

Sensation and Perception

- Most refraction of light entering the eye takes place at the boundary between the
 - air and cornea
 - cornea and aqueous humor
 - aqueous humor and lens
 - lens and vitreous humor
- All sensory impulses on the way to the cortex pass through the thalamus except impulses from sensory receptors involved in
 - vision
 - hearing
 - olfaction
 - proprioception
- A weight-lifter performing a squat exercise experiences a sudden relaxation of a thigh muscle (rectus femoris) to prevent tearing. The efferent impulses governing the response originate from which CNS structure?
 - cerebellum
 - precentral gyrus
 - medulla
 - spinal cord
- A cereal manufacturer conducts a marketing study and discovers that the smallest reduction in weight that a customer barely perceives in the same box is reduction from 12 oz. to 11.4 oz. What is the smallest amount which the customer could notice removed from the 24 oz. box?
 - 0.60 oz
 - 0.83 oz
 - 1.20 oz
 - 2.40 oz
- The sound of a politician's voice is emanating from a public address system on the side of the lectern, but an audience member perceives the sound coming from the speaker. This is an example of
 - visual capture
 - perceptual constancy
 - the binding problem
 - selective attention
- We perceive the panda figure below as being whole even though it is not complete.

This is an example of the perceptual principle of

 - bottom-up processing
 - figure-ground
 - closure
 - similarity
- For the figure below:

THE CAT

Reading 'THE CAT' despite the ambiguous lettering is an example of

 - good continuation
 - top-down processing
 - change blindness
 - phi phenomenon

8. Turning a coin in your hand while examining it visually edgewise, the proximal stimulus changes but the object maintains perceptual identification as a coin. This illustrates
- A. good continuation
 - B. perceptual constancy
 - C. the principle of Prägnanz
 - D. feature detection
9. A municipal transit authority performed a study to determine whether a chime announcing the impending arrival of a train would be detected by travelers within a noisy subway station. The expert categorized those cases in which the subject correctly noted that the chime was absent as
- A. misses
 - B. hits
 - C. correct rejections
 - D. false alarms
10. If you stare at a red triangle on a page and then turn away to a blank piece of paper, you will see an image of a green triangle on the page. This is best explained by which of the following theories?
- A. Young-Helmholtz theory
 - B. trichromatic theory
 - C. place theory
 - D. opponent process theory
11. In the processing of visual information, an integrated image of an object is not formed until the information is processed by the
- A. occipital lobe
 - B. somatosensory cortex
 - C. lateral geniculate nucleus
 - D. superior colliculus
12. Which of the following best explains why particular smells may be powerful triggers for memory recall?
- A. Thalamic input from olfaction routes through the hippocampus.
 - B. The olfactory bulb is one of the few structures undergoing continuing neurogenesis in adults.
 - C. The connectivity of vomeronasal sensor-glomery neurons to mitral cells is precise.
 - D. The olfactory bulb is part of the limbic system.
13. Which of the following best explains how individuals with red-green color blindness can still see yellow?
- A. trichromatic theory
 - B. opponent process theory
 - C. signal detection theory
 - D. synesthesia
14. The Barany chair is a device used for aerospace physiology training. The subject is placed in the chair, blindfolded, then spun about the vertical axis while keeping his head upright or tilted forward or to the side. The subject is then asked to perform tasks such as attempting to point at a stationary object without blindfold after the chair is stopped. The chair is used to demonstrate effects which may occur in flight maneuvers on
- A. CSF pressure
 - B. cerebellar peduncles
 - C. the vestibular system
 - D. the lateral geniculate nucleus

