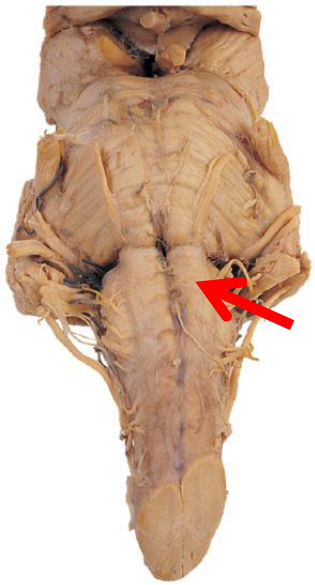
Name _____KEY_____

Nsci 2001: Human Neuroanatomy
2019 Examination 2

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 12 brainstem

1. To what does the red arrow point in the photograph of the human brainstem to the right?
   - A. dorsal columns
   - B. cerebellar peduncle
   - C. olive
   - D. basal pons
   - → E. pyramids



2. Most axons that run in the pyramids cross the midline of the brain at the level of the …
   - A. thalamus.
   - B. pons.
   - → C. medulla.
   - D. cerebral cortex.
   - E. midbrain.

3. Which of the following is NOT visible on the ventral surface of the intact adult human brain?
   - A. hypothalamus
   - B. pons
   - C. optic chiasm
   - → D. basal ganglia
   - E. None of the above are correct as none are visible on the ventral brain surface.

4. How many pairs of cerebellar peduncles are there in the human brain?
   - A. 1
   - B. 2
   - → C. 3
   - D. 4
   - E. 5

Lecture 13 forebrain

5. What is one way in which the thalamus is important for learning neuroanatomy?
   A. It stores short-term memories.
   B. It stores long-term memories.
→ C. It gates the flow of sensory information to the cortex, which allows you to focus on your studies.
   D. It gates the flow of motor output from the cortex, which allows you to sit still while you are studying.
   E. It releases hormones into the blood that help you stay awake while you are studying.

6. Axons from neurons in the thalamus synapse mainly on neurons in what layer of the cerebral cortex?
   A. layer II/III
→ B. layer IV
   C. layer V
   D. layer VI
   E. layer VII

7. One of the functions of the hypothalamus is to regulate circadian rhythms. True or false?
→ A. true
   B. false

8. The medial geniculate nucleus is a relay nucleus passing information from the _____ to the _____ . (fill in the blanks)
→ A. inferior colliculus, auditory cortex
   B. hypothalamus, cingulate cortex
   C. retina, visual cortex
   D. basal ganglia, motor cortex
   E. hippocampus, cingulate cortex

9. The corpus callosum is a …
   A. nucleus of the thalamus.
   B. nucleus of the brainstem.
   C. bundle of axons descending from cortex to lower brain regions.
→ D. bundle of axons connecting the two cerebral hemispheres.
   E. bundle of axons carrying somatosensory information from the brainstem to the thalamus.

Lecture 14 cranial nerves

10. Which cranial nerve does not contain Schwann cells?
→ A. optic nerve (CN II)
   B. oculomotor nerve (CN III)
   C. glossopharyngeal nerve (CN IX)
   D. vagus nerve (CN X)
   E. accessory nerve (CN XI)

11. Cranial nerves can have one or more major functions. Which of the following is NOT a function of any cranial nerve?
    A. general motor
    B. general sensory
    C. special sensory
→ D. sympathetic motor
    E. parasympathetic motor

12. Bell's Palsy is usually due to a loss of function of which cranial nerve?
    A. trigeminal nerve (CN V)
    B. abducens nerve (CN VI)
→ C. facial nerve (CN VII)
    D. glossopharyngeal nerve (CN IX)
    E. hypoglossal nerve (CN XII)

13. Which of the following cranial nerves carries axons that arise from spinal cord neurons?
    A. glossopharyngeal nerve (CN IX)
    B. vagus nerve (CN X)
→ C. accessory nerve (CN XI)
    D. hypoglossal nerve (CN XII)
    E. None of the above is correct as none have a spinal contribution.

Lecture 15 & 16 somatosensory

14. A stroke in the right ventral posterior nucleus of the thalamus is likely to result in an inability to detect what sensory modalities and where?
    A. pain on the left side of the body and proprioception on the right side of the body
    B. pain on the right side of the body and proprioception on the left side of the body
    C. pain on the right side of the body and proprioception on the right side of the body
→ D. pain on the left side of the body and proprioception on the left side of the body

15. Which of the following statements regarding the dorsal column pathway and spinothalamic pathway is TRUE?
    A. These two pathways use different thalamic nuclei.
    B. Axons in these two pathways travel together in the spinal cord.
→ C. The information carried by these two pathways goes to the same cortical region.
    D. Axons in these two pathways cross the midline of the nervous system at the same place.
    E. More than one of the above are true.

16. An area of the body in which axons in a single spinal nerve are activated by a somatosensory stimulus is called a . . .
    A. somatosensory patch.
    B. spinal patch
    C. dermapatch.
→ D. dermatome.
    E. spinaltome.

17. Hyperalgesia is…
    A. a tingling sensation.
    B. a lack of temperature sensation.
→ C. increased pain sensitivity.
    D. an allergic reaction in the skin.
    E. a technical word for 'itch'.

