**Test Bank**

to accompany

*Cognition,* First Edition

Chun • Most

**Chapter 7**

***Memory Systems***

**Multiple Choice**

1. Anterograde amnesia is the inability to remember

a. anything post-surgery, but the ability to remember things prior to surgery.

b. anything prior to surgery, but the ability to remember things post-surgery.

c. skills, but not facts.

d. facts, but not skills.

e. anything at all.

*Answer:* a

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 1. Remembering

2. One of the most significant findings about memory systems that working with the patient HM revealed was

a. the discovery of retrograde amnesia.

b. the discovery of anterograde amnesia.

c. a clear distinction between anterograde and retrograde amnesia.

d. there are different types of memories.

e. that once someone learns something, it is always present; it is just a matter of retrieving (unforgetting) it.

*Answer:* d

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 2. Understanding

3. Most likely you remember what you were doing and where you were on September 11, 2001. This is an example of

a. semantic memory.

b. episodic memory.

c. priming.

d. procedural memory.

e. statistical learning.

*Answer:* b

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

4. Which type of memory is the most durable through time?

a. Episodic memory

b. Semantic memory

c. Priming

d. Statistical learning

e. Procedural memory

*Answer:* e

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

5. Some of our earliest memories are

a. episodic.

b. semantic.

c. procedural.

d. priming.

e. contextual cuing.

*Answer:* a

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 2. Understanding

6. In Alzheimer’s disease, the accumulation of plaques and tangles results in nonfunctioning and, therefore, dying neurons. From a tissue perspective, compared to healthy same-aged brain, this results in

a. more, but less functional, brain tissue.

b. much less brain tissue.

c. much less blood circulation in the brain.

d. impaired communication.

e. fewer spaces between neurons.

*Answer:* b

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

7. Neurons die if they cannot perform their initial and primary function of

a. keeping the body alive.

b. allowing all autonomic functions to remain active.

c. allowing the animal to learn, think and remember.

d. allowing the animal to metabolize nutrients.

e. communicating with other cells.

*Answer:* e

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

8. If Alzheimer’s disease runs in your family, one thing that you could do to help decrease the probability that you will get it would be to

a. undergo gene therapy to fix the mutation that runs in your family.

b. go back to school to earn a diploma or degree.

c. avoid stress.

d. eat mostly healthy foods and exercise regularly.

e. manage diabetes and cardiovascular disease, if applicable.

*Answer:* d

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 1. Remembering

9. Which of the following about Alzheimer’s disease is true?

a. It tends to impact mostly explicit memory.

b. It tends to impact mostly implicit memory.

c. It tends to cause a decline only in the ability to learn new things, but older memories remain largely unaffected.

d. It tends to cause a decline only in the ability to remember old things, but the ability to acquire and retain new abilities and memories remains largely unaffected.

e. Time is the critical factor: The later in life you get it, the milder it tends to be.

*Answer:* c

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 2. Understanding

10. In the *remember/know* procedure, during the study phase, which of the following lists of five words would be best in distinguishing between familiarity and recognition?

a. Orange, car, table, star, rock

b. Horse, spoon, table, chair, sand

c. Honda, Toyota, Ford, Hyundai, Nissan

d. Apple, dog, cat, grape, sky

e. Star, moon, bed, shoe, hair

*Answer:* c

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 5. Evaluating

11. A devoted wife has no interest in sports, while her husband is an avid sports fan. To be supportive, she often attends games with him. During these times she brings a book along to while away the hours, occasionally stopping to look and listen to the game. After several seasons of this, she knows all the rules and even some of the names of the key players. This is an example of

a. explicit memory.

b. statistical learning.

c. priming.

d. contextual cuing.

e. procedural learning.

*Answer:* c

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

12. Which of the following is the best example of associative priming when participants are presented with the word “cat”?

a. Participants are asked to name something that rhymes with “cat.”

b. Participants are asked to name something furry.

c. Participants are asked to name another animal spelled with three letters.

d. Participants are asked to name another animal that is also a pet.

e. Participants are asked to name another mammal.

