

Name _____ KEY _____

Lab Section _____

**Nsci 2100: Human Neuroanatomy
2018 Examination 3**

On this page, please write your name and lab section.

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

Lecture 23 motor system

1. Where are the cell bodies for neurons that synapse with and initiate contraction of the quadriceps muscle in the leg?
 - A. ganglia in the leg
 - B. ganglia near the spinal cord
 - C. brainstem
 - D. spinal cord ventral horn
 - E. More than one of the above are correct.

2. Which of the following statements regarding type I and type II myofibers is correct?
 - A. Type I fibers use only myosin for contraction and type II fibers use mainly actin.
 - B. Long periods of exercise at low to moderate exertion will increase the proportion of type I fibers.
 - C. Most type II fibers receive synapses from several motor neurons, which is why they are so fast.
 - D. Type II fibers have a higher density of mitochondria than type I fibers.

3. What symptom is likely following a stroke in the precentral gyrus near the lateral sulcus?
 - A. paralysis of the leg and/or foot
 - B. paralysis of the face
 - C. loss of the sense of touch on the leg and/or foot
 - D. loss of the sense of touch on the face
 - E. an inability to use vision to locate objects in space

4. To what does α -bungarotoxin bind?
 - A. myosin
 - B. acetylcholine
 - C. acetylcholine receptor
 - D. serotonin
 - E. motor neuron synaptic vesicles

Lecture 24 basal ganglia

5. The caudate nucleus is in what part of the brain?
 - A. diencephalon
 - B. midbrain
 - C. telencephalon
 - D. pons
 - E. medulla

6. Which of the following statements regarding the basal ganglia is NOT true?
- A. A main output of the basal ganglia is from the globus pallidus internus.
 - B. The main output of the basal ganglia is to thalamus.
 - C. The main output of the basal ganglia uses glutamate as the neurotransmitter and is excitatory.
 - D. The main input to the basal ganglia is from neocortex.
 - E. The subthalamic nucleus is part of the basal ganglia circuitry.
7. Which of the following is NOT a typical symptom of Parkinson's disease?
- A. rigidity
 - B. resting tremor
 - C. hyperkinesia
 - D. akinesia
8. Some neurons with their cell bodies in the striatum use dopamine as their neurotransmitter. Death of these neurons results in Parkinson's disease. True or false?
- A. True
 - B. False

Lecture 25 cerebellum

9. Where do the axons of purkinje cells in the vermis (midline) region of the cerebellum synapse?
- A. interposed (deep cerebellar) nucleus
 - B. inferior olivary nucleus in the medulla
 - C. vestibular nuclei in the medulla
 - D. red nucleus in the midbrain
 - E. ventrolateral nucleus in the thalamus
10. A major input to the vermis of the cerebellar cortex is from the ...
- A. cerebral cortex.
 - B. spinal cord.
 - C. vestibular nerve and vestibular nuclei.
 - D. pontine nuclei.
 - E. dentate nucleus.
11. What part of the cerebellum is particularly important for maintaining balance?
- A. vermis
 - B. cerebellar hemispheres
 - C. anterior lobe
 - D. posterior lobe
 - E. flocculonodular lobe
12. Which of the following receives a major input from the cerebellum and sends axons that synapse with lower motor neurons?
- A. red nucleus
 - B. inferior olivary nucleus
 - C. ventrolateral nucleus in the thalamus
 - D. pontine nucleus
 - E. caudate nucleus

13. Which of the following is NOT a common symptom of cerebellar pathology?

- A. ataxia
- B. nystagmus
- C. involuntary flailing of the trunk and limbs
- D. tremor particularly when performing a precise movement

Lecture 26 eye movements (from Dr. L. McLoon)

14. What nerve innervates four of the six extraocular muscles?

- A. oculomotor (CN III)
- B. trochlear (CN IV)
- C. trigeminal (CN V)
- D. abducens (CN VI)
- E. facial (CN VII)

15. Optokinetic nystagmus allows you to

- A. fixate on stationary objects when you are rotating.
- B. fixate on slowly moving objects when the head is held still.
- C. maintain your focus on a single spot in the visual world.
- D. view close objects.
- E. see during brief head movements.

