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# **Chapter 1: A Brief History of Cognitive Neuroscience**

#### LEARNING OBJECTIVES

- 1.1 Explain the origins of the field of cognitive neuroscience.
- 1.2 Describe the roots of the debate over localization of function.
- 1.3 Explain the ways in which brain structure was studied.
- 1.4 Understand the philosophical origins of cognitive psychology.
- 1.5 Discuss behaviorism and its principal tenets.
- 1.6 Explain how and why cognitive psychology came to the forefront of the psychological fields.
- 1.7 Identify the different methods that are used to measure brain function and structure.

### MULTIPLE CHOICE

- 1. What term was coined by Thomas Willis as a consequence of the case of Anne Green?
  - a. psychopathology
  - b. cognition
  - c. neurology
  - d. psychosis

ANS: C	DIF:	Easy	REF:	1.1 A Historical Perspective
OBJ: 1.1	MSC:	Remembering		

- 2. Aside from saving Anne Green's life, Thomas Willis and Christopher Wren also
  - a. created very accurate drawings of the brain.
  - b. came up with the names of a number of brain structures.
  - c. took the first steps that led to cognitive neuroscience.
  - d. All of the answer options are correct.

ANS:	D	DIF:	Medium	REF:	1.1 A Historical Perspective
OBJ:	1.1	MSC:	Understanding	5	

- 3. Each of the following are reasons why Willis is considered one of the early figures in cognitive neuroscience EXCEPT:
  - a. He named many brain parts.
  - b. He gave frequent lectures on specific brain regions.
  - c. He was among the first to link behavioral deficits to brain damage.
  - d. He created very accurate brain images.

ANS:	В	DIF:	Medium	REF:	1.1 A Historical Perspective
OBJ:	1.1	MSC:	Remembering		

- - a. cognition; cognitive neuroscienceb. survival; evolutionc. blood flow; magnetic resonance imagingd. dysfunction; psychopathology
  - ANS: B DIF: Difficult REF: 1.1 A Historical Perspective

OBJ: 1.1 MSC: Analyzing

5. Which stance would most likely hold an assumption that physical elements of the brain are responsible for the conscious mind?

brain

	<ul><li>a. monism</li><li>b. behaviorism</li></ul>		c. d.	dualism relativism
	ANS: A OBJ: 1.1	DIF: Medium MSC: Analyzing	REF:	1.1 A Historical Perspective
6.	René Descartes posit structure, the pineal g a. regulating feelin b. connecting the r	ted that the mind was gland, as having what ags and emotions nind and the body	separate function c. d.	from the body. However, he implicated a single ? moderating cognitive processes adjusting behavior
	ANS: B OBJ: 1.1	DIF: Easy MSC: Rememberin	REF:	1.1 A Historical Perspective
7.	Considering the pers following would bes a. learning and rew b. integration with	pective recommended t explain how a cogni vard technology	l for appr tive func c. d.	roaching cognitive neuroscience, which of the tion may have developed? neurological dysfunction hunting and gathering
	ANS: D OBJ: 1.1	DIF: Difficult MSC: Analyzing	REF:	1.1 A Historical Perspective
8.	A central issue of mo a. arise from netwo b. are determined b c. are best studied d. can be best iden	odern cognitive neuro orks of brain areas we by the shape and size using the scientific m tified using the Golgi	science is orking tog of the hu lethod. silver me	s whether specific human cognitive abilities gether. man skull or the brain beneath. ethod of staining or fMRI.
	ANS: A	DIF: Medium	REF:	1.2 The Brain Story

9. The discipline of phrenology was founded by

MSC: Understanding

OBJ: 1.2

a. b.	Broca and Wern Fritsch and Hitzi	icke. g.		c. d.	Ramón y Cajal and Sherrington. Gall and Spurzheim.
AN	IS: D	DIF:	Easy	REF:	1.2 The Brain Story
OB	J: 1.2	MSC:	Remembering		

- 10. Phrenologists believed that the contour of the skull could provide valuable information about an individual's cognitive capacities and personality traits. This approach was based on the assumption that
  - a. skull protrusions are caused by disproportionate development of the brain areas beneath them, which are responsible for different specific functions.
  - b. certain traits such as aggressiveness lead to life experiences and injuries that alter the shape of the skull in specific ways.
  - c. life experiences and injuries that alter the shape of the skull in specific ways lead to certain traits, such as aggressiveness.
  - d. the development of the skull bones directly influences the configuration of the soft brain areas beneath them, which are responsible for different specific functions.

