

#3 NEUROTRANSMITTER OR HORMONE?

Chemical Name	Classification	Function
GABA	Neurotransmitter	Lowers brain activity; visual processing
Thyroxin	Hormone	Regulation of metabolic processes
Follicle stimulating hormone (FSH)	Hormone	Production of sex cells
Dopamine	Neurotransmitter	Sensory and motor function
Endorphin	Neurotransmitter	Inhibit pain, promote good feelings
Oxytocin	Hormone	Muscle contractions—labor, milk let-down
Serotonin	Neurotransmitter	Mood and sleep regulation
Melatonin	Hormone	Sleep regulation
Insulin	Hormone	Appetite and digestion
Substance P	Neurotransmitter	Transmits sensations of pain
Acetylcholine	Neurotransmitter	Muscle function
Epinephrine/adrenaline	Neurotransmitter/hormone	Memory enhancement/fight-or-flight actions

#4 BRAIN ANATOMY

Structure	Location	Function
Amygdala	Forebrain/limbic system	Enhances memory for emotional stimuli; generates aggressive impulses
Pons	Hindbrain/brain stem	"Bridge" from cerebral cortex to hindbrain
Red nucleus	Midbrain/brain stem	Integration of voluntary motor activities
Occipital lobes	Forebrain/cerebral cortex	Location of the primary visual cortex
Reticular formation	Hindbrain/brain stem	Regulates brain arousal for different states of consciousness
Hippocampus	Forebrain/limbic system	Formation and storage of new memories
Cerebellum	Hindbrain/brain stem	Integration of sensory inputs and motor outputs
Frontal lobes	Forebrain/cerebral cortex	Planning and executing voluntary movement
Thalamus	Forebrain/limbic or cerebral	Integrating and routing sense inputs to the brain
Medulla	Hindbrain/brain stem	Regulation of vital life functions
Temporal lobes	Forebrain/cerebral cortex	Location of primary auditory cortex
Basal ganglia	Forebrain/limbic system	Planning and producing movement

* Sensation + Perception

Chapter 4

PART A. Completion

- Kinesthetic/proprioception
- Smell (taste); taste (smell)
- Transduction
- threshold
- subliminal
- sensory adaptation

7. Perception
8. Vision (seeing)
9. cornea
10. lens
11. vitreous humor
12. Retina
13. rods
14. Photopigments
15. horizontal cells; amacrine cells
16. visual cortex
17. feature detectors
18. retinex or integrated
19. frequency
20. Pinna
21. ossicles; bone conduction
22. inner ear

23. place coding/place principle
24. olfactory
25. limbic system
26. Fungiform papilla
27. Meissner or Pacinian
28. hands
29. Substance P
30. semicircular
31. Muscle spindles
32. perceptual set
33. shape
34. Figure-(fore)ground
35. induced motion
36. binocular
37. Müller-Lyer illusion

PART B. Multiple Choice

- | | | | |
|------|-------|-------|-------|
| 1. a | 9. b | 17. a | 24. c |
| 2. c | 10. c | 18. b | 25. a |
| 3. a | 11. b | 19. b | 26. d |
| 4. b | 12. d | 20. c | 27. d |
| 5. d | 13. c | 21. d | 28. a |
| 6. c | 14. b | 22. b | 29. c |
| 7. b | 15. a | 23. d | 30. a |
| 8. d | 16. c | | |

PART C. Modified True-False

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|----------------------------------|--|
| 1. F; Taste and smell | 13. F; The basilar membrane and the organ of Corti |
| 2. T | 14. F; The temporal lobes |
| 3. F; just-noticeable difference | 15. T |
| 4. F; Sensation | 16. F; the frontal lobes |
| 5. F; Aqueous humor | 17. T |
| 6. T | 18. F; compared to smell, taste |
| 7. T | 19. T |
| 8. F; Rods outnumber cones | 20. T |
| 9. T | 21. T |
| 10. T | 22. T |
| 11. T | 23. F; Endorphin |
| 12. T | |

400 Answers to Practice Exercises

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|--|-----------------------|
| 24. T | 30. T |
| 25. T | 31. F; shape |
| 26. F; visual and balance systems | 32. T |
| 27. T | 33. F; induced motion |
| 28. F; Muscle spindles/joint receptors and Golgi tendon organs | 34. F; binocular |
| 29. T | 35. T |

PART D. Chart Completions

#1 THE EIGHT SENSES

Sense	Physical Stimulus/Stimuli	Receptor(s)
Vision	Light waves	Rods and cones
Hearing	Sound waves (compression and expansion of the air)	Cochlea: basilar membrane, organ of Corti, and hair cells contained within
Smell	Chemical molecules	Olfactory receptors
Taste	Chemical molecules	Fungiform papillae (taste buds)
Touch	Hair displacement, pressure, vibrations	Many types: hair follicle endings, disks, corpuscles, etc.
Pain	Tissue damage	Free nerve endings
Balance	Position and speed of head	Hair cells and otolith organs
Kinesthetic	Motion of and weight on the limbs	Proprioceptors; mechanoreceptors

#2 THE VISUAL SYSTEM

Structure	Location	Function
Cornea	Outer layer of eyeball	Protects eye and gathers light waves
Pupil	Under aqueous humor and cornea	Controls level of light and improves visual acuity
Iris	Surrounding the pupil	Muscles that causes pupil to dilate and constrict
Lens	Focuses light on the retina	Changes for distance and close-up vision
Retina	Back of the eyeballs	Transduction of light stimuli into action potentials
Optic nerve (axons of ganglion cells)	Exits eyeball at the blind spot	Routing of visual information to the brain
Lateral geniculate nucleus	Part of thalamus	Initial processing of visual information
Occipital lobe	Back of cerebral cortex	Primary sight for processing of visual information
Temporal lobes	Sides of cerebral cortex	Further complex visual processing

#3 THE AUDITORY SYSTEM

Structure	Location	Function
Pinna	Outside of head	Gathers sound waves
Tympanic membrane	Middle ear	Contains the ossicles that vibrate in response to sound waves
Cochlea	Inner ear	Transduce sound information
Hair cells	Inner ear	Transduce sound information
Auditory cortex	Temporal lobes	Processing of sound information

#4 THE CHEMICAL SENSES

Structure(s)	Location	Function
Olfactory epithelium	Inside of nasal cavity	Contains olfactory receptors
Olfactory bulb	Right below the frontal cortex	Processing of smell information
Tongue	Mouth	Location of fungiform papillae (taste buds)
Fungiform papillae	On the surface of the tongue, in the cheeks, and in roof of the mouth	Transduction of taste information
Thalamus	Top of brain stem, under cerebral cortex	Begins processing and integration of taste information
Limbic system and cerebral cortex	Brain	Processing of smell and taste information

#5 THE BODY SENSES

Structure(s)	Location	Function
Skin	Covers entire body	Contains various types of cutaneous receptors
Primary somatosensory cortex	Parietal lobe	Touch and pain map of skin surface and body
Free nerve endings	In skin and other body tissues	Transduce information related to pain and other unpleasant sensations
Substance P	Nervous system	Transmission of pain signals
Semicircular canals	Inner ear	Transduction of balance information
Inner ear	Contain otoliths and semicircular canals	Transduction of balance information
Cerebellum	Brain stem	Integration of multiple sensory inputs related to balance and kinesthetic channels
Proprioceptors or mechanoreceptors	Joints, muscles, and tendons	Transduction of information about weight and strain on limbs, joints, and muscles