*Answer:* d

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 5. Evaluating

13. In repetition suppression, repeated presentation of the same stimuli results in less fMRI signal than stimuli presented only once does. This indicates that

a. the brain is getting used to the stimuli, so less effort or work is required.

b. the relevant perceptual area of the brain is getting used to the stimuli, so less effort or work is required.

c. statistical learning is occurring.

d. priming is occurring.

e. the parts of the brain involved in conceptual priming are different from those involved in perceptual priming.

*Answer:* b

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 4. Analyzing

14. A professor learns the names and faces of all the students in her course. This is an example of

a. semantic memory.

b. explicit memory.

c. implicit memory.

d. contextual learning.

e. perceptual learning.

*Answer:* a

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

15. You just finished reading this chapter on memory. Unfortunately, you do not remember a thing. Which kind of memory or learning should you rely on first to begin understanding the concepts contained therein?

a. Priming

b. Procedural learning

c. Semantic memory

d. Episodic memory

e. Contextual cuing

*Answer:* c

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

16. Which type of memory necessarily requires motor commands?

a. Semantic

b. Procedural

c. Priming

d. Statistical learning

e. Contextual cuing

*Answer:* b

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 1. Remembering

17. Which type of learning requires some kind of “hint” beforehand?

a. Procedural

b. Semantic

c. Priming

d. Contextual cuing

e. Perceptual cuing

*Answer:* c

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 2. Understanding

18. If learning another language, to which of the following would statistical learning be most applicable (assuming English is your native language)?

a. German

b. Spanish

c. French

d. Russian

e. Chinese

*Answer:* e

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

19. Which of the following is an example that violates the principle of contextual cuing?

a. Dirty dishes in a kitchen sink

b. Towels in a bathroom

c. A desk in a home office

d. A flat-screen TV in the bathroom

e. Books in the kitchen

*Answer:* d

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

20. If you were to scan the brain with fMRI during a contextual cuing experiment, you would find

a. increased metabolic activity in the visual perceptual area when shown novel displays.

b. increased metabolic activity in the visual perceptual area when shown repeated displays.

c. decreased metabolic activity in the visual perceptual area when shown novel displays.

d. decreased metabolic activity in the visual perceptual area when shown repeated displays.

e. higher metabolic activity throughout the visual perceptual area whether displays are novel or repeated.

*Answer:* d

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 4. Analyzing

21. In the serial position experiment, about 20 words are presented. What would happen to the primacy and/or recency effects if the list were shortened to about half (i.e., about 10 words)?

a. Primacy effect would increase.

b. Primacy effect would decrease.

c. Recency effect would increase.

d. Recency effect would decrease.

e. Neither primacy nor recency effects would be significantly affected.

*Answer:* a

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 4. Analyzing

22. In the serial position experiment, about 20 words are presented. What would happen to the shape of the curve if the list were shortened to about half (i.e., about 10 words)?

a. Primacy effect would increase.

b. Primacy effect would decrease.

c. Recency effect would increase.

d. Recency effect would decrease.

e. Clear distinction between primacy and recency effects, difference between long-term memory and short-term memory, respectively, would become blurred.

*Answer:* e

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 4. Analyzing

23. Long-term memories are most likely stored

a. in the hippocampus.

b. in the medial temporal lobe.

c. in the hippocampal system.

d. throughout the brain, depending on the type of information (visual, auditory, sematic, etc.) was first encoded.

e. in the neocortex, depending on the type of information (visual, auditory, semantic, etc.) was first encoded.

*Answer:* e

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

24. Recalling memories depends on the

a. hippocampus and medial temporal lobe reinforcing each other through high-frequency action potentials.

b. hippocampus sending action potentials to the medial temporal lobe, which, in turn, sends signals action potentials to the neocortex.

c. hippocampal system associating (i.e., firing action potentials) to the relevant neocortical area (e.g., visual cortex if presented with visual information).

d. neocortex feeding action potentials to the relevant part of the hippocampal system (e.g., seeing a face [visual cortex] sending action potentials to the face area).

e. neocortex associating (i.e., firing action potentials) among each other, thereby reinforcing the encoding of old memories.

