

### Sample Questions for the Midterm Exam

The format of the exams for this course is “short answer”. That is, each of these questions can be answered with a paragraph or two (at most) of concise English. Where indicated you may also answer by ‘filling-in-the-blanks’ or by making a list in point form.

1. **(Point form OK)** Not all cortical areas are associated with experience (i.e., consciousness). List 5 such areas and describe the functions associated with each. (2 points per area).
2. **(Point form OK)** The human brain has 12 pairs of ‘cranial’ nerves (i.e., peripheral nerves that project to or from the brain inside the skull). They are often numbered from 1 (olfactory nerve) through 12 (Hypoglossal). Name the remaining 10 in order from anterior to posterior. (1 point each).
3. **(Point form OK)** The cranial nerves carry information to and from the brain. For example, the Olfactory nerve (cranial nerve 1) is solely a sensory nerve with no motor component, while the Hypoglossal nerve (cranial nerve 12) is solely a motor nerve (innervating the muscles of the tongue). However, some cranial nerves are both sensory and motor. State whether each of the additional 10 pairs of cranial nerves have only sensory (S), only motor (M) or both sensory and motor (B) components.
4. **(Point form OK)** Describe 5 neurotransmitters that are associated with ‘systems’ within the brain (e.g., the nigrostriatal system)
5. Briefly define the following terms and prefixes by writing each in your answer booklet with its definition to the right (1 point for each definition):
  - dys-
  - a-
  - ipsi-
  - contra-
  - caudal
  - coronal,
  - saggital
  - transverse
  - distal
  - medial
6. Discuss the advantages and disadvantages of single case studies in neuropsychology.
7. Briefly describe the contribution to neuropsychology of **any one** of the following: Penfield, Broca, Wernicke, Flourens, Geschwind, Sperry, Gall, Mountcastle, Brodmann, von Economo, Ramon y Cajal, Golgi, Luria, Hounsfield, Hodgkin and Huxley.

8. Describe the structure and function of the ventricular system of the brain and spinal cord.
9. Describe, with an example, of how studying the effects of brain damage can help neuropsychologists understand normal brain function.
10. Discuss the difference between sensation and perception and provide an example that highlights this distinction.
11. One of the key features of both the visual and auditory systems is that they are organized hierarchically at the neural level. Expand on this statement.
12. In a sentence or two describe each of the following (2 points each up to 10 points):
  - Closed head injury
  - Cerebral edema
  - Cerebral Infarct
  - Ischemia
  - Thrombosis
  - Stroke
  - Hydrocephalus
  - Encephalitis
  - Anoxia
13. Many of the abnormal phenomena seen by neuropsychologists are observed following damage to the sensory, perceptual or motor systems. Explain why this is so.
14. Using standard neuroanatomic terms discussed in class for describing the relative positions of brain parts describe where each of the following is located (2 points for each correct description up to 10 points).
  - Frontal Lobe
  - Occipital Lobe
  - Parietal Lobe
  - Temporal Lobe
  - Hippocampus
  - Brainstem
  - Medulla
  - Tegmentum
  - Cerebellum
15. Describe the location and apparent functions of the reticular formation.
16. Explain the relationship between EPSPs, IPSPs and action potentials.
17. **(Point form OK)** Compare and contrast the 3 main types of glial cells.(3 points each; 10 points for all three)
18. **(Point form OK)** Compare and contrast the anatomical characteristics of a Purkinje Cell from the human cerebellum with those of a bipolar cell from the retina.

- 19. (Point form OK)** Compare and contrast relay neurons, association neurons, connector neurons and local circuit neurons (2 points each; 10 points for all four).
- 20.** Fill in the blanks and write out the complete sentence in your answer booklet (2 points each; 10 points for all four): The cranial nerves are considered a part of the peripheral nervous system, with the exception of cranial nerve number \_\_\_\_\_ which is considered to be a tract of the \_\_\_\_\_, connecting the \_\_\_\_\_ with the \_\_\_\_\_.
- 21.** Describe which cortical mapping scheme is used in present-day stereotaxic brain surgery and explain one of its major limitations.
- 22.** In a brief paragraph define the neurologic term “reflex” (not the optical term ‘reflex’).
- 23.** Briefly describe the following terms: cortico-cortical; thalamo-cortical; association;; fasciculus; tract; nucleus; ganglion; pyramids ; laminae. (1 point each).
- 24.** Vernon Mountcastle was the first to discover the columnar organization of cerebral cortex. In a paragraph or two describe the experimental procedure that led to this discovery.
- 25.** Fill in the blanks and write the complete paragraph in your answer booklet. (3 points each; 10 points for all three) Thirty-one pairs of spinal nerves make up part of the peripheral nervous system entering and exiting the spinal cord as ‘roots’. Spinal nerves carrying action potentials from the body to the CNS are called \_\_\_\_\_ nerves. These enter their respective segment of the spinal cord via the segment’s \_\_\_\_\_ roots. Spinal nerves carrying action potentials to muscles and glands exit their respective segment of the spinal cord via the \_\_\_\_\_ roots. This anatomical arrangement is referred to as the “Bell-Magendie Law”.
- 26.** Select the best answer from each choice and write the completed paragraph in your answer booklet: The sodium and potassium concentration of Cerebrospinal fluid (CSF) is (>, <, =) that of arterial blood. Its glucose concentration is (>,<,) that of arterial blood.
- 27.** In a brief paragraph describe the anatomic course of visual information starting at its general location in the visual field and ending at its neural representation in the primary visual cortex of the left hemisphere.
- 28.** What are the most prevalent excitatory and inhibitory neurotransmitters in the nervous system?

End of questions.