Part I. Clinical Applications

1. An infant girl with strabismus is brought into the clinic. Describe what the condition is and what therapy should be tried before surgery?

Strabismus is a misalignment of the visual axes and loss of binocular vision. It can be due to an underacting or overacting eye muscle, abnormal innervation, physical trauma, or a central processing problem. The condition is particularly dangerous in infants as it can result in permanent loss of vision in the “weaker” eye if not corrected during early childhood. Initial therapy usually includes intermittent patching of the good eye before more invasive procedures such as surgery.

2. A man in his early 60’s come into the clinic complaining of fuzzy vision. An eye examination reveals clouding of his lenses. What is his problem and what factors might have contributed to it?

The condition is cataracts. The lens becomes cloudy due to changes in the structure of the lens crystallin proteins. Cataracts often occur with aging but may also be caused by smoking, injury, excessive exposure to ultraviolet rays, certain medications (such as long-term use of steroids), or complications of other diseases (diabetes).

3. Albinism is a condition in which melanin pigment is not made. How does albinism affect vision and why?

People with albinism generally have poor vision because, without pigment within the eye (in the choroid and pigmented layer of the retina), light scatters before it can be properly focused.

4. A child is brought to the speech therapist because she does not pronounce high-pitched sounds (like “s”). If it is determined that the spiral organ of Corti is the source of the problem, which region of the organ would be defective?

The proximal end of the organ of Corti, close to the oval window.

5. When Mrs. Martinez visits her ophthalmologist, she complains of vision loss in her right eye. The intraocular pressure of that eye is found to be abnormally elevated. What is the name of Mrs. Martinez’s probable condition? What causes it? What might be the outcome if the problem is not corrected?

The condition is Glaucoma. The cause is an abnormally high intraocular pressure due to a buildup of aqueous humor which may be due to an over production of aqueous humor or in most cases, an inadequate drainage of aqueous humor. If not corrected the persistent pressure results in a progression from mild visual impairment to irreversible destruction of neurons in the retina, damage to the optic nerve, and blindness.
Part II
1. refraction  4. hyperopia  7. myopia
2. accommodation  5. night blindness  8. astigmatism
3. emmetropia  6. cataract  9. glaucoma

Part III
1. E  14. C  27. haircells
2. I  15. B  28. myopia
5. K  18. G  31. conjunctivitis
6. N  19. eardrum  32. strabismus
7. A  20. malleus  33. otitis media
8. F  21. incus  34. anosmia
9. L  22. stapes  35. Meniere’s disease
10. K  23. oval window  36. cataract
11. N  24. perilymph  37. trachoma
12. B  25. membrane  38. ptosis
13. M  26. endolymph

Part IV
1. pupil  13. iris  24. ciliary body
2. conjunctiva  14. posterior chamber of  25. choroid
3. scleral venous sinus  15. lens  26. scleral venous sinus
   (canal of Schlemm)  16. anterior border of retina  27. retina
4. Zonular fibers  17. extrinsic eye muscle  28. vitreous humor
5. ciliary body  18. vitreous chamber with  29. choroid
6. retina  19. vitreous body  30. ciliary body
7. choroid  20. zonular fibers  31. iris
8. sclera  21. aqueous humor  32. fovea centralis
9. opitic disk (blind spot)  22. sclera  33. cornea
10. Optic nerve  23. optic disk (blind spot)  34. iris
11. cornea  24. ciliary body
12. anterior chamber of  25. choroid
   anterior cavity  26. scleral venous sinus

Part V
1. three  13. external auditory canal; tympanic; higher; directly; ossicles (ear bones)
2. blue  14. stapes; oval; perilymph; vestibuli; tympani; round
3. green
4. red
5. at the same time
6. total color blindness
7. males
8. rods
9. C
10. R
11. C
12. R
13. external auditory canal; tympanic; higher; directly; ossicles (ear bones)
15. spiral; basilar; apex; base
16. tectorial; cochlear; VIII (auditory); thalamus; temporal
17. auditory tube
18. tympanic membrane
19. oval window
20. malleus
21. incus
22. sclera
23. central fovea
24. cornea
25. pupil
26. iris
27. ciliary muscle
28. scleral venous sinus (canal of Schlemm)

Part VI
1. maculae; utricle; saccule
2. stereocilia; kinocilium
3. otolithic membrane
4. vestibular; VIII
5. crista ampularis; acceleration or deceleration
6. cupula
7. motion sickness
8. senile macular degeneration
9. otitis media
10. sensorineural deafness
11. Meniere’s syndrome
12. conduction deafness
13. T
14. T
15. F
16. oval
17. cones
18. aqueous humor
30. semicircular canals
31. bony labyrinth
32. endolymph
33. perilymph
34. membranous labyrinth
35. vestibule
36. utricle and saccule
37. ampula