30 Extremely Difficult MCQs – Senses (Olfaction, Gustation, Vision)

1. Odor adaptation occurs rapidly despite the low threshold of olfaction mainly because:
A. Olfactory receptors become permanently inactivated
B. Central pathways reduce their responsiveness
C. Supporting cells stop releasing mucus
D. Axons of olfactory nerves degenerate

2. A defect preventing cAMP formation in olfactory receptors would primarily block:
A. Binding of odorants to receptors
B. Opening of Na■ channels
C. Release of neurotransmitter from olfactory bulb
D. Activation of the orbitofrontal cortex

3. A person can smell odors but cannot identify them. Which area is most likely damaged?
A. Primary olfactory cortex
B. Orbitofrontal cortex
C. Hypothalamus
D. Olfactory bulb

4. Methyl mercaptan is effective in detecting gas leaks mainly because:
A. It has a high molecular weight
B. It binds strongly to G proteins
C. It activates olfaction at extremely low concentrations
D. It resists adaptation

5. Olfaction strongly triggers emotional responses primarily because projections reach the:
A. Cerebellum
B. Limbic system
C. Parietal lobe
D. Medulla

6. Failure of Na■ channels in gustatory cells would mostly impair which taste?
A. Bitter
B. Sweet
C. Salty
D. Umami

7. Sweet tastants can depolarize gustatory cells by:
A. Entering through Na■ channels
B. Activating G proteins → second messengers
C. Opening Ca■ channels directly
D. Hyperpolarizing the microvilli

8. The strongest contributor to flavor perception is:
A. Gustation alone
B. Olfaction + gustation integration
C. Texture of food
D. Temperature of food

9. Complete taste adaptation usually occurs within:
A. 1–5 seconds
B. 1–5 minutes

C. 30–45 minutes
D. 10–12 minutes

10. The taste pathway reaches conscious perception in the:
A. Frontal lobe
B. Occipital lobe
C. Parietal lobe
D. Temporal lobe

11. Most of the refraction of light occurs at the:
A. Lens
B. Retina
C. Pupil
D. Cornea

12. The lens contributes to image formation mainly by:
A. Regulating pupil size
B. Adjusting focus via accommodation
C. Preventing scattered light
D. Producing photopigments

13. Accommodation for near vision occurs when the lens becomes:
A. Flatter
B. More curved
C. More transparent
D. Smaller

14. In myopia, images converge:
A. On the retina
B. Behind the retina
C. In front of the retina
D. On the optic disc

15. Which refractive error results from irregular curvature of cornea/lens?
A. Myopia
B. Hyperopia
C. Astigmatism
D. Presbyopia

16. Convergence of eyes increases when:
A. Viewing distant objects
B. Viewing near objects
C. The pupil dilates
D. Rods dominate over cones

17. Which photopigment is found only in rods?
A. Melanopsin
B. Rhodopsin
C. Iodopsin
D. Cytochrome

18. The light-absorbing part of all photopigments is:

A. Opsin
B. Rhodopsin
C. Retinal
D. Melanin

19. Cis-retinal becomes trans-retinal in response to:
A. Darkness
B. Photon absorption
C. Depletion of vitamin A
D. Rod degeneration

20. Separating trans-retinal from opsin is known as:
A. Regeneration
B. Activation
C. Bleaching
D. Isomerization

21. Regeneration of photopigment is faster in:
A. Rods
B. Cones
C. Both equal
D. Neither

22. In darkness, high levels of cGMP in photoreceptors cause:
A. Closure of Na■ channels
B. Opening of Na■ channels
C. Release of glutamate to excite bipolar cells
D. Increased action potentials in ganglion cells

23. Light decreases glutamate release because:
A. It increases cGMP
B. It blocks Na■ influx
C. It activates enzymes that break down cGMP
D. It depolarizes the photoreceptor

24. The optic nerves partially cross at the:
A. Optic radiations
B. Lateral geniculate nucleus
C. Optic chiasm
D. Optic tract

25. Fibers from the nasal retina:
A. Do not cross
B. Completely cross
C. Project only to the midbrain
D. End at the cerebellum

26. Visual perception begins in the:
A. Primary visual cortex
B. Optic nerve
C. Optic chiasm
D. Midbrain

27. Action potentials leave the retina through:
A. Bipolar cells
B. Rods
C. Cones
D. Ganglion cell axons

28. Which muscle helps rotate the eye downward and laterally?
A. Superior rectus
B. Inferior oblique
C. Superior oblique
D. Lateral rectus

29. A sty forms due to infection of:
A. Meibomian glands
B. Matrix cells of the cornea
C. Sebaceous ciliary glands
D. Lacrimal puncta

30. Tears drain into the nose through the:
A. Lacrimal canaliculi
B. Lacrimal sac
C. Nasolacrimal duct
D. Conjunctival cavity

ANSWER KEY:
1-B, 2-B, 3-B, 4-C, 5-B, 6-C, 7-B, 8-B, 9-B, 10-C,
11-D, 12-B, 13-B, 14-C, 15-C, 16-B, 17-B, 18-C, 19-B, 20-C,
21-B, 22-B, 23-C, 24-C, 25-B, 26-A, 27-D, 28-C, 29-C, 30-C