ANS:	А	DIF:	Difficult	REF:	1.2 The Brain Story
OBJ:	1.2	MSC:	Evaluating		

11. Localizationist is to \_\_\_\_\_\_ as holistic is to \_\_\_\_\_\_.

<ul><li>a. Wernicke; Gall</li><li>b. Gall; Flourens</li></ul>			с. d.	Flourens; Broca Broca; Wernicke
ANS: B OBJ: 1.2	DIF: MSC:	Medium Understanding	REF:	1.2 The Brain Story

- 12. Gall's method for investigating phrenology was flawed because
  - a. he used the wrong language to explain the characteristics he observed.
  - b. he did not tell Napoleon Bonaparte that he possessed noble characteristics.
  - c. he sought only to confirm, not disprove, the correlations he observed.
  - d. he used his own skull as the base model.

ANS:	С	DIF:	Easy	REF:	1.2 The Brain Story
OBJ:	1.2	MSC:	Remembering		

13. The view known as *aggregate field theory*, which stated that the whole brain participates in behavior, is most associated with

a.	B	roca.			с.	Brodmann.
b.	Η	ughlings Jackso	on.		d.	Flourens.
AN	S:	D	DIF:	Easy	REF:	1.2 The Brain Story
OB.	J:	1.2	MSC:	Remembering		

- 14. The key observation leading John Hughlings Jackson to propose a topographical organization in the cerebral cortex was that
  - a. speech disturbances could be identified by left-hemisphere lesions.
  - b. the two hemispheres of the brain served different functions.
  - c. seizures begin in a localized region of the cortex.
  - d. focal brain damage causes specific behavioral deficits.

ANS:	С	DIF:	Difficult	REF:	1.2 The Brain Story
OBJ:	1.2	MSC:	Analyzing		

- 15. In developing phrenology, Gall's main failure was that
  - a. he did not seek disconfirming evidence.
  - b. he was not a scientist.
  - c. his method was correlational.
  - d. All of the answer options are correct.

ANS:	D	DIF:	Difficult	REF:	1.2 The Brain Story
OBJ:	1.2	MSC:	Analyzing		

- 16. Giovanni visits his local phrenologist. What is this person likely to tell him?
  - a. You are a domineering person.
  - b. Your father was a very domineering person.
  - c. Your brother is a domineering person.
  - d. Your mother was a very domineering person.

