# CHAPTER 1 FOUNDATIONS

## **MULTIPLE-CHOICE QUESTIONS**

1	Perception	nrimarily	differs	from	sensation	in th	at only	nercention	involves
т.	1 CICCPHOII	primarii	y unitions	11 0111	Schsanon	III UI	iai Omy	perception	IIIVOIVCS

- a. forming mental representations of objects and events.
- b. converting features of the environment into electrochemical signals.
- c. the use of specialized sense organs.
- d. only bottom-up processing.

Ans: A	Level: M	Page: 2	Topic: Foundations	

Page: 3

- 2. Arvi, standing outside, turns his head as he hears the distinctive sound of a Harley-Davidson motorcycle (vroom!-vroom!-vroom!) coming down the street. In this example, the distal stimulus is
  - a. the sound waves reaching his ears.

Level: D

Level: M

- b. the light waves reaching his eyes.
- c. the vibration of the street produced by the motorcycle.
- d. the motorcycle itself.

Ans. D

	111107 2	20,000	- mg*** c	1 op. 1 1 1 0 1 op 1 0 1 0 0 0 0 0
3.				rotation of a pitched ball. More experienced hitten
	plate, but most	rookies cannot	•	experienced hitters can better apply
	a. bottom-up	information.		
	b. top-down i	nformation.		
	c. distal stimu	ıli.		
	d. transductio	n.		
	Ans: B	Level: M	Page: 3	<b>Topic: The Perceptual Process</b>

Tonic: The Percentual Process

**Topic: The Perceptual Process** 

- 4. Cells in the nervous system that convert proximal stimuli into neural signals are called
  - a. dendrites.
  - b. synapses.
  - c. sensory receptors.
  - d. distal receptors.

Ans: A

		I		
	Ans: C	Level: M	Page: 3	<b>Topic: The Perceptual Process</b>
5.	An example of	of a distal stimul	us would be	, while an example of a proximal stimu-
	lus would be	·		
	a. a slammir	ng door; sound w	aves	
b. a pine tree; a slamming door				
	c. sound way	ves; a slamming	door	
	d. a slammir	ng door; a pine tr	ee	

Page: 3

1

6.	_	rson's know ottom-up in		tions, and goals	are referred to as				
		p-down inf							
		•		up information.					
		roximal stin							
	_	ans: B		Page: 3	<b>Topic: The Perceptual Process</b>				
7.				into	neural signals.				
		p-down inf	ormation						
	b. li	_							
		istal stimuli							
	-	roximal stin		Daga. 2	Tourist The Demonstruct Duncons				
	A	ans: D	Level: M	Page: 3	<b>Topic: The Perceptual Process</b>				
8.	A co	gnitive neur	oscientist mea	sures, w	hile a psychophysicist assesses				
			y; cognition						
			•	ridual neural act	*				
			-	vioral responses					
		_	_	s; neural circuit	•				
	A	ans: C	Level: M	Page: 5	<b>Topic: Three Main Types of Questions</b>				
9.	<ul><li>a. pr</li><li>b. no</li><li>c. ol</li><li>d. gr</li></ul>	roprioception. ociception. lfaction. ustation.	on.	r limbs as well a	Topic: How Many Senses Are There?				
	P	MIS. A	Level. E	1 age. 0	Topic. How Many Senses Are There:				
10.		_	s of the visible	_					
			le infrared or u		amitted by the sun				
		<ul><li>b. are the least abundant wavelengths of light emitted by the sun.</li><li>c. are poorly transmitted in water.</li></ul>							
			swers are corre						
		ins: A		Page: 7	Topic: Evolution and perception				
11.	Acco	rding to the	"law of specif	ic nerve energie	es," the reason the brain interprets certain incom-				
	_	_	•	rmation is that the	nese signals				
			of photons ent		1				
					photoreceptors.				
					of fibers that connects the eye to the brain).				
		iemseives co	ontain light end Level: D		of electromagnetic radiation.				
				Page: 7	eurons and the Brain				
		obic. Exhio	ring rereception	i by Studying Ne	and the Diam				

