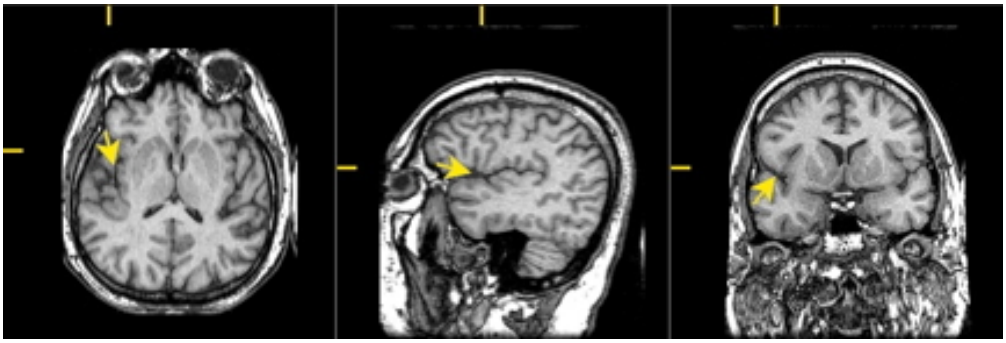


5. Identify the structure
    A. 4th ventricle
    B. Medulla
    C. Cerebellum
    D. Pons

6. Identify the structure
    A. Frontal lobe
    B. Parietal lobe
    C. Occipital lobe
    D. Temporal lobe

7. Identify the structure
    A. Frontal lobe
    B. Parietal lobe
    C. Occipital lobe
    D. Temporal lobe

8. These tissues provide external structural support and protection for the CNS.
    A. Astrocytes
    B. Meninges
    C. Cerebral ventricles
    D. Circle of Willis



9. What plane of section is represented in the left panel?
   A. Coronal
   B. Sagittal
   C. Axial/horizontal
   D. Dorsal

10. What plane of section is represented in the middle panel?
   A. Coronal
   B. Sagittal
   C. Axial/horizontal
   D. Dorsal

11. What plane of section is represented in the right panel?
   A. Coronal
   B. Sagittal
   C. Axial/horizontal
   D. Dorsal

12. What fissure or sulcus is represented in the figures?
   A. Superior temporal sulcus
   B. Central sulcus
   C. Longitudinal fissure
   D. Lateral fissure

13. Primary somatosensory cortex (SI) is found in the _____.
   A. Temporal lobe
   B. Frontal lobe
   C. Hypothalamus
   D. Basal ganglia
   E. Parietal lobe

14. Which of the following statements about neurons is *incorrect*?
    A. Neurons have very long lives.
    B. Neurons can extend over long distances.
    C. Neurons are the only cells that have negative resting potentials.
    D. Neurons use both electrical and chemical mechanisms to communicate.

15. Primary motor cortex is found in the _____.
    A. Temporal lobe
    B. Frontal lobe
    C. Hypothalamus
    D. Basal ganglia
    E. Parietal lobe

16. Your grandmother has a stroke. The neurologist chooses an X-ray-based structural brain imaging method that gives satisfactory, but not especially detailed spatial resolution. What method is that?
    A. Computed tomography (CT).
    B. functional MRI.
    C. Positron Emission Tomography (PET).
    D. Anterograde tract tracers.

17. Which of the following structures are *not* part of the basal ganglia?
    A. Caudate nucleus
    B. Globus pallidus
    C. Putamen
    D. Fornix

18. The _____plays a role in biologically crucial behaviors, including those associated with ingestion (eating and drinking) and reproduction.
    A. Temporal lobe
    B. Frontal lobe
    C. Hypothalamus
    D. Basal ganglia
    E. Parietal lobe

19. What maintains the intracellular (inside)/extracellular (outside) concentration differences of K^+ and Na^+ ions? _____.
    A. the myelin sheath.
    B. the force of diffusion.
    C. action of the Na^+/K^+ pump.
    D. ion flow through passive/leak channels.

20. The tough, canvas-like tissue that surrounds and protects the _____is called _____.
    A. white matter; cerebrospinal fluid (CSF)
    B. gray matter; myelin
    C. central nervous system (CNS); dura mater
    D. cerebral ventricles; endothelial cells

21. Scientists are exploring how chronic conditions like depression can change the size and shape of brain structures using high spatial resolution whole brain imaging techniques like _____.