ANS: A DIF: Medium REF: 1.2 The Brain Story

OBJ: 1.2 MSC: Applying

17. The view developed by Marie Jean Pierre Flourens, based on the idea that processes like language and memory cannot be localized within circumscribed brain regions, was known as a. the neuron doctrine. c. rationalism. b. aggregate field theory. d. the law of effect. REF: 1.2 The Brain Story ANS: B DIF: Easy OBJ: 1.2 MSC: Remembering 18. John Hughlings Jackson proposed a organization in the cerebral cortex, based on his work with people with a. holistic; aphasia c. topographic; epilepsy d. holistic; epilepsy b. topographic; aphasia ANS: C DIF: Medium REF: 1.2 The Brain Story OBJ: 1.2 MSC: Understanding 19. \_\_\_\_\_ was one of the first brain scientists to realize that specific cognitive functions can be localized to specific parts of the brain and that many different functional regions can take part in a given behavior. c. Flourens a. Broca b. Hughlings Jackson d. Brodmann ANS: B DIF: Medium REF: 1.2 The Brain Story OBJ: 1.2 MSC: Remembering 20. Which 19th-century scientist suggested that the frontal lobe contributes to language and speech production? a. Flourens c. Broca b. Wernicke d. Brodmann ANS: C DIF: Medium REF: 1.2 The Brain Story OBJ: 1.2 MSC: Remembering 21. Patient Leborgne was nicknamed "Tan" because that was the only word he could utter. Leborgne had developed an aphasia due to a lesion in which area of the brain? a. frontal cortex c. cerebellum b. Broca's area d. Wernicke's area ANS: B DIF: Easy REF: 1.2 The Brain Story OBJ: 1.2 MSC: Remembering 22. Which of the following things would have been the most difficult for the famous individual studied by Paul Broca to do, compared to before his stroke? a. listening to a piano recital c. reading a book aloud b. appreciating a painting d. playing a game of cards ANS: C DIF: Medium REF: 1.2 The Brain Story OBJ: 1.2 MSC: Applying 23. Which of the following things would have been the most difficult for the famous individual described by

Carl Wernicke to do, compared to before his stroke?

a. understanding a speech c. singing a song

	b. painting a pictu	ire	d.	riding a horse
	ANS: A OBJ: 1.2	DIF: Medium MSC: Applying	REF:	1.2 The Brain Story
24.	Wernicke was an ea comprehension.	rly researcher who sug	ggested tl	nat the contributes to language
	<ul><li>a. right frontotem</li><li>b. left frontotemp</li></ul>	poral area oral area	c. d.	right temporoparietal area left temporoparietal area
	ANS: D OBJ: 1.2	DIF: Medium MSC: Applying	REF:	1.2 The Brain Story
25.	Wernicke is toa. understanding s b. speaking; unde c. aggregate field d. aggregate field	as Broca is to speech; speaking rstanding speech theory; topographic of theory; aggregate field	ganizatio	on
	ANS: A OBJ: 1.2	DIF: Easy MSC: Rememberin	REF:	1.2 The Brain Story
26.	As a first approximation difficulty with	ation, individuals with , whereas individ with rol; the sense of touch uch; fine motor control of language; the percep of language; the produc	damage uals with ption of l ction of l	to the left inferior frontal lobe tend to have more a damage to the left posterior temporal lobe tend to anguage anguage
	ANS: C OBJ: 1.2	DIF: Medium MSC: Understandin	REF:	1.2 The Brain Story
27.	<ul> <li>One reason that early responsible for them</li> <li>a. most early investigators di 20th century.</li> <li>c. most early investigators di rather than in h</li> <li>d. there was little</li> </ul>	by research on specific in developed rather slow estigators were limited d not know the brain v estigators focused on st umans. interest in this field un	human c wly befor to postm vas separ udying tl util the 20	ognitive capacities and the brain areas that are the 20th century is that ortem studies to localize lesions. rated into two hemispheres until the he brain–behavior relationship in animals Oth century.
	ANS: A	DIF: Medium	REF:	1.2 The Brain Story

OBJ: 1.3 MSC: Understanding

28. Korbinian Brodmann used \_\_\_\_\_\_ techniques to document 52 regions of the brain that differed in \_\_\_\_\_\_.

a.	phrenological; cy	/toarchi	tectonics	c.	tissue staining; cytoarchitectonics
b.	phrenological; ch		etrics	d.	tissue staining; chronometrics
AN OB	S: C J: 1.3	DIF: MSC:	Easy Remembering	REF:	1.2 The Brain Story

- 29. Each of the following contributions led to the establishment of the neuron doctrine EXCEPT:
  - a. Golgi's silver method.
  - b. Purkinje's description of the first nerve cell.
  - c. Thorndike's observation of adaptive response.
  - d. Brodmann's cortical maps.