12.	are activated, not on what's activ  a. law of specific nerve energies  b. law of effect  c. neural doctrine  d. law of perceptual processing  Ans: A Level: E	ating those neuro	
	Topic: Exploring Perception b	y Studying Neur	ons and the Brain
13.	The idea that perception depends which responds to specific aspect a. neuron doctrine.  b. law of specific nerve energies c. principle of natural selection. d. law of structural specificity.  Ans: A Level: E  Topic: Exploring Perception by	es of a stimulus d s. Page: 8	
14.	What is the order in which various receives a signal to the time it trata. axon terminals, axon, cell book be cell body, dendrite, axon terminal, dendrited. dendrite, cell body, axon, axon terminal, dendrited. dendrite, cell body, axon, axon terminal, dendrited. Level: M	nsmits a signal in dy, dendrite ninal, axon , cell body	ome involved from the time a neuron first in response?  Topic: Neurons and Neural Signals
15.	<ul><li>b. the concentration of only sodi</li><li>c. the concentration of neurotran</li></ul>	and negatively clium and potassiunsmitters on either	narged ions on either side of the cell membrane. m ions within the cell membrane. er side of the cell membrane. ions on either side of the cell membrane.  Topic: Neurons and Neural Signals
16.	A neuron at rest has a membrane a30 mV. b. +30 mV. c. +70 mV. d70 mV.  Ans: D Level: M	potential of Page: 9	Topic: Neurons and Neural Signals
17.	When an action potential begins, a. closing of voltage-gated chan b. the release of Cl-ions. c. the influx of K+ ions. d. the influx of Na+ ions.  Ans: D Level: M	_	f the axon membrane is the result of  Topic: Neurons and Neural Signals

<ul><li>a. lead</li><li>b. are</li><li>c. allo</li></ul>	d to hyperp found in th ow Na+ ion	polarization when dendrites.  s to exit the ne	en opened. uron.			
An	s: D	Level: D	Page: 10	<b>Topic: Neurons and Neural Signals</b>		
<ul><li>a. dep</li><li>b. is a</li><li>c. req</li><li>d. dep</li></ul>	ends on the low spont uires a very bends on the	e frequency of aneous firing ra y weak stimulu	ate in the absences.	e of stimulation.		
<ul><li>a. the</li><li>b. the</li><li>c. soo</li><li>d. All</li></ul>	probability membrane lium ions h of the ansy	y of an action perpendicular potential has a ave entered the	ootential is increated.  depolarized.  e cell.			
<ul> <li>With a dorsal view of the cerebral hemispheres, you would be able to see</li> <li>a. only the parietal lobes.</li> <li>b. only the frontal and occipital lobes.</li> <li>c. the frontal, parietal, temporal, and occipital lobes.</li> <li>d. only the brain stem.</li> <li>Ans: C Level: M Page: 15 Topic: The Human Brain</li> </ul>						
<ul><li>a. fro</li><li>b. tem</li><li>c. occ</li><li>d. cer</li></ul>	ntal nporal sipital ebellar	s separates the	parietal lobe fro Page: 15	m the lobe.  Topic: The Human Brain		
<ul><li>a. tha</li><li>b. hip</li><li>c. am</li><li>d. cor</li></ul>	lamus pocampus ygdala pus callosu	ım	n the sensory or Page: 16	rgans pass through which subcortical structure?  Topic: The Human Brain		
stand s can no a. a si b. a d c. exp d. par	poken Eng longer und ngle disso ouble disso perience-de ietal-lobe o	lish but can on lerstand spoker ciation. ociation. pendent plastic lamage.	ly speak gibberi n English. This i sity.	sh. The other can still speak English fluently but		
	a. lead b. are c. allo d. allo An Aneura. dep b. is a c. req d. dep An When a a. the b. the c. sod d. All An With a a. onl b. onl c. the d. onl An Aneura. Most ma. than b. hip c. am d. cor An Aneura stand s can no a. a si b. a dec. exp d. par	a. lead to hyperp b. are found in the c. allow Na+ ion d. allow Na+ ion Ans: D  A neuron's baselia a. depends on the b. is a low spont c. requires a very d. depends on the Ans: B  When an excitato a. the probability b. the membrane c. sodium ions he d. All of the ansy Ans: D  With a dorsal viet a. only the pariet b. only the front c. the frontal, pa d. only the brain Ans: C  The central sulcus a. frontal b. temporal c. occipital d. cerebellar Ans: A  Most neural signa a. thalamus b. hippocampus c. amygdala d. corpus callost Ans: A  A neuropsycholog stand spoken Eng can no longer und a. a single dissod b. a double dissod c. experience-de d. parietal-lobe of	a. lead to hyperpolarization whb. are found in the dendrites. c. allow Na+ ions to exit the new d. allow Na+ ions to enter the new d. allow Spontaneous firing rate a. depends on the frequency of b. is a low spontaneous firing rate. c. requires a very weak stimulured. d. depends on the number of dew d. ans: B. Level: D.  When an excitatory postsynaption a. the probability of an action p. b. the membrane potential has one c. sodium ions have entered the d. All of the answers are corrected. Ans: D. Level: M.  With a dorsal view of the cerebration a. only the parietal lobes. b. only the frontal and occipital c. the frontal, parietal, temporal d. only the brain stem.  Ans: C. Level: M.  The central sulcus separates the a. frontal b. temporal c. occipital d. cerebellar  Ans: A. Level: M.  Most neural signals originating in a. thalamus b. hippocampus c. amygdala d. corpus callosum  Ans: A. Level: E.  A neuropsychologist has been st stand spoken English but can on can no longer understand spoken a. a single dissociation. b. a double dissociation. c. experience-dependent plastic d. parietal-lobe damage.	c. allow Na+ ions to exit the neuron. d. allow Na+ ions to enter the neuron. Ans: D Level: D Page: 10  A neuron's baseline firing rate a. depends on the frequency of previous action b. is a low spontaneous firing rate in the absence. requires a very weak stimulus. d. depends on the number of dendrites the cell pans: B Level: D Page: 11  When an excitatory postsynaptic potential occur a. the probability of an action potential is increable the membrane potential has depolarized. c. sodium ions have entered the cell. d. All of the answers are correct. Ans: D Level: M Page: 13  With a dorsal view of the cerebral hemispheres, a. only the parietal lobes. b. only the frontal and occipital lobes. c. the frontal, parietal, temporal, and occipital ld. only the brain stem. Ans: C Level: M Page: 15  The central sulcus separates the parietal lobe froa frontal b. temporal c. occipital d. cerebellar Ans: A Level: M Page: 15  Most neural signals originating in the sensory or a. thalamus b. hippocampus c. amygdala d. corpus callosum Ans: A Level: E Page: 16  A neuropsychologist has been studying two patistand spoken English but can only speak gibberi can no longer understand spoken English. This i a. a single dissociation. c. experience-dependent plasticity. d. parietal-lobe damage.		