*Answer:* c

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

25. Forming new memories depends on the

a. hippocampus and medial temporal lobe reinforcing each other through high-frequency action potentials.

b. hippocampus sending action potentials to the medial temporal lobe, which, in turn, sends signals action potentials to the neocortex.

c. hippocampal system associating (i.e., firing action potentials) to the relevant neocortical area (e.g., visual cortex if presented with visual information).

d. neocortex feeding action potentials to the relevant part of the hippocampal system (e.g., seeing a face [visual cortex] sends action potentials to the face area).

e. neocortex associating (i.e., firing action potentials) among each other, thereby reinforcing the encoding of new memories.

*Answer:* d

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

26. Communication between the neocortices and hippocampus is

a. bidirectional.

b. hippocampus-to-neocortices only.

c. neocortices-to-hippocampus only.

d. hippocampus-to-neocortices only if the information is meaningful.

e. neocortices-to-hippocampus only if the information is meaningful.

*Answer:* a

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

27. It is easier for someone who knows Japanese to learn more Japanese words than it is for someone who knows little to no Japanese (novice). Mechanistically, this is because

a. to the novice, Japanese words hold zero-to-little meaning.

b. Japanese language is not interesting to the novice.

c. the experienced speaker has the relevant stronger neural connections that have been established long ago when (s)he was learning the language.

d. Japanese has greater relevance for the experienced speaker.

e. the experienced speaker has stronger neural pathways for languages in general.

*Answer:* c

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 3. Applying

28. Which of the following explains “consolidation”?

a. Strengthening memories

b. Strengthening synapses

c. Strengthening long-term potentiation

d. Strengthening and enlarging the hippocampus

e. Strengthening neocortices

*Answer* b

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

29. A major reason why consolidation is a slow process is because

a. memory formation is susceptible to distractions.

b. new memories are extremely fragile and vulnerable to trauma and/or drugs.

c. the chemicals that cross the synapse are subject to degradation.

d. synapses themselves are easily degraded and therefore must be constantly re-formed.

e. the effects of experiences take time to accumulate.

*Answer:* e

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 4. Analyzing

30. Long-term potentiation is actually a laboratory term used to describe

a. hippocampal activity.

b. neocortical activity.

c. memory consolidation.

d. memory retrieval.

e. plasticity.

*Answer:* e

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

31. Which of the following is essential for consolidation to occur?

a. Repeated rehearsal of new information

b. New information must be relatively simple (uncomplicated).

c. New information must be meaningful and relevant.

d. Rapid-eye movement (REM) sleep

e. Deep sleep

*Answer:* d

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 1. Remembering

32. As most college students know, it is rarely a good idea to sleep-deprive yourself (pull an “all-nighter”) to study for an exam. Why?

a. Too much studying results in over-consolidation of memories.

b. Sleep deprivation means there is little to no consolidation of the information that you are trying to retain.

c. Too many distractions occur during such “all-nighters.”

d. Sleep deprivation hinders the body from fully performing all bodily functions.

e. Sleep deprivation means that consolidation occurs too rapidly, instead of slowly like it should.

*Answer:* b

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

33. Long-term potentiation occurs primarily in the

a. hippocampus.

b. medial temporal lobe.

c. lateral parietal cortex.

d. frontal cortex.

e. prefrontal cortex.

*Answer:* a

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 1. Remembering

34. In terms of true memories versus false memories, fMRI studies can determine

a. which memories are true, and which are false.

b. the relative activity levels of various brain areas only.

c. the relative activity levels of various brain areas during attempted recall.

d. how strong the participant is in his/her conviction that a memory is true.

e. where different types of memories are located in the brain.