ANS:	С	DIF:	Medium	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Understanding	5	

- 30. Researchers Fritsch and Hitzig found support for the idea that specific functions are localized to discrete parts of the cortex in an experiment using electrical stimulation of a dog's brain. More specifically, they found \_\_\_\_\_\_ systematic relationship between the portion of the cortex stimulated and specific \_\_\_\_\_\_.
  - a. a; movements
  - b. a; vocalizations
  - c. no; movements
  - d. no; vocalizations

ANS:	А	DIF:	Medium	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Understanding	3	

- 31. Cytoarchitectonic maps distinguish different cortical regions by
  - a. the structure of their surface convolutions.
  - b. their structure at the cellular level.
  - c. the complex functions they perform.
  - d. the basic functions they perform.

ANS:	В	DIF:	Easy	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Remembering		

- 32. Yvette wants to figure out whether cells in two different layers of the occipital lobe have different functions. What would she have done if she had been a scientist in the early 20th century?
  - a. look at a CAT scan
  - b. observe the tracts that connect each layer
  - c. study living patients with damage to those cells
  - d. look at the layers under a microscope

ANS:	D	DIF:	Medium	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Applying		

33. The neuroanatomist who described 52 distinct cortical areas based on cell structure and arrangement, and whose classification scheme is often used today, was

a.	Purkinje.	c.	Brodmann.
b.	Helmholtz.	d.	Hyde.

ANS:	С	DIF:	Easy	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Remembering		

34. Which of the following terms refers to the idea of a continuous mass of tissue that shares a common cytoplasm?

a. synapse		c. striatum
b. syncytium		d. claustrum
ANS: B	DIF: Easy	REF: 1.2 The Brain Story

OBJ: 1.3 MSC: Remembering

- 35. La reazione nera, or "the black reaction," refers to
  - a. a cell stain developed by Golgi.
  - b. a perceptual phenomenon described by the Gestalt psychologists.
  - c. a ganglion preparation developed by Arvanitaki.
  - d. a type of reinforcement-based learning described by the behaviorists.

ANS:	А	DIF:	Easy	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Remembering		

36. Which of the following scientists contributed to modern neuroscience in the 19th century?

a.	Paul Broca			с.	Gustav Theodor Fritsch
b.	Sir Charles Sherr	rington		d.	Santiago Ramón y Cajal
AN	S: A	DIF:	Medium	REF:	1.2 The Brain Story
OB.	J: 1.3	MSC:	Remembering		

37. Which of the following statements best describes the "neuron doctrine"?

- a. The nervous system consists of a fused network of interconnected fibers.
- b. The brain can be subdivided into regions that are distinct in cytoarchitectonics yet functionally interactive.
- c. The nervous system consists of physically distinct cells that are functionally interactive.
- d. The brain can be subdivided into functionally autonomous modules.

ANS:	С	DIF:	Medium	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Understanding	5	

38. The neuron doctrine is usually credited to \_\_\_\_\_, who used a staining technique pioneered by

a. P	urkinje; Brodm	ann		с.	Golgi; Ramón y Cajal
b. B	Brodmann; Purki	inje		d.	Ramón y Cajal; Golgi
ANS: OBJ:	D 1.3	DIF: MSC:	Easy Remembering	REF:	1.2 The Brain Story

- 39. The primary contribution of Golgi to the field of cognitive neuroscience was that he
  - a. developed a staining technique that permitted full visualization of individual neurons.
  - b. showed experimentally that the nervous system is composed of a net of physically interconnected neuronal units.
  - c. discovered that cells in different regions of the cortex also differ in shape and size.
  - d. demonstrated that nerves can release chemicals that have an activating effect on nearby muscle cells.

ANS: A	DIF:	Medium	REF:	1.2 The Brain Story
OBJ: 1.3	MSC:	Understanding	5	

- 40. The term synapse, coined by Sherrington, refers to the junction between
  - a. a blood vessel and surrounding neurons.
  - b. two different cytoarchitectonic regions in the brain.
  - c. two adjacent neurons.
  - d. an axon and the cell body of a neuron.