- 25. In the field of cognitive neuropsychology, findings based on studies of just a few individuals can be generalized and applied to most human brains based on the
  - a. doctrine of specific nerve energy.
  - b. notion of modularity.
  - c. assumption of cognitive uniformity.
  - d. concept of functional specialization.

Ans: C Level: M Page: 18 **Topic: Cognitive Neuropsychology** 

- 26. Functional magnetic resonance imaging (fMRI) indirectly measures neural activity by measuring
  - a. changes in blood flow.
  - b. changes in metabolic activity.
  - c. the magnetic properties of neurons.
  - d. changes in blood oxygen.

Ans: D Level: M Pages: 19-20 **Topic: Functional Neuroimaging** 

- 27. The minimum intensity of a physical stimulus that can just be detected by an observer is called
  - a. the absolute threshold.
  - b. the difference threshold.
  - c. the just noticeable difference.
  - d. Fechner's law.

Ans: A Level: E Page: 21 **Topic: Psychophysics** 

- 28. Dr. Lazarte is testing an elderly patient's hearing by presenting a set of tones at different intensities. Each tone is presented multiple times, interleaved with the other tones in a random order. After each presentation, the patient indicates whether she heard the tone. The psychophysical technique being used is the
  - a. method of adjustment.
  - b. staircase method.
  - c. method of constant stimuli.
  - d. method of random stimuli.

Ans: C Level: M **Topic: Psychophysics** Page: 22

- 29. The staircase method is a variation on the method of
  - a. limits.
  - b. adjustment.
  - c. constant stimuli.
  - d. minimal perception.