*Answer:* d

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

35. One major reason why the brain is purported to hold an unlimited amount of information is because of population coding. This means that

a. the approximately 10 billion neurons (and 100 billion glial cells) each hold a specific memory for a particular thing, place, face, etc.

b. different combinations of neurons participate in a conduit that fires synchronously.

c. different combinations of neurons either fire or do not fire, participating in a conduit that ultimately results in memory (re)activation.

d. the hippocampus and associated cortices are in alternating states of “on” versus “off” during memory retrieval.

e. the various cortices are in alternating states of “on” versus “off” during memory retrieval.

*Answer:* c

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 4. Analyzing

36. You still recognize the face of your best friend, whether he or she is wearing glasses, has make-up on, grows a beard, or just got a tan. Why?

a. A single neuron in the face area is firing.

b. A single group of neurons in the face area is firing.

c. A single group of neurons in the face area and associated visual perceptual cortical areas are all firing together.

d. A single group of neurons in the face area and associated visual perceptual cortical areas are firing at different times and at different intensities, depending on the stimulus (altered friend’s face).

e. A single group of neurons in the visual neocortex is firing at varying intensities and sending these to the face area.

*Answer:* d

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 3. Applying

37. Time spent being clinically depressed is

a. proportional to the size of the hippocampus.

b. proportional to the size of the neocortex.

c. inversely proportional to the size of the hippocampus.

d. inversely proportional to the size of the neocortex.

e. unrelated to the size of the hippocampus.

*Answer:* c

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

38. If you have ever experienced a moderately long bout of clinical depression, you may remember that you often found it difficult to concentrate and remember things. This is because of too much

a. post-traumatic stress disorder (PTSD).

b. stimulation to the hippocampus.

c. cortisol, which damages the hippocampus.

d. cortisol, which damages the neocortices.

e. cortisol, which damages the hippocampal system.

*Answer:* c

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 3. Applying

39. Depression may present with lack of behavioral activity, such as apathy, while stress may indicate heightened awareness or anxiety. Thus, although clinically, depression and stress are not the same thing, they are both correlated with decreased hippocampal size. This indicates that

a. depression and stress are genetically the same thing.

b. depression and stress both result in the same hormones and neurotransmitters being released.

c. depression and stress are just different phases of the same mood disorder.

d. depression can become stress.

e. stress can become depression.

*Answer:* c

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

40. Awareness of one’s environmental location causes which cells to fire?

a. Visual cortical cells

b. Hippocampal place cells

c. Medial temporal lobe cortical cells

d. Lateral parietal cortex cells

e. Hippocampal neurons

*Answer:* b

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 2. Understanding

41. Viewing one’s environmental location causes which cells to fire first?

a. Visual cortical cells

b. Hippocampal place cells

c. Medial temporal lobe cortical cells

d. Retinal photoreceptor cells

e. Entorhinal cortical cells

*Answer:* d

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 2. Understanding

42. As a person starts to move around in the environment, which cells increase their activity?

a. Visual cortical cells

b. Hippocampal place cells

c. Entorhinal grid cells

d. Medial temporal lobe cells

e. Parahippocampal place area cells

*Answer:* c

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 2. Understanding

43. If taxi cab drivers were placed in an fMRI and asked to trace the route from location A to location B in their mind, which area in the brain would show the highest activity?

a. Visual cortex

b. Hippocampus

c. Parahippocampal place area

d. Entorhinal cortex

e. Parietal association cortex

*Answer:* c

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 3. Applying

44. Assuming comparable age, lifestyle choices, health, education, etc., who would be the *least* affected Alzheimer’s disease?

a. Taxi cab drivers

b. Electricians

c. Plumbers

d. Fire fighters

e. Construction workers

*Answer:* a

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 3. Applying

45. You enter an unfamiliar park, filled with walking paths, trees, bushes, benches, and an occasional garbage can. You can judge the spatial arrangement among these objects because of your

a. visual cortex.

b. hippocampus.

c. entorhinal cortex.

d. parahippocampal area.

e. medial temporal lobe.

