STUDY GUIDE 9

1. Sensations

a. Match the structures with the statements that follow.

1) Cerebral cortex 2) Nerve fiber 3) Receptor

__2__ Carries impulses.
__3__ Forms sensory impulses.
__1__ Interprets impulses as sensations.
__3__ Decreases impulse formation when repeatedly stimulated.
__1__ Projects sensation back to region where impulses seem to originate.
__3__ Sensitive to a particular type of stimulus.
__3__ Exhibits adaptation.

b. Define adaptation. **The decrease in impulse formation when a receptor is repeatedly stimulated by the same stimulus.**

2. General Senses

a. Match the responses with the statements that follow.

1) Cold receptors
2) Free nerve endings
3) Heat receptors
4) Meissner's corpuscles
5) Pressure receptors

__2__ Pain receptors.
__2, 4__ Touch receptors.
__3__ Most sensitive to temperatures over 25°C.
__1__ Most sensitive to temperatures under 10°C.
__2__ May be located in epidermis.
__2, 5__ Located in visceral organs.
__2, 4__ Located in superficial portion of dermis.
__5__ Located in dermis and joints.
__1__ Temperature receptors closest to epidermis.
__4__ Touch receptor abundant in hairless skin.
__1, 3, 4__ Only in the skin.

b. What is referred pain? **Projection of a pain sensation to a body part that is not involved in the source of the stimulus.**

3. Taste and Smell

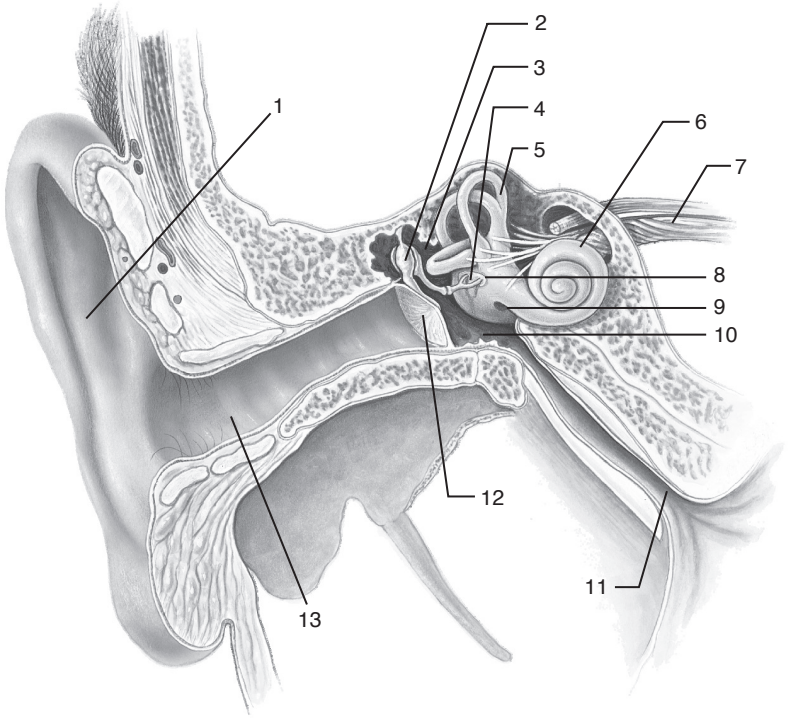
Write the terms described by the statements in the spaces at the right.

1) Organs containing taste receptors. **Taste buds**
2) Receptors located in nasal epithelium. **Olfactory**
3) Type of taste receptors at back of tongue. **Bitter**
4) Type of taste receptors at sides and tip of tongue. **Salt**
5) Type of taste receptors at tip of tongue only. **Sweet**
6) Type of taste receptors at sides of tongue only. **Sour**

4. Ear Structure

a. Label the figure by placing the number of the structure in the space by the correct label.