    A. electroencephalography (EEG).

    B. hemodynamic response imaging.

    C. structural MRI.

    D. Computed Tomography (CT).

22. How many neurons are there in the human brain?

    A. About 86 billion.

    B. About 86 million.

    C. About the same number of seconds as in the average lifetime.

    D. It can't be estimated.

23. This type of glial cell provides neurons in the peripheral nervous system (PNS) with a myelin sheath.

    A. Schwann cells

    B. Oligodendrocytes

    C. Microglia

    D. Purkinje cells

24. The hippocampus plays a central role in _____.

    A. Sexual behavior

    B. Metabolic, physical support of neurons

    C. Sensory relay processing

    D. Memory storage and retrieval

    E. CNS protection

25. The sympathetic nervous system is crucial for

    A. Sexual behavior

    B. Metabolic, physical support of neurons

    C. Sensory relay

    D. Preparation for action

    E. Memory storage and retrieval

26. Sodium (Na+) is highly concentrated _____. This means that the force of diffusion acting alone will push Na+ _____.

    A. inside; inward

    B. outside; inward

    C. inside; outward

    D. outside; outward

27. You're having trouble sleeping, so your physician orders a sleep study using polysomnography. You spend a night in the hospital with electrodes on your scalp. This is an example use case of _____.

    A. electroencephalograpy (EEG).

    B. Multi-unit recording.

    C. transcranial magnetic stimulation.

    D. optical imaging.

28. _____, a type of glial cell, help regulate local blood oxygen levels in response to neuronal activity. These cells thus contribute to the signal measured by _____.

    A. oligodendrocytes; MEG

    B. Schwann cells; structural MRI

    C. astrocytes; functional MRI

    D. microglia; structural and functional MRI

29. Which ventral midbrain region is one of the main sites for neurons that relase neuromodulators (e.g., dopamine, norepinephrine, and serotonin)?

    A. Basal ganglia

    B. Lateral geniculate nucleus

    C. Tegmentum

    D. Tectum

30. The hypothalamus is NOT responsible for which of the following functions?

    A. Fleeing

    B. Feeding

    C. Fighting

    D. Falling

31. Which of the following marks the medial boundary of the frontal lobe?

    A. Lateral fissure

    B. Longitudinal fissure

    C. Central sulcus

    D. Inferior temporal gyrus

32. Nodes of Ranvier, or gaps in the myelination of an axon, serve which purpose?

    A. Increase the speed of propagation.

    B. Allow space in the axon for neurotransmitter release.

    C. Provide structural support to the neuron.

    D. Combine input from different dendrites.

33. Descartes thought that this midbrain structure was the place where the soul interacted with the body to create movement by inflating the muscles.

    A. Pons

    B. Cerebral aqueduct

    C. Pineal gland

    D. Superior colliclus

34. When a neuron' membrane potential is "at rest," which of the following ions are more heavily concentrated *inside* of the cell?

    A. Na+ and Cl-

    B. K+ and A-

    C. Na+ and K+

    D. Cl- and A-

35. When a neuron's membrane potential reaches the threshold for an action potential, _____.

    A. voltage-gated K+ channels close

    B. voltage-gated Na+ channels close and inactivate

    C. the Na/K pump works even harder to keep the concentration balance.

    D. voltage-gated Na+ channels open

36. This part of the cell functions as the neuron's "antennae" by serving as the primary place for receiving input.

    A. Axon

    B. Soma

    C. Dendrites

    D. Terminal Buttons

37. During the *falling* phase of the action potential, _____channels _____.

    A. Ligand-gated K+; close

    B. Voltage-gated Na+; close

    C. Voltage-gated Na+; open

    D. Voltage-gated K+; remain open

38. The speed of electrical signalling via action potentials is _____the speed of chemical signalling via diffusion.

    A. much faster than

    B. much slower than

    C. about the same speed as

    D. slightly slower than

39. During the *absolute* refractory period, a neuron will _____.

    A. fire again in response to an especially strong input.

    B. produce an action potential that is twice the normal size.

    C. open voltage-gated Ca++ channels.

    D. not fire no matter the strength of the input.

40. All of the following ions move across the neuronal membrane at different times *EXCEPT*

    A. Na+

    B. K+

    C. Cl-

    D. Organic anions (A-)

2 Bonus

41. During the *rising* phase of the action potential, _____ions _____.

    A. K+; flow out

    B. Na+; flow out

    C. K+; flow in

    D. Na+; flow in

42. The _____, a large axon fiber bundle that connects the two cerebral hemispheres, lies deep within the _____.

    A. anterior commissure; superior longitudinal fissure

    B. posterior commissure; post-central gyrus

    C. corticospinal tract; brainstem

    D. corpus callosum; superior longitudinal fissure

43. In a typical neuron near or slightly above its resting potential chloride (Cl-) ions would flow _____following the concentration gradient. This would move the neuron _____its firing threshold.

    A. Inward; farther from

    B. Inward; closer to

    C. Outward; farther from

    D. Outward; closer to

44. A toxin found in Japanese pufferfish blocks voltage-gated Na+ channels. Applying such a toxin to neurons would have what effect?

    A. Slower falling phase of the action potential.

    B. Increasing the concentration of Na+ inside the cell.

    C. K+ ions would accelerate their flow to compensate.

    D. Action potentials would be abolished.