16. Which of the following is illustrated in the photo of the eyes shown below?

- A. This child has nystagmus.
- B. This child has strabismus.
- C. This child is looking to the left.
- D. This child has reduced vision in both eyes.
- E. None of the above is true.



17. Which muscles contract if you look directly to the left in the horizontal plane?

- A. right lateral rectus and right medial rectus
- B. left lateral rectus and left medial rectus
- C. left lateral rectus and right medial rectus
- D. right lateral rectus and left medial rectus
- E. left lateral rectus and right lateral rectus

Lecture 27 autonomics

18. Preganglionic parasympathetic axons for control of the heart, lungs and a portion of the gut run in the ...

- A. facial nerve (CN VII).
- B. glossopharyngeal nerve (CN IX).
- C. vagus nerve (CN X).
- D. spinal nerves from cervical spinal cord.
- E. spinal nerves from thoracic spinal cord.

19. Which of the following is NOT a characteristic of the parasympathetic nervous system?
- A. Ganglia are near their target tissues.
 - B. Preganglionic neurons are in the thoracic spinal cord.
 - C. It is described as the rest-and-digest system.
 - D. Most preganglionic axons are long compared to the post-ganglionic axons.
20. The conscious perception of bloatedness or gas in the colon involves sensory information relayed from the thalamus to what area of cortex?
- A. prefrontal cortex
 - B. precentral gyrus
 - C. postcentral gyrus
 - D. posterior parietal lobe
 - E. insular cortex
21. What neurotransmitter when released in the venous sinusoids of the penis causes an erection?
- A. noradrenalin (norepinephrine)
 - B. adrenalin (epinephrine)
 - C. acetylcholine
 - D. nitric oxide
 - E. phenylephrine
22. Stress induced by a neuroanatomy exam is likely to have what effect?
- A. increased activation of the parasympathetic nervous system throughout the body
 - B. increased release of epinephrine and norepinephrine from the adrenal (suprarenal) gland into the blood
 - C. increased release of epinephrine and norepinephrine from the pineal gland into the blood
 - D. increased release of epinephrine and norepinephrine from the pineal gland into the hypothalamus
 - E. increased activity in the flocculonodular lobe

Lecture 28 reticular formation & sleep (from Dr. Riedl)

23. Which of the following brain structures sends an output to the brainstem reticular formation?
- A. cerebral cortex
 - B. cerebellum
 - C. spinal cord
 - D. thalamus
 - all E. More than one of the above correct.
24. Which of the following functions is NOT influenced by the reticular formation?
- A. eye movements
 - B. heart rate
 - C. blood pressure
 - D. pain perception
 - E. None are correct, as all of these functions are modulated by the reticular formation.

25. What nucleus is primarily responsible for synchronizing circadian rhythms to the light/dark cycle?
- A. Paraventricular nucleus
 - B. Oculomotor nucleus
 - C. Preoptic nucleus
 - D. Suprachiasmatic nucleus
 - E. Supraoptic nucleus
26. Which of the following disorders is characterized by interruptions in REM sleep?
- A. Night terrors
 - B. Sleep walking
 - C. Restless leg syndrome
 - D. Parkinson's disease
27. When are melatonin levels the highest?
- A. During light periods
 - B. During dark periods
 - C. Following exercise
 - D. Immediately upon waking
 - E. Immediately after ingesting a cup of coffee

Lecture 29 hypothalamus (from Dr. Wessendorf)

28. The medial hypothalamus is separated from the lateral hypothalamus by what structure?
- A. Fornix
 - B. Lamina terminalis
 - C. Hypothalamic sulcus
 - D. Mammillary bodies
 - E. Mammillothalamic tract
29. The hypothalamus is separated from the thalamus by what structure?
- A. Fornix
 - B. Lamina terminalis
 - C. Hypothalamic sulcus
 - D. Mammillary bodies
 - E. Mammillothalamic tract
30. What hormone promotes milk ejection in females, as well as promoting social bonding within one's own group?
- A. Thyrotropin-releasing hormone (TRH)
 - B. Somatostatin
 - C. Antidiuretic hormone (ADH)
 - D. Adrenal corticotropic hormone (ACTH)
 - E. Oxytocin
31. What part of the hypothalamus contains neurons that are directly activated by INCREASED body temperature?
- A. Suprachiasmatic nucleus
 - B. Arcuate nucleus
 - C. Dorsomedial nucleus
 - D. Preoptic nucleus
 - E. Supraoptic nucleus