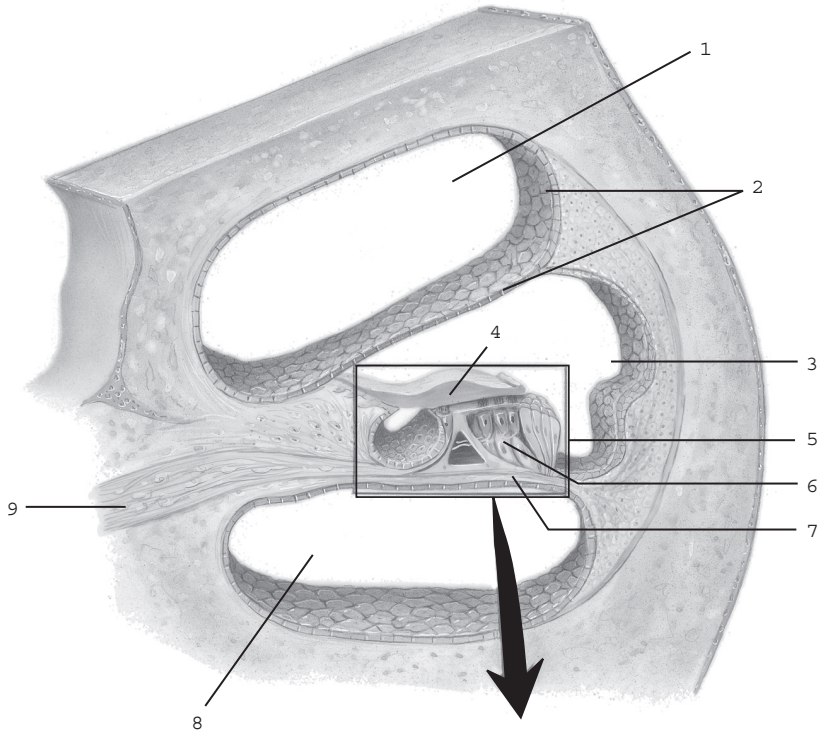
11 Auditory tube	**2** Malleus	**4** Stapes
1 Auricle	**8** Oval window	**10** Tympanic cavity
6 Cochlea	**9** Round window	**12** Tympanic membrane
13 External auditory canal	**5** Semicircular canals	**7** Vestibulocochlear nerve
3 Incus		



b. Write the terms that match the statements in the spaces at the right.

1) Part of the bony labyrinth that contains receptors for
   a) hearing; **Cochlea**
   b) static balance; **Utricle, saccule**
   c) dynamic balance. **Semicircular canals**
2) Fills membranous labyrinth. **Endolymph**
3) Fills bony labyrinth. **Perilymph**
4) Fills tympanic cavity. **Air**

c. Label the figure by placing the number of the structure in the space by the correct label.



__7__ Basilar membrane
__3__ Cochlear duct
__9__ Cochlear portion of the vestibulocochlear nerve
__6__ Hair cells
__5__ Organ of Corti
__8__ Scala tympani
__1__ Scala vestibuli
__4__ Tectorial membrane
__2__ Vestibular membrane

5. Hearing

a. Write the terms that match the statements in the spaces at the right.

1)	Receptor organ for hearing.	**Organ of Corti**
2)	Receptor cells for hearing.	**Hair cells**
3)	Carry vibrations from eardrum to perilymph.	**Ear ossicles**
4)	Directs sound waves to tympanic membrane.	**External auditory canal**
5)	Contains fibers of increasing length.	**Basilar membrane**
6)	Membrane-covered opening into scala tympani.	**Round window**
7)	Membrane struck by sound waves.	**Tympanic membrane**
8)	Membrane that determines pitch of sound.	**Basilar membrane**
9)	Membrane contacting hairs of receptor cells.	**Tectorial membrane**
10)	Allows air to enter tympanic cavity.	**Auditory tube**

b. Write the terms that complete the sentences in the spaces at the right.

Sound waves enter the ____1___ and strike the ____2___ , causing it to vibrate. This vibration is transmitted by the ____3___ to the ____4___ that fills the scala vestibuli and scala tympani. Oscillating movements of this fluid cause comparable vibrations of portions of the ____5___ membrane and the ____6___ that rests upon it. This causes the hair cells to contact the ____7___ , which stimulates them to form ____8___ that are carried to the brain by the ____9___ nerve. The hearing centers in the ____10___ lobes interpret these impulses as sound sensations.