*Answer:* b

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 3. Applying

46. You are lost in an unfamiliar part of town. Which type of framework would be better in helping you to find your way out?

a. Allocentric

b. Egocentric

c. Mostly allocentric and a little bit of egocentric

d. Mostly egocentric and a little bit of allocentric

e. Both allocentric and egocentric, divided evenly

*Answer:* d

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 3. Applying

47. Which structures can you lesion in a rat’s brain and still minimally impact his ability to successfully navigate a maze?

a. Hippocampus place cells

b. Entorhinal cortex grid cells

c. Parahippocampal area cells

d. Visual cortical cells

e. Medial temporal lobe cells

*Answer:* c

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 5. Evaluating

48. To truly isolate the effects of grid cells and place cells in the grid experiment for rats that had to navigate a grid box, the grid box should

a. not include the chocolates as motivators.

b. be devoid of any external visual cues.

c. be of a certain size.

d. be devoid of any auditory distractions.

e. be devoid of any olfactory distractions, except that of the chocolates.

*Answer:* b

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 4. Analyzing

49. Children 6-to-8 years of age are not quite yet fully capable of handling abstract thought. Thus, the best way to train these children in spatial relationships is to

a. show them an animation (film) of variously shaped blocks rotating in space.

b. explain to them what various shapes look like from different angles.

c. show them a movie in which the shapes are animated cartoon characters that move about, changing their orientation.

d. have them read about the various shapes.

e. have them play with blocks of various shapes.

*Answer:* e

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 3. Applying

50. Which field of study probably relies on spatial abilities the most?

a. Architecture

b. Microbiology

c. Organic chemistry

d. Physiology

e. Geology

*Answer:* a

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 3. Applying

**Short Answer**

51. Name the various types of memories used when learning how to play the violin.

*Answer:* Semantic memory as a form of explicit memory: learning the names of the notes and how to read music. Procedural and motor control sequence learning is necessary to learn how to hold the violin and bow to play the notes; posture is also important for this. Priming: Reading music is like reading words, especially if you understand the pattern or style of the music. One note or series of notes can be a prime, hint, or cue to the next note or notes. Statistical learning: music can be a meaningful pattern of sounds (notes); the more musically inclined one is, the better the musician. Contextual cuing: music compositions have patterns, which establish mood and context, and which becomes increasingly more apparent to the musician as she becomes more experienced and sophisticated in playing the violin.

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 3. Applying

52. Event-related potential signal changes in the parietal cortex are associated with recollection, while such changes in the midfrontal sites are associated with familiarity. Anatomically, then, how is the hippocampus, which is important for recollection, involved?

*Answer:* The hippocampus and parietal sites probably send impulses to each other (recollection), while the midfrontal and medial temporal lobe probably sent impulses to each other (familiarity).

*Textbook Reference:* 7.1 Memory Systems

*Learning Objective:* 7.1 Discuss the roles of different types of memory systems, including explicit and implicit memory, in human memory function.

*Bloom’s Level:* 4. Analyzing

53. In the serial position experiment, hypothesize what would happen to the primacy and recency effects if the words presented are all obviously related (e.g., all farm animals) versus non-related words (i.e., random words). Explain why.

*Answer:* If participants were presented with all related words, the primacy effect, signifying long-term memory, would be more pronounced (higher scores on the ordinate, percentage of word being recalled; recency effect (short-term memory) might also be higher than shown in textbook Figure 7.8. If participants were presented with all random words, you would probably get results comparable to that shown in Figure 7.8. It is possible that when presented with related words, each word acts as a prime or a hint to the other words in the set. Note that any relationship might work just as well; words could be conceptually related (e.g., farm animals), phonetically related (e.g., all homonyms) or orthographically related (e.g., all beginning with the letter “H”).