Ans: C Level: E Page: 23 **Topic: Psychophysics** 

- states that "the size of the JND tends to increase as the intensity of the standard stimulus (or background) increases."
  - a. Weber's law
  - b. Weber's fraction
  - c. Fechner's law
  - d. Stevens' law

Ans: A Level: E Page: 26 **Topic: Psychophysics** 

31.	wo a. b. c.	e JND for a 10 uld be 200 g. 2 g. 20 g. undetermined		g. According to V	Veber's law the JND for a 1000 g weight
		Ans: C	Level: M	Page: 26	<b>Topic: Psychophysics</b>
32.	the mg tain app a. b. c.	sweetness of Based on thining 250 mg oblies.) 5 mg 10 mg 12.5 mg 20 mg	sugar in a cake. I s information, ho	For a cake with 1 ow much sugar w	Villie has found the difference threshold for 00 mg of sugar, the difference threshold is 5 rould need to be added to a cake already constant noticeably sweeter. (Assume Weber's law Topic: Psychophysics
33.	Ac	cording to you	ır text. Fechner's	law adds to Wel	per's law the idea that 1 JND
33.	a. b. c.	equals 1 unit equals log 1 u equals 1 unit equals k unit	of perceived inte init of perceived of perceived inte of perceived inte	nsity. intensity. ensity raised to thensity.	e second power.
		Ans: A	Level: D	Page: 27	Topic: Psychophysics
34.	suc a. b. c.	_	, provided find		's law because some perceptual dimensions, consistent with Fechner's law.
		Ans: D	Level: E	Pages: 27-28	<b>Topic: Psychophysics</b>
35.	a. b. c.	cording to sign hit. false alarm. miss. correct reject		ory, saying "yes"	after a signal is presented is considered a
		Ans: A	Level: E	Page: 32	<b>Topic: Signal Detection Theory</b>
36.	nui a. b. c.	mber of misses + corr hits + false al	ect rejections. arms correct rejection		of times a stimulus is presented is equal to the  Topic: Signal Detection Theory
		Alls. D	Level. D	1 age. 32	Topic. Signal Detection Theory

- 37. In a signal detection experiment, the value of d' is a function of
  - a. the observer's sensitivity and the magnitude of the stimulus.
  - b. the observer's decision criterion and the magnitude of the stimulus.
  - c. the observer's sensitivity and decision criterion.
  - d. the observer's sensitivity and decision criterion, and the magnitude of the stimulus.

Ans: A Level: M Page: 36 **Topic: Signal Detection Theory** 

- 38. Bob and Jasmin take part in a signal detection study in which they are presented with identical stimuli. Bob's measure of d' is 2.3 whereas Jasmin's d' is 0. Jasmin could be considered a observer.
  - a. very sensitive.
  - b. moderately sensitive.
  - c. weakly sensitive.
  - d. completely insensitive.

Ans: D Level: M Page: 36 **Topic: Signal Detection Theory** 

- 39. When interpreting medical diagnosis in terms of signal detection theory, which diagnostic result is equivalent to a miss?
  - a. true positive
  - b. false positive
  - c. false negative
  - d. true negative

Ans: C Level: M Page: 39 **Topic: Signal Detection Theory** 

#### **ESSAY QUESTIONS**

- 1. Describe five distal stimuli and their associated proximal stimuli that you are experiencing in your present environment; no two stimuli should be from the same perceptual dimensions. For each of these distal stimuli, describe the top-down processes used in perceiving it.
- 2. Focusing on the role of voltage-gated channels (Na<sup>+</sup> and K<sup>+</sup>), describe the events that occur along the axon in the course of an action potential.
- 3. Describe the activities involving neurotransmitters that occur in response to an action potential, focusing on what happens in the axon terminal of the presynaptic neuron, in the synapse, and in the postsynaptic membrane.
- 4. You and a friend jump into a pool, forgetting you are both still carrying your smart phones. Your smart phone now has no sound but has a picture. Your friend's identical phone has sound but no picture. Is this a single or double dissociation? Discuss whether this pattern implies the existence of sound and picture modules within the phones.
- 5. Describe a neuroimaging study that could be used to investigate the presence of a brain area specialized for the processing of faces. (For this question, you need to think of the appropriate visual stimuli to present to participants.)
- 6. Using examples from three different senses, describe three activities in which you need to detect small differences in the intensity of sensory stimuli. What role does your difference threshold play in each activity?

- 7. Compare the advantages and disadvantages of the method of adjustment, the method of constant stimuli, and the staircase method in determining absolute threshold.
- 8. The perception of sound follows Fechner's law. As the volume dial goes from 1 to 2 on an audio device, how then should the physical intensity of the sound change to be perceived as twice as loud? (Should it be doubled? More than doubled? Less than doubled?) Explain your answer.
- 9. In a signal detection experiment, participants are asked to respond when they detect a very low intensity tone. Fred responds to the tone on 80% of its presentations and Miguel responds to it 50% of the time. How could you determine whether Fred is more sensitive to the tone than is Miguel?