1) **External auditory canal**
2) **Tympanic membrane**
3) **Ear ossicles**
4) **Perilymph**
5) **Basilar**
6) **Organ of Corti**
7) **Tectorial membrane**
8) **Impulses**
9) **Vestibulocochlear**
10) **Temporal**

6. Equilibrium

Write the terms that match the statements in the spaces at the right.

1) Receptor organ for static equilibrium. **Macula**
2) Chambers containing receptors for static equilibrium. **Utricle, saccule**
3) Force stimulating hair cells of macula. **Gravity**
4) Receptor organ for dynamic equilibrium. **Crista ampullaris**
5) Locations of receptor organs for dynamic equilibrium. **Semicircular canals**
6) Fluid moving cupula when head is turned. **Endolymph**
7) Part of brain controlling equilibrium. **Cerebellum**

7. Accessory Structures of the Eye

Write the terms that match the statements in the spaces at the right.

1) Lines eyelids and covers anterior sclera. **Conjunctiva**
2) Group of muscles that move the eye. **Extrensic eye muscles**
3) Secretes tears. **Lacrimal gland**
4) Collect tears at inner corner of eye. **Canaliculi**
5) Carries collected tears into nasal cavity. **Nasolacrimal duct**

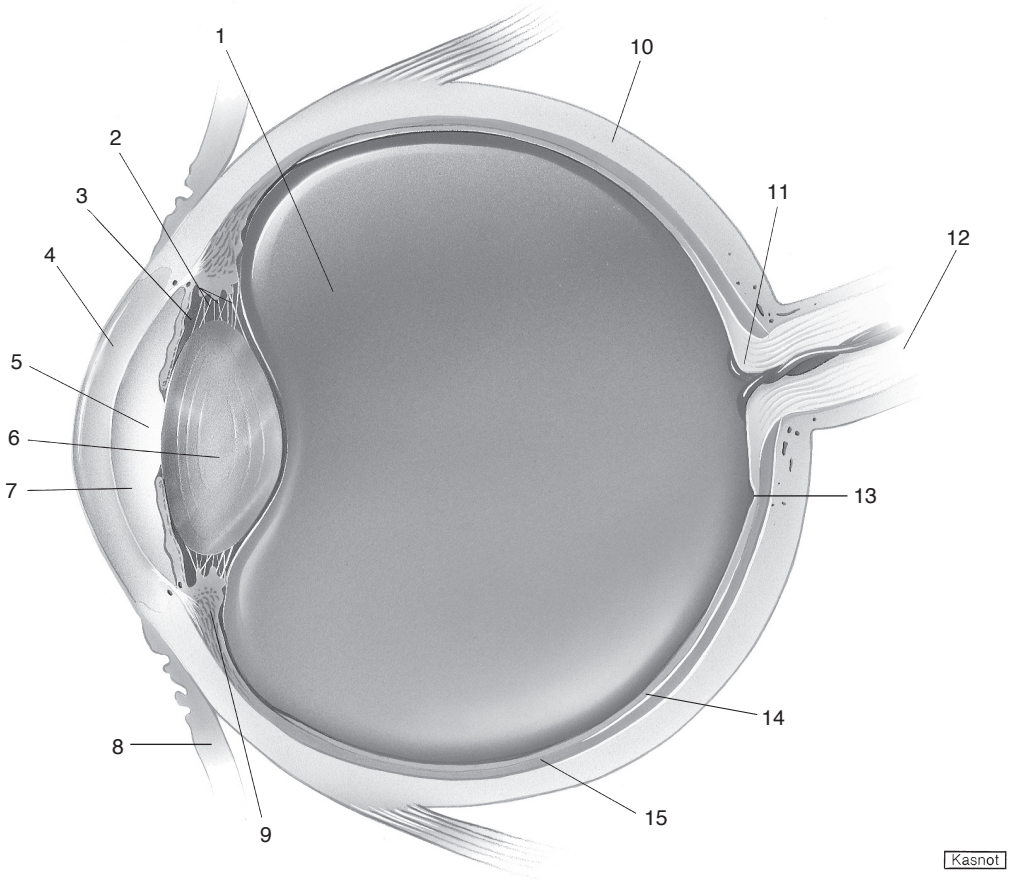
8. Eye Structure

a. Write the terms that match the statements in the spaces at the right.