ANS:	С	DIF:	Easy	REF:	1.2 The Brain Story
OBJ:	1.3	MSC:	Remembering		

- 41. *Rationalism* is the philosophical position that knowledge
  - a. originates from sensory experience.
  - b. must be experimentally tested.
  - c. must be deduced and justified through reason.
  - d. is globally distributed in the cortex.

ANS:	С	DIF:	Easy	REF:	1.3 The Psychological Story
OBJ:	1.4	MSC:	Remembering		

- 42. *Empiricism* is the philosophical position that all knowledge
  - a. must be deduced and justified through reason.
  - b. originates from sensory experience.
  - c. must be experimentally tested.
  - d. is globally distributed in the cortex.

ANS:	В	DIF:	Easy	REF:	1.3 The Psychological Story
OBJ:	1.4	MSC:	Remembering		

43. Which of the following is NOT true of empiricism?

- a. It is primarily associated with the British philosophers Hobbes, Hume, and Mill.
- b. It was a foundation for the associationist-behaviorist school of psychology.
- c. It postulates a special role for reason and induction in human thought.
- d. It emphasizes sensory experience in the development of knowledge.

ANS:	С	DIF:	Medium	REF:	1.3 The Psychological Story
OBJ:	1.4	MSC:	Understanding	ŗ.	

- 44. Ebbinghaus, who is considered the father of modern memory research, was among the first to demonstrate that
  - a. different types of brain lesions can produce different types of memory deficits.
  - b. in terms of cognition, the whole is greater than the sum of its parts.
  - c. behavior is best understood in terms of stimulus-response relationships.
  - d. internal mental processes can be measured in rigorous and reproducible ways.

ANS:	D	DIF:	Difficult	REF:	1.3 The Psychological Story
OBJ:	1.4	MSC:	Analyzing		

- 45. All of the following are representative of the emergence of the field of cognitive science in the second half of the 20th century EXCEPT
  - a. new developments in computer technology and artificial intelligence.
  - b. a philosophical shift in the field toward empiricism and associationism.
  - c. Chomsky's work arguing that behaviorist theories cannot explain language acquisition.
  - d. Miller's work showing that internal processes like short-term memory can be quantified.

ANS:	В	DIF:	Difficult	REF:	1.3 The Psychological Story
OBJ:	1.4	MSC:	Evaluating		

- 46. Thorndike's law of effect
  - a. stated that much knowledge is innately specified due to natural selection.
  - b. was written to oppose Darwin's theory of natural selection.

- c. stated that a behavior that is followed by a reward is likely to occur again.
- d. was written to oppose the behaviorists.

ANS:	С	DIF:	Easy	REF:	1.3 The Psychological Story
OBJ:	1.5	MSC:	Remembering		

47. \_\_\_\_\_\_ is the idea that all knowledge comes from sensory experiences, while \_\_\_\_\_\_

holds that truth is intellectual.

- a. Empiricism; rationalism
- b. Empiricism; logic
- c. Rationalism; empiricism
- d. Rationalism; logic

ANS: ADIF: MediumREF: 1.3 The Psychological StoryOBJ: 1.5MSC: Understanding

- 48. John Watson famously argued that newborn babies
  - a. are incapable of forming memories.
  - b. have an intelligence comparable to our nearest primate cousins.
  - c. can be raised to become anything.
  - d. will develop different intellectual abilities according to innate differences.

ANS:	С	DIF:	Difficult	REF:	1.3 The Psychological Story
OBJ:	1.5	MSC:	Analyzing		

- 49. According to associationist Herman Ebbinghaus, complex processes such as memorya. can be understood by combining different pieces of information.
  - b. are best understood by combining different precess of information.
  - c. cannot be measured because they are not behaviors.
  - d. can be measured in an analytic fashion.

ANS: D	DIF:	Difficult	REF:	1.3 The Psychological Story
OBJ: 1.4	MSC:	Evaluating		

- 50. According to Edward Thorndike, which of the following is NOT true about rewards?
  - a. They indicate which creatures have malleable structures in the brain.
  - b. They help to stamp things into the mind.
  - c. They lead to adaptive learning.
  - d. They are part of the law of effect.

