

## Study Guide Chapter 16 (2-7-2025)

### Special Senses

#### 16-1 Intro

- 1 What is a transducer? What does a transducer do? What is “subjective awareness”?
- 2 What part of the neuron is the receptor? What type of potential is created by a stimulus?
- 3 What is the difference between a general sense and a special sense? Locations?
- 4 What is the difference between phasic and tonic receptors? Why do we need both? Give examples? Proprioceptors are?
- 5 What is a nociceptor? What are stimuli for these receptors?

#### 6 What is a 16-2 Vision

- 7 What is the mucous membrane that covers most of the anterior surface of the eye? What is not covered by this membrane? Why? What occurs if this membrane becomes infected? Infection called?
- 8 What gland produces a fluid to cleanse the anterior surface of the eye? What animal only produces excess secretion due to emotional stress?
- 9 What are the three layers of the eye? Function of each? What structure develops at the forward edge of the choroid layer? What three structures extend from here? Significance of each?
- 10 What are the two chambers anterior to the lens? Explain how the fluid moves between these two chambers? What type of molecule fills the space behind the lens?
- 11 What is the significance of the optic disc? What is the common name for this structure? Why?
- 12 Where area has the greatest resolution on the surface of the retina? What is the region called? What is the middle of this spot called? What photoreceptor is concentrated there? What type of light intensity is required there to generate an action potential? What else can you see over the surface of the retina?
- 13 What type of muscle is the iris? How are the fascicles of the iris arranged? Why? What are these fascicles called? What type of reflex may you test with a flashlight in your bathroom? Do it!
- 14 What is emmetropia? Why is this appropriate from the perspective of evolution?
- 15 What is near vision? What three mechanisms allow you to read a book? What is the role of the ciliary muscle? How does the lens change when the ciliary muscle contracts? Significance?
- 16 In order for the image to be in focus the light's focal plane must meet on the surface of the retina. The shape of the lens determines if the focal plane is on the retina. However, if the lens is OK but the shape of the eyeball is not correct, then the focal plane will not fall on the retina and the image will be out of shape. What is the problem with the shape of the eyeball if a person is farsighted? What is the problem with the shape of the eyeball if the person is nearsighted? What are the correct terms to use for farsighted and nearsighted?

- 17 What occurs as the lens ages and becomes cloudy? Condition called? May this be corrected? How?
  - 18 What is glaucoma? Cause? Danger?
  - 19 What are photoreceptors? Which photoreceptor requires more photons to generate an action potential? How are the two photoreceptors concentrated across the retina? What happens to color vision during the transition from daylight to dusk to night?
  - 20 What is rhodopsin? Common name? What photoreceptor uses rhodopsin? What are the two components of rhodopsin? What is the difference between cis and trans retinal?
- 16-3
- 21 What is sound?
  - 22 What are the three sections of the ear? Describe each section.
  - 23 What is the auditory tube? What does it connect? Why do young children have a higher incidence of middle ear infections?
  - 24 What are the two functions of the inner ear? What structures are responsible for these functions? Where are these structures located (within what bone)?
  - 25 What is the structure of the cochlea? (draw and label picture) Where is the location of the oval and round windows? Functions? What is in these chambers?
  - 26 What is the organ of Corti? Function? Location?
  - 27 What is the difference between pitch and loudness? At what point may loudness cause damage to the ear?
  - 28 What type of gate creates the action potential for hearing?
  - 29 What are the two types of hearing loss? What famous composer has a hearing loss? Type?
  - 30 What two nerves in the inner ear are responsible for hearing and equilibrium? What cranial nerve is formed when these two nerves merge?
  - 31 What is the function of equilibrium? What is another term used to describe this function? What are the receptors for equilibrium? What type of equilibrium is measured by each receptor?
  - 32 What is the difference between static and dynamic equilibrium? What are the two forms of dynamic equilibrium?
  - 33 Starting to move in an elevator or in a car are examples of dynamic linear equilibrium. What receptor creates the action potential for each form of dynamic linear equilibrium? Where are these receptors located?

- 34 What receptor senses dynamic rotational equilibrium? Why are three semicircular ducts needed?
- 35 What is the relationship between the semicircular ducts and the ampulla? Structure and function? Significance?
- 36 How do the special senses work together?