#### **ESSAY QUESTION ANSWERS**

- 1. Answers should first relate sensory experience (visual, auditory, olfactory, etc.) to the physical objects (or, distal stimuli) in the environment, and then show how knowledge and expectations lead to perception of the stimuli.
- 2. Signals from other neurons initiate depolarization, the influx of Na<sup>+</sup> into the axon, near where the axon exits the cell body. Na<sup>+</sup> channels then close, followed by the opening of K<sup>+</sup> channels, resulting in repolarization as K<sup>+</sup> exits the axon. Repolarization continues until hyperpolarization is reached, undershooting the neuron's resting potential. The axon then returns to its resting potential. This sequence of events propagates repeatedly along the length of the neuron.
- 3. Synaptic vesicles in the presynaptic neuron release neurotransmitter molecules into the synapse. Drifting through the synapse, some of these molecules bind to receptor sites in the postsynaptic neuron, causing ion channels to open.
- 4. Individually, both friends show a single dissociation. Their combined pattern of disrepair is an example of a double dissociation, suggesting the existence of separate sound and picture modules. The best answer would explain the logic behind this conclusion (e.g., this pattern could not occur if there was a single shared module.)
- 5. Since a neuroimaging design is requested, answers should involve a comparison of brain activity under two or more different conditions. Examples may include a comparison of activity in response to pictures of faces versus scrambled faces, or human faces versus monkey faces. A region specialized for face-processing will show a greater response to (human) faces than other similar stimuli.
- 6. Appropriate examples might be cooking, in which you need to adjust seasonings based on taste, or detecting the proper functioning of a mechanical device (car, air conditioner) based on the sound it makes. The more sensitive the cook's palate, for example, the finer the correction he can make to a recipe.
- 7. Method of adjustment: fast but least precise. Method of constant stimuli: most time-consuming, but most precise. Staircase method: more precise than method of adjustment, less time-consuming than method of constant stimuli.
- 8. Examination of the graph of physical intensity of stimulus versus perceived intensity of stimulus (Figure 1.16) shows a decelerating curve: doubling perceived intensity requires that the physical intensity of the sound be more than doubled.

9. At first glance, Fred may seem more sensitive, but he may also have a higher percentage of false-positive responses, suggesting a liberal decision-making bias, rather than greater sensitivity. To make a comparison of their levels of sensitivity, one could plot each observer's rate of hits and false positives on an ROC plot; the more sensitive observer would be plotted closer to the upper left of the graph (indicating a higher d'.)

#### RESPONSES TO EXPAND YOUR UNDERSTANDING QUESTIONS

1.1 Examples of possible distal and proximal stimuli during the activity of eating dinner:

Sense	<b>Example of Possible Distal</b> <b>Stimulus While Eating Dinner</b>	<b>Example of Possible Proximal Stimulus While Eating Dinner</b>
Vision	Broccoli on diner's plate	Light reflected from broccoli
Audition	Water poured into a glass	Sound of water entering glass
Tactile perception	Fork held in diner's hand	Pressure of fork held in diner's hand
Proprioception	Fork brought to diner's lips	Feeling of arm position
Nociception	Lobster claw	Pressure of sharp claw into finger
Thermoreception	Wine in glass	Cold of glass on hand and fingers
Balance	Heavy plate carried to table	Gravitational force on plate
Body movement	Reaching for bread on table	Acceleration of arm to bread dish
Olfaction	Bacon on diner's plate	Bacon molecules in diner's nose
Gustation	Broccoli in diner's mouth	Broccoli molecules on diner's tongue