ANS:	А	DIF:	Difficult	REF:	1.3 The Psychological Story
OBJ:	1.5	MSC:	Evaluating		

- 51. "Cells that fire together, wire together" was first proposed by Donald Hebb as an explanation for
  - a. epileptic seizures and their effects.
  - b. cytoarchitectural variation.
  - c. the way in which the brain codes new learning.
  - d. amnesia caused by brain damage.

ANS:	С	DIF:	Medium	REF:	1.3 The Psychological Story
OBJ:	1.5	MSC:	Understanding	5	

52. Noam Chomsky argued that the structure of human languages is \_\_\_\_\_, in contrast to

	<ul><li>B. F. Skinner's assert</li><li>a. innate; learned</li><li>b. learned; universa</li></ul>	tion tha al	t languages are	c. d.	 universal; rational rational; innate	
	ANS: A OBJ: 1.6	DIF: MSC:	Easy Remembering	REF:	1.3 The Psychological Story	
53.	Which of the followi latter part of the 20th a. Noam Chomsky b. Sir Charles Sher	ng peop century rington	ole did NOT pla y?	ay a stro c. d.	ong role in the theoretical shift in psychology in the George A. Miller Claude Shannon	
	ANS: B OBJ: 1.6	DIF: MSC:	Easy Remembering	REF:	1.3 The Psychological Story	
54.	<ul><li>Which of the followi</li><li>a. measuring contin</li><li>b. studying patients</li><li>c. making photogra</li><li>d. publishing a pap</li></ul>	ng was nuous a s who h aphic re er desci	NOT contribute ctivity from the ad skull defects cordings of act ribing recording	ory to t e cerebr s ivity fro gs of br	he development of the electroencephalogram? al cortex of dogs and apes om a string galvanometer ain currents	
	ANS: B OBJ: 1.7	DIF: MSC:	Difficult Analyzing	REF:	1.4 The Instruments of Neuroscience	
55.	You decide that you employ to best achiev a. Listen to the blo b. Look at red bloo c. Measure the amo d. None of the answ	want to ve your od flow d cells ount of wer opti	measure blood goal? across veins. under a microso iron in the bloo ons is correct.	flow o cope. d.	f the brain. Which of the following methods would you	
	ANS: D OBJ: 1.7	DIF: MSC:	Medium Applying	REF:	1.4 The Instruments of Neuroscience	
56.	Computerized axial t a. X-ray; radio free b. structure; functio	omogra juencies on	phy is to MRI a s	as c. d.	is to blood oxygenation; X-ray radiation; dipoles	
	ANS: A OBJ: 1.7	DIF: MSC:	Medium Analyzing	REF:	1.4 The Instruments of Neuroscience	
57.	<ul> <li>Which of the following methods relies on blood oxygenation?</li> <li>a. magnetic resonance imaging</li> <li>b. functional magnetic resonance imaging</li> <li>c. computerized axial tomography</li> <li>d. electroencephalogram</li> </ul>					
	ANS: B	DIF:	Medium	REF:	1.4 The Instruments of Neuroscience	

OBJ: 1.7 MSC: Understanding

58. Suppose you are investigating neurological function, and one of the initial portions of your procedure is to inject radioactive oxygen-15 into the patient's bloodstream. Which of the following methods are you most likely using to measure neurological activity?

a.	electroencephalography (EEG)				positron emission tomography (PET)
b.	computerized axial tomography (CAT)			d.	magnetic resonance imaging (MRI)
AN OB	S: C J: 1.7	DIF: MSC:	Difficult Applying	REF:	1.4 The Instruments of Neuroscience

59. A group of investigators is conducting research on brain tumors, and they need to obtain threedimensional brain views to localize the tumors. Which instrument will provide the least invasive way to obtain their objective?

