Name _____KEY_____

Lab Section _____

Nsci 2100: Human Neuroanatomy
2018 Examination 1

On this page, write your name and lab section.

On your scantron answer sheet, enter your name (last name, space, first name), internet ID (X.500 name) and student number. Please do it now!!!

Lecture 2 overview

1. The medulla is …
   - A. rostral to the pons
   - → B. rostral to the spinal cord
   - C. rostral to the third ventricle

2. A tract is a …
   - → A. group of axons in the central nervous system (CNS).
   - B. group of axons in the peripheral nervous system (PNS).
   - C. group of neurons in the CNS.
   - D. group of neurons in the PNS.
   - E. structure in the brain that carrries cerebrospinal fluid (CSF).

3. Which of the following lobes of the cerebral cortex is NOT readily visible in a view of the lateral surface of the human brain?
   - A. frontal
   - B. parietal
   - C. temporal
   - D. occipital
   - → E. limbic

4. The medial longitudinal fissure (or interhemispheric fissure) is in which major plane of the brain?
   - A. coronal
   - → B. sagittal
   - C. horizontal
   - D. frontal

Lecture 3 development

5. From which primary germ layer does the nervous system develop?
   - A. mesoderm
   - B. neuroderm
   - → C. ectoderm
   - D. endoderm
   - E. epiderm

6. The cells at the lateral margin of the neural plate could develop into which of the following cell types?
   A. motor neurons
→ B. dorsal root ganglion neurons
   C. floor plate glia
   D. vertebrae (bone)

7. Cells in which of the primary brain vesicles will develop into the superior colliculus?
   A. forebrain
→ B. midbrain
   C. optic vesicle
   D. hindbrain
   E. spinal cord

8. Motor neurons will develop from cells in what region of the neural tube?
   A. alar plate
→ B. basal plate
   C. floor plate
   D. roof plate
   E. dinner plate

Lecture 4 ventricles, CSF & meninges

9. The cerebral aqueduct connects …
   A. the right lateral ventricle to the left lateral ventricle.
   B. the second ventricle to the third ventricle.
→ C. the third ventricle to the fourth ventricle
   D. the fourth ventricle to the fifth ventricle
   E. a ventricle to a space in the meninges.

10. Ependymal cells line the ventricles. True or false?
→ A. true
   B. false

11. The choroid plexus …
   A. collects the venous blood from the brain.
   B. is a circle of arteries on the base of the brain.
   C. is where the blood picks up oxygen.
→ D. makes cerebrospinal fluid (CSF).

12. In a healthy normal person, there is a fluid-filled space between …
   A. the skull and the arachnoid.
   B. the skull and the dura.
   C. the dura and the arachnoid.
→ D. the arachnoid and the pia.

13. The falx cerebri …
   A. is part of the arterial blood system of the brain.
→ B. is between the right and left cerebral hemispheres.
   C. is between the cerebral hemispheres and the cerebellum.
   D. is between the cerebellum and the spinal cord.
   E. is between the ventricles in the heart.

Lecture 5 blood supply

14. The main function of red blood cells is to carry …
→ A. oxygen (O_2).
B. carbon dioxide (CO_2).
C. glucose ($C_6H_{12}O_6$).
D. oxygen (O_2) and carbon dioxide (CO_2).
E. oxygen (O_2), carbon dioxide (CO_2) and glucose ($C_6H_{12}O_6$).

15. In a normal healthy person, approximately what percentage of the blood flow is to the brain?
A. 5%
B. 10%
→ C. 20%
D. 30%
E. 40%

16. Blood returning to the heart from the body that has a low level of oxygen (O_2) and a high level of carbon dioxide (CO_2) first enters what chamber of the heart?
→ A. right atrium
B. left atrium
C. right ventricle
D. left ventricle
E. central ventricle

17. What are the two pairs of vessels by which blood enters the cranium to supply the brain?
A. basilar arteries and internal jugular arteries
B. internal jugular arteries and internal carotid arteries
→ C. internal carotid arteries and vertebral arteries
D. vertebral arteries and dural sinus arteries
E. dural sinus arteries and basilar arteries

18. Which of the following statements regarding dural venous sinuses is NOT true?
A. Dural venous sinuses drain into the internal jugular veins.
→ B. Dural venous sinuses distribute blood coming from the heart to most of the brain.
C. Dural venous sinuses are between the two layers of the dura.
D. Cerebrospinal fluid (CSF) ultimately drains into the dural venous sinuses.