1) Fills anterior cavity. **Aqueous humor**
2) Pigmented layer of the eyeball. **Choroid**
3) Substance holding retina against choroid. **Vitreous humor**
4) Opening in center of iris. **Pupil**
5) Fluid mostly responsible for internal pressure in eye. **Aqueous humor**
6) Protective outer fibrous coat of eye. **Sclera**

b. Label the figure by placing the number of the structure in the space by the correct label.

7 Aqueous humor in anterior cavity	**11** Optic disk
15 Choroid coat	**12** Optic nerve
9 Ciliary body	**5** Pupil
8 Conjunctiva	**14** Retina
4 Cornea	**10** Sclera
13 Fovea centralis	**2** Suspensory ligaments
3 Iris	**1** Vitreous humor in posterior cavity
6 Lens	



9. Vision

Write the terms that match the statements in the spaces at the right.

1) Contains photoreceptors.	**Retina**
2) Site of direct vision.	**Fovea centralis**
3) Clear window through which light enters eye.	**Cornea**
4) Controls amount of light entering eye.	**Iris**
5) Focuses light rays on retina.	**Cornea and lens**
6) Layer containing blood vessels.	**Choroid**
7) Changes shape of the lens.	**Ciliary body**
8) Retinal area lacking photoreceptors.	**Optic disk**
9) Causes greatest bending of light rays.	**Cornea**

10) Absorbs excessive light in eye. **Choroid**
11) Receptors for dim light vision. **Rods**
12) Receptors for color vision. **Cones**
13) Receptors absent in fovea. **Rods**
14) Carries impulses from retina to brain. **Optic nerve**
15) Where medial nerve fibers cross over. **Optic chiasma**
16) Light-sensitive pigment in rods. **Rhodopsin**
17) Colors of light absorbed by three types of cones. **Red**, **Green**, **Blue**
18) Vitamin required for rhodopsin synthesis. **Vitamin A**

10. Disorders of Hearing and Vision

Write the disorders described in the spaces at the right.

1) An infection called "pink eye." **Conjunctivitis**
2) Cloudiness of the lens. **Cataract**
3) Acute infection of the middle ear. **Otitis media**
4) Deafness due to exposure to loud noises. **Nerve deafness**
5) Deafness correctible by hearing aids. **Conduction deafness**
6) Results from unequal curvatures of lens or cornea. **Astigmatism**
7) Corrected by convex lenses. **Farsightedness**
8) Corrected by concave lenses. **Nearsightedness**
9) Decreased elasticity of the lens. **Presbyopia**
10) Nausea due to repeated stimulation of equilibrium receptors. **Motion sickness**
11) Group of disorders producing nausea, dizziness, and tinnitis. **Labyrinthine disease**
12) Cancer of immature retinal cells. **Retinoblastoma**
13) Caused by excessive intraocular pressure. **Glaucoma**
14) Crossed eyes. **Strabismus**

11. Clinical Applications

a. An older patient calls the office and complains of pain at the base of the neck, left shoulder, and left arm. What is the probable cause of the pain? **Heart attack** Why was the pain localized in these areas? **Sensory impulsed from the heart use nerve serving neck, shoulder, and arm.**

What would you advise the patient to do? **Call 911 or go to the emergency room.**

b. An audiometry test verifies that a college student has a decreased sense of hearing. Discussion brings out that he has been working as an audio engineer at a local disco for three years. What relationship probably exists between his job and his hearing loss? **The loud music has probably caused partial nerve deafness.**