

of the brain is responsible for our inhibitions, ability to plan for future events, and regulation of emotions.

Psychologists have also studied animals and people with brain lesions. A **lesion**, *tissue damage resulting from disease*, in the brain has been shown to alter proper cognitive functioning. Studies indicate that lesions in young animals and human beings may ultimately have little or no effect on the cognitive functioning of the individual, thanks to the **plasticity**, *changes that occur in the brain due to environmental factors*, of the human brain.

Multiple-Choice Questions

1. The area of the brain essential to the formation of long-term explicit memories is
 - (A) the pineal gland
 - (B) the hypothalamus
 - (C) the thalamus
 - (D) the hippocampus
 - (E) the pituitary gland
2. While running a marathon, Emily experienced an increase in the body's natural painkiller. Which of the following chemicals has been associated with the alleviation of pain?
 - (A) Serotonin
 - (B) GABA
 - (C) Melatonin
 - (D) Endorphins
 - (E) Acetylcholine
3. A person who has lesions on his brain is having difficulty verbalizing complete or coherent sentences. This person most likely suffered damage to what part of the brain?
 - (A) Broca's area
 - (B) Wernicke's area
 - (C) Motor cortex
 - (D) Auditory cortex
 - (E) Somatosensory cortex
4. The fact that a neuron either fires at full strength or does not fire at all is the result of which of the following?
 - (A) Depolarization
 - (B) All-or-nothing principle
 - (C) Level of excitation
 - (D) Refractory period
 - (E) Axon hillock processing
5. Dr. Dolan is interested in studying short-term memory and the role of the prefrontal cortex in related tasks. Which of the following techniques would he most likely use to determine whether the prefrontal cortex is involved in short-term memory?
 - (A) Positive emissions tomography (PET) scan
 - (B) Electroencephalograph (EEG)
 - (C) Magnetic resonance imaging (MRI) scan

- (D) Computed tomography (CT or CAT) scan
 (E) Transcranial magnetic stimulation (TMS)
6. Underproduction of _____ has been associated with Alzheimer's disease, whereas underproduction of _____ has been associated with Parkinson's disease.
 (A) dopamine; acetylcholine
 (B) serotonin; GABA
 (C) acetylcholine; dopamine
 (D) norepinephrine; dopamine
 (E) acetylcholine; serotonin
7. Acetylcholine appears to play a vital role in the formation of long-term memories. It is reasonable to conclude that which area of the brain is most likely affected by Alzheimer's disease?
 (A) Amygdala
 (B) Hypothalamus
 (C) Hippocampus
 (D) Corpus callosum
 (E) Thalamus
8. Olds and Milner (1954) concluded that which area of the brain is responsible for producing the neurotransmitter dopamine and has thus been given the distinction of being the brain's "pleasure center"?
 (A) The limbic system
 (B) The auditory cortex
 (C) Broca's area
 (D) Wernicke's area
 (E) The reticular activating system
9. After having his corpus callosum severed, Juan would most likely experience which of the following problems?
 (A) An inability to form complete and coherent sentences
 (B) An inability to plan for future events
 (C) An inability to distinguish where a sound is coming from
 (D) An inability to control smooth bodily movements
 (E) An inability to correctly identify an object while holding it in his left hand
10. An excess of which neurotransmitter has been associated with schizophrenia, while a deficiency of the same neurotransmitter has been associated with Parkinson's disease?
 (A) Serotonin
 (B) Melatonin
 (C) Dopamine
 (D) GABA
 (E) Acetylcholine
11. The deterioration of myelin, causing leakage of electrical activity within the axon, has been associated with which neurological disorder?
 (A) Parkinson's disease
 (B) Alzheimer's disease
 (C) Muscular dystrophy
 (D) Multiple sclerosis
 (E) Huntington's disease

12. Which of the following is the result of the activation of the sympathetic nervous system?
 - (A) Your palms are dry.
 - (B) Your mouth is wet with saliva.
 - (C) Your digestive system is processing food.
 - (D) Your heartbeat is elevated.
 - (E) Your respiration rate is lowered.
13. Which of the following is an example of the functioning of the somatic nervous system?
 - (A) Dana just finished lunch, and her digestive system is working to process the food.
 - (B) Feelings of embarrassment caused Alex's face to turn red.
 - (C) While he was running, Steve's heart rate increased.
 - (D) Aleshia began to perspire when she thought about her upcoming test.
 - (E) Karly picked up her pencil after it had fallen to the floor.
14. Brittney's ability to maintain balance during a dance routine is due to the functioning of which areas of the brain?
 - (A) Temporal and frontal lobes
 - (B) Frontal and occipital lobes
 - (C) Cerebellum and temporal lobe
 - (D) Occipital and temporal lobes
 - (E) Cerebellum and occipital lobe
15. Tim is fifteen years old and seven feet tall. His parents are both about five-and-a-half-feet tall. Tim's height is most likely due to an
 - (A) overactive pineal gland
 - (B) underactive pituitary gland
 - (C) overactive pituitary gland
 - (D) underactive thyroid gland
 - (E) overactive thyroid gland

Free-Response Questions

1. Describe the effects of brain damage on each of the following regions of the brain.
 - (a) Frontal lobe
 - (b) Temporal lobe
 - (c) Occipital lobe
 - (d) Parietal lobe