Lecture 6 cells

19. Which of the following cell organelles links amino acids during the synthesis of proteins?
A. golgi apparatus
→ B. ribosome
C. lysosome
D. mitochondria
E. nucleolus

20. The cell membrane or plasma membrane continuously surrounds the entire outside surface of a neuron except the …
A. dendrites.
B. soma.
C. axon.
D. synapses.
→ E. None of the above are correct as the cell membrane surrounds the entire neuron.

21. Which of the following statements is NOT true regarding the phospholipid bilayer of the cell membrane?
    A. The phospholipid bilayer is a barrier to the movement of water between the inside and outside of the neuron.
    B. The phospholipid bilayer is a barrier to the movement of proteins between the inside and outside of the neuron.
→ C. The phospholipid bilayer allows the free movement of most ions between the inside and outside of the neuron.
    D. Some proteins form pores embedded in the phospholipid bilayer.
    E. All of the above answers are true.

22. Which of the following is true regarding Schwann cells?
    A. They are the most abundant cell type in the brain and spinal cord.
    B. They line the ventricles.
    C. They are described as housekeeping cells that clean up cellular debris after injury or disease.
    D. They myelinate axons in the spinal cord.
→ E. They myelinate axons in peripheral nerves.

Lecture 7 electrical properties

23. What is a key characteristic of an ion dissolved in water that we say has a positive charge?
    A. The atom gives off electrons freely so is responsible for a flow of electricity.
→ B. The atom has fewer electrons than protons.
    C. The atom stays tightly bound to an atom with a negative charge.
    D. The atom is radioactive.
    E. The atom borrowed a proton from another atom.

24. A particularly strong excitatory input to a neuron is likely to result in …
    A. an action potential with a higher voltage (i.e. an action potential with greater depolarization).
    B. a longer action potential (i.e. an action potential that is slower to decay).
→ C. more action potentials (i.e. more frequent action potentials).
    D. an action potential with little or no refractory period.

25. Which of the following is TRUE regarding the resting membrane potential?
→ A. The sodium-potassium pump pumps sodium (Na^+) out of the cell and potassium (K^+) into the cell when a neuron is at rest.
    B. No energy is required to maintain the resting membrane potential.
    C. The concentration of chloride ion is higher inside of the cell than outside when the neuron is at rest, which is why the cell is said to have a negative charge.
    D. All ion channels are closed when the neuron is at rest.

26. An action potential is generated when …
    A. the initial segment of the axon becomes sufficiently hyperpolarized.
→ B. the initial segment of the axon becomes sufficiently depolarized.
    C. the voltage-gated sodium (Na^+) channels in the initial segment of the axon close.
    D. the membrane potential for most neurons reaches approximately -65mV.
    E. More than one of the above is true.

Lecture 8 synaptic communication

27. The disease tetanus is due to …
    A. the loss of myelin on the axons of motor neurons.
    B. a blockage that prevents cerebrospinal fluid (CSF) from getting out of the brain.
→ C. the inability of certain inhibitory interneurons to release their neurotransmitter.
    D. the death of certain neurons as the result of a virus.

28. G-proteins are …
    A. needed for fusion of synaptic vesicles in the cell membrane.
    B. needed in the initial segment of axons for generation of action potentials.
→ C. needed to mediate the action of certain neurotransmitter receptors.
    D. a component of serum.

29. Which of the following statements regarding communication at a traditional synapse is NOT true?
    A. An action potential causes an influx of calcium ions (Ca^{++}) ions into the presynaptic terminal.
    B. Neurotransmitter molecules diffuse across the synaptic cleft to the postsynaptic cell.
→ C. Synaptic vesicles are released into the synaptic cleft by the presynaptic terminal and are taken up by the postsynaptic terminal.
    D. Neurotransmitter initiates depolarization or hyperpolarization of the postsynaptic cell.
    E. All of the above are correct.