a.	electroencephalography (EEG)				positron emission tomography (PET)
b.	computerized as	kial tom	ography (CAT)	d.	magnetoencephalography (MEG)
AN	S: B	DIF:	Difficult	REF:	1.4 The Instruments of Neuroscience
OB.	J: 1.7	MSC:	Applying		

60. Imagine that you are one of the researchers who advanced the field of cognitive neuroscience by developing a new instrument to measure the brain. Computerized axial tomography (CAT) has already been developed, but your team wants to expand the CAT to develop an instrument that will provide information about brain function. Which method are you most likely developing?

a. electroencephalography (EEG)
b. functional magnetic resonance imaging (fMRI)
c. positron emission tomography (PET)
d. magnetic resonance imaging (MRI)

ANS:	С	DIF:	Difficult	REF:	1.4 The Instruments of Neuroscience
OBJ:	1.7	MSC:	Applying		

# SHORT ANSWER

1. Draw a diagram demonstrating the approach known as the scientific method. Your diagram should indicate the general procedures used and the order in which they are performed.

### ANS:

Answers will vary. Each should include the following:

- make an observation
- ask why it came about
- form a hypothesis
- design and perform an experiment
- draw a conclusion
- may also include replication

DIF: Difficult REF: 1.1 A Historical Perspective OBJ: 1.1 MSC: Creating

2. Describe how and why the term *cognitive neuroscience* was chosen for this field. Be sure to mention the two fields that combined to create this new field of study.

ANS: Answers will vary.

DIF: Easy REF: 1.1 A Historical Perspective OBJ: 1.4 MSC: Remembering

3. Localizationists argued that higher cognitive functions were the product of brain activity in specific areas. Give evidence that they used to support their claims.

ANS: Answers will vary. REF: 1.2 The Brain Story OBJ: 1.1 DIF: Easy MSC: Remembering 4. Paul Broca and Carl Wernicke discovered two different forms of aphasia. Compare and contrast them. ANS: Answers will vary. OBJ: 1.2 DIF: Medium REF: 1.2 The Brain Story MSC: Understanding 5. Describe the main tenets of the Neuron Doctrine. ANS: Answers will vary. REF: 1.2 The Brain Story OBJ: 1.2 DIF: Easy MSC: Remembering 6. Describe the evidence that led Marie-Jean-Pierre Flourens to move the field away from localization toward aggregate-field theory. ANS: Answers will vary. DIF: Easy REF: 1.2 The Brain Story OBJ: 1.2 MSC: Remembering 7. A major question in cognitive neuroscience is the extent to which regions of the brain are independent or integrated. Which of these two viewpoints is most valid? Present evidence to support your view. ANS: Answers will vary. OBJ: 1.2 DIF: Difficult REF: 1.2 The Brain Story MSC: Evaluating 8. Associationism and empiricism are two main philosophical positions. Pick the one you think best describes how humans come to know things and explain why you think this. ANS:

Answers will vary.

DIF: Medium REF: 1.3 The Psychological Story OBJ: 1.4

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MSC: Remembering

9. Describe the transition from behaviorist to cognitive approaches in psychology.

ANS: Answers will vary.

DIF: Easy REF: 1.3 The Psychological Story OBJ: 1.4 MSC: Understanding

10. Noam Chomsky wrote an article titled "Three Models for the Description of Language." Describe how the findings he reported moved the field of cognitive psychology forward.

ANS: Answers will vary.

DIF: Medium REF: 1.3 The Psychological Story OBJ: 1.4 MSC: Remembering

11. Describe two principal methods used to measure brain structure.

ANS: Answers will vary.

DIF: EasyREF: 1.4 The Instruments of NeuroscienceOBJ: 1.7MSC: Remembering

12. You would like to understand at what point in time an event took place in the brain. What neuroimaging method would you choose? Explain why you would choose this method and what information you would be missing.

ANS: Answers will vary.

DIF: Easy REF: 1.4 The Instruments of Neuroscience OBJ: 1.7 MSC: Understanding