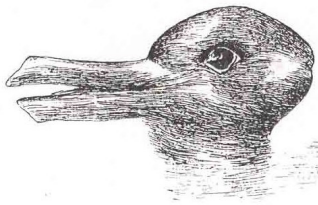
15. A synonym for the physiological blind spot located on the retina of the eye is the
- optic disc
 - fovea centralis
 - macula lutea
 - sclera
16. In beta movement, an object is perceived as moving when, in fact, a series of stationary images is being presented. At faster alternation rates, and if the distance between the stimuli is just right, an illusory “object” the same colour as the background is seen moving between the two stimuli and alternately occluding them. This is called
- synesthesia
 - the phi phenomenon
 - good continuation
 - Prägnanz
17. Which structure marks the boundary between the middle and inner ear?
- tympanic membrane
 - cochlea
 - oval window
 - malleus
18. A subject was found 50% of the time to correctly detect an 800 Hz tone with a RMS sound pressure of 20 μ Pa. For this study participant, this particular level of stimulus
- represents the absolute threshold of hearing for a tone of that frequency
 - is below the minimum threshold of hearing for a tone of that frequency
 - represents the difference threshold of hearing for a tone of that frequency
 - is above the minimum threshold of hearing for a tone of that frequency
19. A person relaxing on their hammock experiences the sound of a leaf blower in a neighboring yard with a loudness of 85dB. When another landscaper joins to work alongside the first, the new loudness experienced will be approximately
- 88dB
 - 90dB
 - 95dB
 - 99dB
20. Given that neurons possess a maximum firing rate of approximately 500 Hz, which of the following provides the best explanation for the human ability to perceive sonic frequencies in the 500 Hz to 1000 Hz range?
- place theory
 - frequency theory
 - volley theory
 - signal detection theory
21. Proprioceptors are not located in the
- striated muscle
 - tendons
 - joints
 - inner ear
22. Which of the following are a type of proprioceptor?
- Muscle spindles
 - Golgi tendon organs
 - Pacinian corpuscles
 - Ruffini corpuscles
- I and II
 - III and IV
 - I, II, and III
 - I, II, III and IV

23. Which of the following stimuli is most likely to trigger activation of nociceptors in the skin?
- A. application of a warm compress
 - B. a light touch with a feather
 - C. an incision breaking the skin
 - D. vibration of a cellular phone
24. Sensory receptors comprised of free nerve endings responding to stimulus with an increase or decrease in firing rate best describes which of the following?
- A. thermoreceptors
 - B. hair cells
 - C. hair follicle receptors
 - D. nociceptors
25. Which sensory receptors hyperpolarize to initiate signal transduction in response to a stimulus rather than depolarize?
- A. nociceptors
 - B. rods and cones
 - C. Pacinian corpuscles
 - D. Merkel cells
26. Which of the following reflects the correct order of signal amplification and transduction in the retina?
- A. rhodopsin, transducin, phosphodiesterase, cGMP, 5' GMP
 - B. transducin, rhodopsin, phosphodiesterase, 5' GMP, cGMP
 - C. rhodopsin, transducin, phosphodiesterase, 5' GMP, cGMP
 - D. rhodopsin, phosphodiesterase, transducin, 5' GMP, cGMP
27. Transducin is a
- A. tyrosine kinase
 - B. G-protein coupled receptor
 - C. heterotrimeric G-protein
 - D. guanylate cyclase
28. Which types of mechanoreceptor found in the skin is most responsible for sensitivity to light touch?
- A. Pacinian corpuscles
 - B. Ruffini's corpuscles and Merkel cells
 - C. Pacinian corpuscles and free nerve endings
 - D. Merkel cells and Meissner's corpuscles
29. Between the retina and the sclera is
- A. the choroid
 - B. vitreous humour
 - C. aqueous humour
 - D. the ciliary body
30. Visual impairment is often associated with albinism in humans primarily due to
- A. decreased retinal production
 - B. lack of iris pigment epithelium melanosomes
 - C. absence of melanin in the choroid
 - D. degeneration of the macula
31. Which of the following is a cause of myopia?
- A. decreased accommodation in aging
 - B. flattened cornea
 - C. axial length of the eyeball is too great
 - D. decreased converging power of the lens

32. The organ of Corti
- A. rests upon the tectorial membrane
 - B. is between the tympanic duct and vestibular duct
 - C. is filled with perilymph
 - D. comprises the cochlea of the inner ear and the vestibule