- 1.2 The bottom-up information available to Dave's wife was the sight of water under the bathroom door and flooding the hallway. Her experience provided her with the top-down information that the presence of water meant that there was a significant problem of some kind in the bathroom (hence her scream). Dave's driving experience (that is, his top-down information) led him to believe the car in front of him would maintain a constant speed. His wife's scream likely distracted him from perceiving the bottom-up information of the car in front unexpectedly stopping before him, leading to the crash.
- 1.3 Figure 1.5a versus Figure 1.18a: Both figures represent the rate of action potentials as spikes along a horizontal axis of time. Figure 1.5 shows that the spiking rate increases as the stimulus intensity increases, whereas Figure 1.18a shows that across different trial presentations, the same stimulus tone could evoke a wide range of spiking rates.
  - Figure 1.5b vs. Figure 1.11b: Both figures are S-shaped curves, with the stimulus intensity plotted along the X-axis. They differ in that the neuron firing rate is plotted on the Y-axis on Figure 1.5b, and % "yes" responses is on the Y-axis of Figure 1.11b.
- 1.4 Neuropsychological evidence that pain intensity and pain location are represented in different regions of the brain would be the discovery of patients showing a double dissociation of impairment. That is, one patient who is capable of reporting the intensity of a pain but not its location, and a second patient capable of localizing pain but unable to distinguish different pain intensities.

Neuroimaging evidence could result from a study in which participants endure two levels of pain (low and high) at two separate and distant body locations. A brain region that is processing pain location will vary its activity depending on the location of the pain, but it will be largely unaffected by changes to the intensity of the pain; a brain region that is processing pain intensity will vary its activity depending on pain intensity, but it will be largely unaffected by a change in the location of the pain.

1.5 Measuring the absolute threshold for brightness perception using Figure 1.14. The figure as printed demonstrates how to find a just noticeable difference (JND). Absolute threshold may be also thought of as the just noticeable difference, but it's the JND from a black background. As a result, for each method, the initial background would be black rather than gray.

Method of adjustment: On some trials center square is presented below threshold, and participants increase its intensity until it is visible. On other trials the center square is presented well above threshold, and participants decrease its intensity until it is no longer visible.

Method of constant stimuli: The center square is presented at a range of intensities some of which are above and some below the estimated threshold. Each intensity is presented multiple times. Participants report when they can see the square. The threshold is the intensity reported 50% of the time, as determined by the psychophysical function (graphing stimulus intensity versus proportion of times the intensity was detected).

Staircase method: Starting with the center square well below threshold, its intensity is gradually increased until it is reported as visible by the observer. The intensity is then gradually decreased until it can no longer be seen. Each time observers change their response defines a turnaround stimulus level. This procedure is repeated multiple times, and the average of the turnarounds is the threshold.

- 1.6 Fechner's law effectively describes perceptual dimensions (e.g., light and sound) that produce a decelerating curve when graphing stimulus intensity versus perceived intensity. Under Stevens power law, these types of stimuli have exponents of less than one. However, Fechner's law is not appropriate for perceptual dimensions such as length perception, which produces a linear function, or electric shock, which produces an accelerating function. The exponents of these stimulus types under Stevens' power law are 1 or greater. Thus, if the exponent were less than one for every perceptual dimension, we could disregard Stevens' power law.
- 1.7 The bars in Figure 1.18b constitute the frequency distribution for the number of spikes per trial, recorded from a neuron when a hypothetical stimulus of intensity of 3 is presented multiple times; the blue line is a smoothed normal function fitted over the bars. The (non-red) curves in Figure 1.19 represent the identical information as the curve in 1.18b for stimulus intensities 3, 5, 7, and 9.
- 1.8 The X-rayed luggage problem is similar to the "cracks in aircraft wings" problem posed at the end of the chapter. There will be far more items that resemble weapons than actual weapons; however, the cost of missing an actual weapon is potentially devastating. Using signal detection theory, the solution comes down to maximizing utility: maximizing the payoff of correct decisions (hits and correct rejections) and minimizing the cost of errors (misses and false alarms).

If inspectors open every suitcase containing any item barely resembling a weapon, they will catch virtually all weapons ("hits"), but it would be highly impractical: flights could be delayed for hours as many suitcases are opened unnecessarily ("false alarms"). On the other hand, if suitcases are opened only when there is a virtual certainty of a weapon being present (increasing the "correct rejections"), many weapons will go undetected ("misses"). Ultimately, a decision-making criterion must be settled upon that balances the inconvenience of opening suitcases with the small probability of finding a highly dangerous weapon.

#### WEB QUIZZES

1	The	nrocess	$\alpha f$	transduction	occurs	in
1.	1110	process	$\mathbf{o}_{\mathbf{I}}$	uansuuchon	occurs	111

- a. the brain.
- b. all neurons.
- c. specialized neurons.
- d. the central nervous system.