30. Which of the following can be recycled by being broken down into glutamine in glial cells?
    A. acetylcholine
    B. dopamine
→ C. GABA
    D. norepinephrine
    E. serotonin

Lecture 9 spinal cord

31. Which of the following is a characteristic of lumbar vertebrae?
    A. Each has ribs attached to it.
    B. They are in the neck.
→ C. They are in the lower back.
    D. All five are fused into a single bone.
    E. They are part of the pelvis.

32. Axons carrying sensory information typically enter the spinal cord via a …
    A. spinal nerve.
    B. ventral root.
→ C. dorsal root.
    D. lateral root.
    E. medial root.

33. Where do most axons in the spinothalamic tract synapse?
    A. dorsal horn of the spinal cord
    B. ventral horn of the spinal cord
→ C. thalamus
    D. cerebellum
    E. muscles

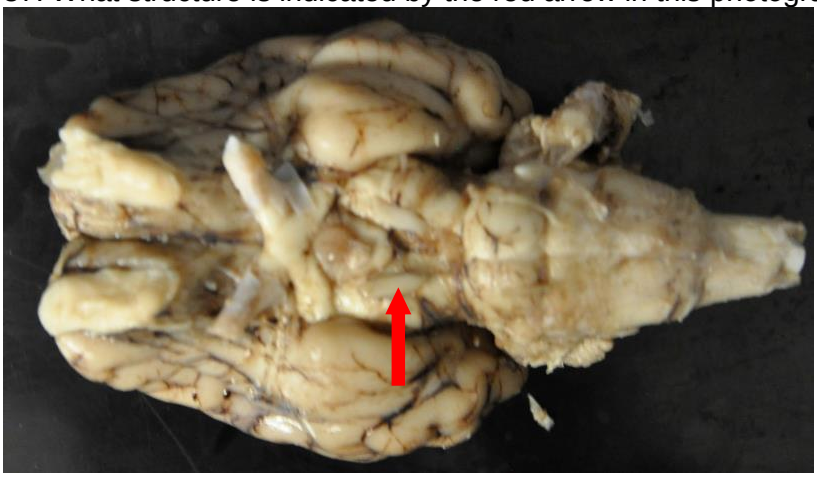
34. The spinocerebellar tract runs in what region of the spinal cord?
    A. ventral funiculus
→ B. lateral funiculus
    C. dorsal funiculus
    D. central gray
    E. ventral horn

35. In what level of the spinal cord is the most white matter present?
    A. sacral
→ B. cervical
    C. lumbar
    D. thoracic

Laboratory 1 & 2

36. Which of the following lobes of the cerebral cortex are separated by the central sulcus?
→ A. Frontal lobe and parietal lobe
    B. Frontal lobe and occipital lobe
    C. Parietal lobe and occipital lobe
    D. Parietal lobe and temporal lobe
    E. Temporal lobe and occipital lobe

37. What structure is indicated by the red arrow in this photograph of a sheep's brain?



    A. Optic nerve
    B. Optic tract
→ C. Oculomotor nerve
    D. Trigeminal nerve
    E. Abducens nerve

38. The hypothalamus is derived from which of the following subdivisions of the developing brain?
    A. Telencephalon
→ B. Diencephalon
    C. Mesencephalon
    D. Metencephalon
    E. Myelencephalon

39. What structure is indicated by the red arrow in this cast of the ventricular system of the human brain?

A. Central canal
B. Fourth ventricle
C. Cerebral aqueduct
D. Third ventricle
→ E. Lateral ventricle

40. What artery supplies much of the lateral surface of the cerebral cortex?
A. anterior cerebral artery
→ B. middle cerebral artery
C. lateral cerebral artery
D. medial cerebral artery
E. posterior cerebral artery

The End!

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Double check that your name is on both.