33. All of the following are special senses except
- A. balance
 - B. hearing
 - C. smell
 - D. proprioception

34. A classic example of a multistable object is shown below:



In this figure, the rabbit and the duck are each a different

- A. proximal stimulus
 - B. distal stimulus
 - C. figure-ground
 - D. percept
35. A person whose prescription for eyeglasses call for -2.25 diopter lenses suffers from
- A. emmetropia
 - B. myopia
 - C. presbyopia
 - D. hyperopia

36. The posterior chamber of the eyeball is filled with
- A. aqueous humour
 - B. vitreous humour
 - C. endolymph
 - D. perilymph

37. When they are not being stimulated by light, rod and cone cells
- A. hyperpolarize and produce a graded potential
 - B. produce action potentials in ganglionic cells
 - C. depolarize and release neurotransmitter
 - D. promote glutamate release by a bipolar cell at its synapse with a ganglionic cell

38. The first site for the neuronal processing of input from the inner ear arriving through the vestibulocochlear nerve is the
- A. cochlear nucleus
 - B. inferior colliculi
 - C. left posterior superior temporal gyrus
 - D. medial geniculate nucleus

39. How many neurons are employed by the spinothalamic tract to convey touch sensation information from a Merkel cell to the somatosensory cortex?
- A. 1
 - B. 2
 - C. 3
 - D. 4

40. Gibson and Walk's 1959 visual cliff study involving infant perception demonstrated that
- A. depth perception is at least partly an in-born trait
 - B. depth perception is learned and subject to classical conditioning
 - C. depth perception is learned and subject to operant conditioning
 - D. depth perception in infants relies solely on monocular cues
41. A patient suffering from PTSD perceives a coat rack in the corner as a human figure immediately upon entering their therapist's office. They have experienced a(n)
- A. phobia
 - B. delusion
 - C. hallucination
 - D. illusion
42. Which of the following is a binocular cue for depth perception?
- A. motion parallax
 - B. accommodation
 - C. linear perspective
 - D. convergence
43. Which of the following occurs with vibrational displacements of a stereocilia bundle of a cochlear hair cell?
- A. depolarization through influx of K^+ leading to an action potential
 - B. hyperpolarization through influx of Cl^-
 - C. alternating depolarization and hyperpolarization involving flow of K^+
 - D. signaling from a G-protein coupled receptor system leading to neurotransmitter release
44. To adapt the eye for short-range focus
- A. Release of tension of the zonular fibers suspending the lens causes the lens to become more spherical.
 - B. Contraction of the ciliary muscle causes the lens to become more flat.
 - C. Relaxation of the ciliary muscle causes the lens to become more spherical.
 - D. Increase of tension of the zonular fibers causes the lens to become more spherical.
45. The modulation of nociceptive projection neurons by nonnociceptive afferent neurons and descending interneurons is the underlying basis of
- A. volley theory
 - B. lateral inhibition
 - C. gate control theory
 - D. phantom pain
46. In signal detection theory there are hits, misses, false alarms, and correct rejections. Which of the following affects the relative frequency of false alarms and misses?
- A. response bias
 - B. just noticeable difference
 - C. signal intensity
 - D. signal-to-noise ratio

47. An experimental subject watches a video in which the syllables “ba-ba” are spoken over the lip movements of “ga-ga”. The subject reports hearing the syllables “da-da”. This demonstrates
- A. perceptual constancy
 - B. top-down processing
 - C. multimodal processing
 - D. the principle of Prägnanz
48. Stimulation of which brain structure improves performance and reaction time in visual change blindness experiments?
- A. superior colliculus
 - B. lateral postcentral gyrus
 - C. reticular formation
 - D. hypothalamus
49. A patient recovering from carbon monoxide poisoning suffers from associative agnosia. The patient can copy or match simple figures and displays knowledge of shape. However they cannot name common objects. Which of the following brain structures is the most likely site of damage?
- A. left occipito-temporal region
 - B. lateral geniculate nucleus
 - C. striate cortex
 - D. optic nerve
50. The taste buds on the tongue sit on raised protrusions of the tongue surface called
- A. microvilli
 - B. papillae
 - C. taste pores
 - D. lingual epithelial cells