Level: M Ans: C Page: 4 **Topic: Three Main Types of Questions** 

- 2. The receptors that transduce gravitational force are found in the
  - a. mouth.
  - b. skin.
  - c. eyes.
  - d. inner ear.

Ans: D Level: M Page: 6 **Topic: How Many Senses Are There?** 

- 3. The typical neuron has
  - a. one dendrite.
  - b. one axon.
  - c. multiple axons.
  - d. multiple somas.

Ans: B Level: M Page: 8 **Topic: Neurons and Neural Signals** 

- 4. In a single-cell recording,
  - a. one electrode is placed inside the cell membrane and one electrode is placed outside the cell membrane.
  - b. one electrode is placed inside the soma and one electrode is placed inside the axon.
  - c. two electrodes are placed inside the cell membrane at different locations.
  - d. one electrode is placed on the surface of the scalp and one electrode is placed on the earlobe.

Ans: A Level: M Page: 9 **Topic: Neurons and Neural Signals** 

- 5. During the action potential, the membrane potential reaches a peak of
  - a. -30 mV.
  - b. +30 mV.
  - c. +70 mV.
  - d. -70 mV.

Ans: B Level: M **Topic: Neurons and Neural Signals** Page: 10

- The voltage-gated potassium ions channels
  - a. lead to depolarization when opened.
  - b. are found in the dendrites.
  - c. allow K+ ions to exit the neuron.
  - d. allow K<sup>+</sup> ions to enter the neuron.

Ans: C Level: D Page: 11 **Topic: Neurons and Neural Signals** 

7.		igand-gated i sodium ion.	on channel o <sub>l</sub>	pens in response to a	
	b.	voltage chan	ge.		
	c.	synaptic vesi	icle.		
	d.	neurotransm	itter.		
		Ans: D	Level: D	Pages: 12–13	<b>Topic: Neurons and Neural Signals</b>
8.	Pos	itron emissic	on tomograph	y (PET) indirectly n	neasures neural activity by measuring
		changes in b		•	, ,
	b.	changes in m	netabolic activ	vity.	
		_	properties of	f neurons.	
	d.	-	lood oxygen.		
		Ans: A	Level: M	Page: 19	<b>Topic: Functional Neuroimaging</b>
9.	The	e method of _		is considered a mor	e reliable method for estimating absolute
		eshold.			
		limits			
		adjustment			
		constant stin			
	d.	minimal pero	•	D 22	Tanda Danah saharda
		Ans: C	Level: E	Page: 22	Topic: Psychophysics
10.	_		al researcher	who was in a hurry	and not overly concerned with accuracy would
	_	bably use	0.11		
			of adjustment.		
			of constant sti	mulı.	
		the method of the Lamaze 1			
	u.	Ans: A		Dagas: 21 22	Topic: Psychophysics
		Alls: A	Level: E	Fages: 21–22	Topic: Psychophysics
11.				nat relates a measure	e of perceptual experience to the intensity of a
	1 2	sical stimulu			
		The staircase			
			hological fun	ction	
		A psychome		(DOC)	
	d.			aracteristic (ROC) c	
		Ans: C	Level: M	Page: 23	Topic: Psychophysics
12.		is a	way to sepai	rate perceptual sensi	tivity from decision-making style.
		Weber's law			
		Stevens' law			
		Fechner's la			
	d.	Signal detect	•		
		Ans: D	Level: E	Page: 32	<b>Topic: Signal Detection Theory</b>

13.	In	a signal dete	ection experime	nt, an ROC curv	e is a graph of
	a.	hits versus	misses.		
	b.	hits versus	correct rejection	ns.	
	c.	hits versus	false alarms.		
	d.	correct reje	ctions versus fa	lse alarms.	
			Level: M		<b>Topic: Signal Detection Theory</b>
14.	Th	e probability	of hits plus the	e probability of n	nisses in a signal detection experiment would
	a.	equal 1.0.	•		
	b.	equal 0.5.			
		equal 1.5.			
	d.	be undetern	nined.		
		Ans: A	Level: M	Page: 33	<b>Topic: Signal Detection Theory</b>
15.	Fo	r any stimul	us intensity clea	arly above thresh	old, an observer for whom $d$ is zero would be
	co	nsidered a _		_ observer.	
	a.	very sensiti	ve		
	b.	moderately	sensitive		
	c.	weakly sen	sitive		
		completely			
		Ans: D	Level: M	Page: 36	<b>Topic: Signal Detection Theory</b>