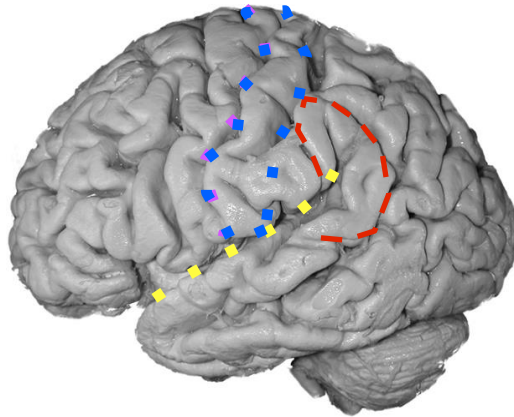
Lecture 30 limbic system (from Dr. Wessendorf)

32. Which of the following nuclei or tracts is part of the limbic system?
- A. Anterior nucleus of the thalamus
 - B. Hippocampus
 - C. Mammillary bodies
 - D. Fornix
 - E. More than one of the above are correct.
33. Patient HM received surgery for epilepsy that destroyed a part of his brain on both sides. This surgery left him unable to acquire new long-term declarative memory. What part of his brain was destroyed?
- A. Prefrontal cortex
 - B. Temporal lobe
 - C. Cingulate gyrus
 - D. Occipital lobes
 - E. Fornix
34. Bilaterally destroying which of the following brain regions would be expected to reduce or eliminate fear of a predatory animal (although not the panic experienced in response to inhaling 35% CO₂)?
- A. Insular cortex
 - B. Amygdala
 - C. Hippocampus
 - D. Anterior occipital cortex
 - E. Prefrontal cortex
35. In 1846, Phineas Gage received an injury that dramatically reduced his ability for self-control (at least initially). Which of the following regions was directly injured?
- A. Insular cortex
 - B. Amygdala
 - C. Hippocampus
 - D. Anterior occipital cortex
 - E. Prefrontal cortex

Laboratory #6-8 (from Dr. Riedl)

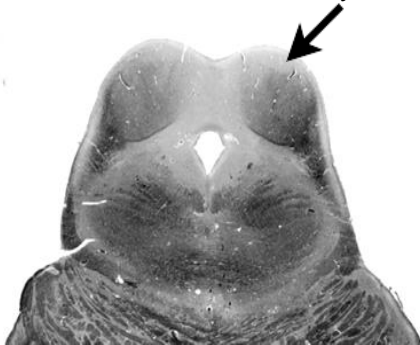
36. Which extracellular ion has the greatest effect on the resting membrane potential of a neuron?
- A. Sodium
 - B. Potassium
 - C. Calcium
 - D. Chloride
 - E. Iron
37. Where is the first synapse for touch and proprioceptive information from the leg?
- A. Spinal cord interneuron
 - B. Nucleus cuneatus
 - C. Ventral posterior medial (VPM) nucleus of the thalamus
 - D. Nucleus gracilis
 - E. Ventral posterior lateral (VPL) nucleus of the thalamus

38. What function is associated with the area of the cortex outlined by the dotted blue line?



- A. Speech
- B. Vision
- C. Hearing
- D. Motor control
- E. Somatosensation

39. What structure is indicated by the arrow?



- A. Lateral geniculate
- B. Superior colliculus
- C. Medial geniculate
- D. Inferior colliculus
- E. Dorsal cochlear nucleus

40. What structure is responsible for the blind spot?

- A. Fovea
- B. Optic disk
- C. Iris
- D. Pupil
- E. Optic chiasm

The End!

**Please turn in this exam and your scantron in the box at the back of the room.
Double check that your name is on both.**