18. The frequency of action potentials in primary somatosensory neurons encodes what property of the stimulus?
    A. type of stimulus
    B. location of the stimulus
→ C. strength of the stimulus
    D. duration of the stimulus

19. Nociceptors are sensitive to what type of stimulus?
    A. touch
    B. vibration
→ C. pain
    D. temperature change
    E. tendon stretch

20. Which of the following is NOT one of the ascending (sensory) tracts in the spinal cord?
    A. dorsal columns
    B. spinocerebellar tract
    C. spinothalamic tract
→ D. ventral corticospinal tract
    E. None of the above are correct as all are ascending sensory spinal tracts.

21. Which of the following is primarily responsible for mediating the placebo effect?
    A. trigeminal ganglia
    B. dorsal root ganglia
→ C. periaqueductal gray (PAG) neurons
    D. medial lemniscus
    E. nociceptors

Lecture 17 & 18 vision

Everyone received credit for # 22 since there are two possible answers.

22. Which part of the eye is responsible for FINE focus of images on the retina?
    A. pupil
→ B. lens
→ C. ciliary body
    D. iris

23. Which of the following statements regarding cone cells is NOT true?
→ A. The light sensitive protein used by cone cells is rhodopsin.
    B. Cone cells are most sensitive to one of three wavelengths of light (i.e. colors).
    C. Cone cells function poorly in low illumination (i.e. low light).
    D. Cone cells are in the photoreceptor cell layer of the retina.
    E. Cone cells have synapses with horizontal cells and bipolar cells.

24. In dark conditions, photoreceptors …
→ A. depolarize and release glutamate.
B. hyperpolarize and release GABA.
C. hyperpolarize and release glutamate.
D. depolarize and release GABA.
E. None of the above are correct.

25. Which of the following cell types typically fire action potentials?
A. photoreceptors
B. bipolar cells
C. amacrine cells
→ D. ganglion cells
E. None of the above are correct.

26. Which of the following statements regarding the fovea is NOT true?
A. The fovea has only cone photoreceptors and no rods.
→ B. The fovea has only rod photoreceptors and no cones.
C. The fovea has no blood vessels.
D. The fovea has only photoreceptor cells; the other cell types are pushed to the side.

27. Axons from neurons on which side of the retina will decussate (i.e. cross the midline of the brain) in the optic chiasm?
A. temporal side
→ B. nasal side

28. Orientation columns in primary visual cortex …
A. span multiple layers of V1 cortex.
B. are activated strongly by a bar of light in a specific orientation.
C. are weakly or not at all activated by most orientations of light.
D. are part of V1 hypercolumns.
→all E. More than one of the above are correct.

29. Neurons in which parts of the brain are described as monocular?
A. lateral geniculate nucleus
B. layer III of primary visual cortex (V1 or area 17)
C. layer IV of primary visual cortex (V1 or area 17)
D. layer III of secondary visual cortex (V2 or area 18)
→AC E. More than one of the above are correct.

30. A period during development in which the axonal wiring is plastic (i.e. can be changed) is called the ...
A. developmental period.
B. plastic period.
→ C. critical period.
D. early period.

Lecture 19 hearing & balance

31. What is the eustachian tube?
    A. It collects sound and guides it to tympanic membrane.
    B. It vibrates in response to sound.
    C. It is a snail-shaped chamber encased in bone.
→ D. It connects the middle ear chamber to the pharynx.

32. Normal hearing requires three small bones that are in the …
    A. external auditory meatus (ear canal)
→ B. middle ear.
    C. lateral ear.
    D. inner ear.
    E. eustachian tube.

33. The tympanic membrane is positioned between the …
→ A. external ear and middle ear.
    B. middle ear and inner ear.
    C. middle ear and pharynx.
    D. inner ear and pharynx.
    E. inner ear and brain.

34. In both the vestibular and auditory system, the receptor cells are called …
    A. mechano cells.
    B. vibrissae.
→ C. hair cells.
    D. tuning cells.
    E. ciliary cells.

35. Which of the following is NOT a part of the vestibular sensory apparatus?
→ A. basilar membrane
    B. utricle
    C. saccule
    D. semicircular canal
    E. stereocilia

Lecture 20 olfaction and taste

36. Anosmia refers to a disorder characterized by a reduction of which sense?
    A. taste
    B. touch
→ C. smell
    D. vision
    E. hearing

37. Which is NOT one of the five main tastes detected by taste receptor cells?
→ A. spicy
    B. umami
    C. sour
    D. bitter
    E. salty

38. Which of the following is the first cortical area to process taste sensory information?
    A. parietal cortex
→ B. insular cortex
    C. orbitofrontal cortex
    D. piriform cortex
    E. cingulate gyrus

39. Which of the following statements regarding monosodium glutamate (MSG) probably is NOT true?
    A. MSG enhances the flavor of savory food.
→ B. MSG causes numbing of the neck and headaches.
    C. MSG stimulates the umami taste receptors.
    D. MSG is a common food additive, particularly in certain Asian countries.
    E. All of the above statements are true, and none are false.

40. Axons in most sensory systems are relayed from station to station in the brain organized in a pattern that matches the physical map of their initial receptors. We call this a topographic pattern of connections. Which sensory system is an exception to this generalization?
    A. auditory
→ B. olfactory
    C. somatosensory
    D. vision

Have a safe and relaxing spring break!

Please <u>turn in this exam and your scantron</u> at the front of the room.

Double check that your name is on both.