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 5. Evaluating

54. Explain how the brain neocortex stores memories in terms of a distributed code.

*Answer:* Memories will be stored in the pertinent parts of the neocortex, depending on the stimulus-specific modality that was initially encoded. That is, auditory information will be encoded in the auditory and parietal neocortices; visual information will be encoded in the visual and parietal neocortices. Note that the parietal cortex is an associated cortex, which helps makes sense of the information, so that encoding is more meaningful. That is why we tend to remember things and experiences that are more meaningful than everything we see, hear, and experience. Retrieval of such memories will be activated in the form of a code—event-related potentials of varying magnitude and/or frequencies or action potentials of varying frequencies. The strength of these activities will determine the strength of the memory.

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 4. Analyzing

55. Propose an explanation of how/why memories change over time.

*Answer:* The brain is not a static structure; it is dynamic, constantly changing from day-to-day, even hour-to-hour at the cellular level. New experiences (or even lack of experiences) change the neurons’ abilities to communicate with other neurons: neural proteins and chemicals (neurotransmitters) determine the strength of connections between neurons. It is possible that these dynamic changes in connections affect the coding that neurons use to retrieve memories. If the coding is affected, the memories may be slightly altered, depending on the strength of such changes and where in the brain they occur.

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 5. Evaluating

56. If the hippocampus system allows for rapid learning of new items, and the neocortex learns and changes slowly, how is it that long-term potentiation, which occurs primarily in the hippocampus, takes time to develop?

*Answer:* The hippocampus and neocortex send impulses back and forth solidifying the connections. In the neocortex, associations with the initial quickly-formed memories in the hippocampal system are consolidated and strengthened.

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

57. Explain the role of glucocorticoids in stress and why too much is deleterious to learning and memory.

*Answer:* Cortisol is a defense response to stress placed on the body. Stress activates the sympathetic nervous system, making sure that the animal has plenty of fuel (e.g., glucose) for the impending/current threat to survival (“fight-or-flight”). However, too much cortisol severely damages hippocampal neurons, causing them to atrophy and ultimately die. This severely disrupts hippocampal function of learning and memory formation and consolidation, inability to concentrate, focus, and perform under stress.

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 2. Understanding

58. Refer to the graph. Months of combat exposure is inversely correlated with hippocampal volume, with non-PTSD participants having a higher hippocampal volume than those with PTSD.



How would you determine and then display whether these two groups are statistically different in terms of hippocampal volume?

*Answer:* Calculate a Mann-Whitney U (non-parametric version of a *t*-test) and then graph them on a bar graph with means +/- standard deviations. The parametric *t*-test would be inappropriate because the sample size looks to be too small to achieve the homogeneity of variance that such tests assume.

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 6. Creating

59. There is a disconnect between real-life clinical depression and/or stress versus laboratory experiments demonstrating impaired memory and cognitive functions in both humans and other animals. What is this disconnect?

*Answer:* Real-life clinical depression and/or stress occurs over at least days, and most of the time, much longer, whereas lab experiments, especially those done on human participants, are short-term. Even when cortisol is administered to study participants, they performed worse in cognitive and memory and spatial tasks, compared to their placebo cohorts. One must ask whether cortisol is damaging the hippocampus in such a short span of time. Additional studies must be done to determine if it is really cortisol damaging the hippocampus over this extreme short-term period, or if it is something else as well.

*Textbook Reference*: 7.2 Memory Encoding, Storage, and Retrieval

*Learning Objective:* 7.2 Describe how the brain distinguishes long-term versus short-term memory, and how it encodes, stores, and retrieves memories.

*Bloom’s Level:* 4. Analyzing

60. Make the argument that egocentric and allocentric frameworks are actually the same thing, but from different perspectives.

*Answer:* In both frameworks, knowledge and awareness of where other objects are is essential, regardless of whether it is from the point of view of the observer (egocentric) or of the objects in spatial relation with each other (allocentric). In the latter, the point of view is still from that of the observer, but he or she is placing relatively more importance on location of the other objects and how they are arranged with respect to each other.

*Textbook Reference*: 7.3 Spatial Memory

*Learning Objective:* 7.3 Discuss how spatial memory functions and its role in navigation.

*Bloom’s Level:* 4. Analyzing