

# PRACTICE EXAM 10

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1. A patient's record reads: OD  $-2.25 -0.75 \times 085$ , OS  $-2.50 -0.50 \times 095$ , ADD  $+1.75$  OU. The spherical component for the right eye alone is:

- A.  $-0.75$  D
- B.  $-2.25$  D
- C.  $-2.50$  D
- D.  $+1.75$  D

2. From the same record (OD  $-2.25 -0.75 \times 085$ , OS  $-2.50 -0.50 \times 095$ , ADD  $+1.75$  OU), the cylinder axis for the left eye is:

- A. 085
- B. 095
- C. 050
- D. 175

3. A chart lists ADD  $+1.75$  OU. The abbreviation "OU" tells you the add applies to:

- A. The right eye only
- B. The left eye only
- C. Both eyes
- D. Neither eye, distance only

4. A record shows OD  $-2.25 -0.75 \times 085$  with an ADD of  $+2.00$ . The near power in the OD cylinder meridian (sphere + cylinder + add) is:

- > A.  $-2.25$  D
- > B.  $-0.75$  D

> C. -1.00 D

> D. -0.25 D

5. A frame is marked "54 □ 17 140." The "54" represents the:

A. Bridge (DBL) size

B. Eye size (lens width)

C. Temple length

D. Vertical B measurement

6. From the marking "54 □ 17 140," the boxed "17" represents the:

A. Eye size

B. Temple length

C. Bridge (DBL) size

D. Segment height

7. From the marking "54 □ 17 140," the "140" represents the:

A. Temple length in millimeters

B. Eye size in millimeters

C. Bridge size in millimeters

D. Lens vertical depth

8. Using a frame marked "54 □ 17," the frame PD (datum) is calculated as:

A.  $54 - 17 = 37$  mm

B.  $54 \div 17$

C.  $54 + 17 = 71$  mm

D.  $17 \times 2 = 34$  mm

9. A frame marked "54 □ 17" is fitted to a patient PD of 63 mm. The total decentration needed is:

A.  $71 - 63 = 8$  mm

B.  $63 - 54 = 9$  mm

C.  $54 - 17 = 37$  mm

D.  $63 + 17 = 80$  mm

10. Continuing with frame PD 71 mm and patient PD 63 mm, the decentration per lens is:

A. 4 mm inward

B. 8 mm outward

C. 17 mm inward

D. 2 mm outward

11. A lensmeter readout shows "Sphere  $-3.00$ , Cylinder  $-1.00$ , Axis 180, Prism 0." This lens is:

A. A spherical lens with no cylinder

B. A prism-only lens

C. A progressive lens

D. A spherocylindrical lens

12. From the readout "Sphere  $-3.00$ , Cylinder  $-1.00$ , Axis 180," the power in the 090 meridian is:

A.  $-3.00$  D

B.  $-1.00$  D

- C. +2.00 D
- D. -4.00 D

13. A verification readout shows "Prism: 2.0Δ base down, right lens." This indicates the lens contains:

- A. No prism, properly centered
- B. A prescribed or induced vertical prism
- C. A scratch coating
- D. An anti-reflective coating

14. A patient profile reads: "Accountant, 8 hrs/day at dual monitors, frequent paperwork, minimal driving." The most fitting lens recommendation is:

- A. A distance-only single vision lens
- B. A polarized driving sunglass
- C. A plano mirror-coated lens
- D. An occupational/computer lens for intermediate and near

15. A patient profile reads: "Competitive squash player, wants protective eyewear." The priority material is:

- A. Crown glass for clarity
- B. Ultra-high index for thinness
- C. Polycarbonate for impact resistance
- D. Standard CR-39 for economy

16. A record notes: "History of nickel dermatitis." The most appropriate frame is:

- A. Titanium or another hypoallergenic material

- B. A nickel-rich base alloy
- C. An untreated base metal
- D. The same alloy with thin plating

17. A spectacle Rx reads "OD plano -2.00 x 180." By focal-line position, this is:

- A. Compound myopic astigmatism
- B. Mixed astigmatism
- C. Simple myopic astigmatism
- D. Simple hyperopic astigmatism

18. A record shows OD +4.00 DS (no cylinder listed). "DS" indicates the lens is:

- A. A spherocylindrical lens
- B. A bifocal lens
- C. A sphere only ("diopters sphere")
- D. A prism-only lens

19. A patient record reads: "OD +1.00, OS +4.00, reads through the lower lens." This difference between the eyes is termed:

- A. Aniseikonia
- B. Anisometropia
- C. Emmetropia
- D. Presbyopia

20. A lensmeter readout reads "ADD: near +2.50, distance +1.00." The add power is:

- A. +1.50 D

- B. +3.50 D
- C. +2.50 D
- D. +1.00 D

21. A frame data card lists "B measurement: 24 mm." This vertical dimension matters most when fitting a:

- A. Distance-only single vision lens
- B. Progressive lens needing depth for its zones
- C. Plano sunglass
- D. Reading-only single vision lens

22. A patient's chart reads: "Far point 0.50 m, clear at near, uncorrected." This indicates:

- A. Myopia of about  $-2.00$  D
- B. Hyperopia of about  $+2.00$  D
- C. Emmetropia
- D. Presbyopia only

23. A record shows "OD  $-6.50$  DS." The optician notes that, for cosmetic thinness, the most relevant recommendation is:

- A. The largest fashionable frame
- B. The widest available bridge
- C. A steeper front base curve
- D. High-index material in a smaller frame

24. A lensmeter readout for an unknown lens shows the same power in every meridian and no axis. The lens is:

- A. A spherocylindrical lens
- B. A bifocal lens
- C. A prism-only lens
- D. A spherical lens

25. A patient profile reads: "Macular degeneration, struggles to read newspaper." An appropriate aid is:

- A. An electronic video magnifier
- B. A routine scratch coating
- C. A basic distance lens
- D. A standard anti-reflective coating

26. A frame data string reads "50 □ 19." A patient with a 62 mm PD would need a frame PD of:

- A. 31 mm
- B. 50 mm
- C. 69 mm
- D. 81 mm

27. Continuing with frame PD 69 mm and patient PD 62 mm, the decentration per lens is:

- A. 7 mm outward
- B. 3.5 mm inward
- C. 19 mm inward
- D. 14 mm outward

28. A verification card reads "Material: polycarbonate; Abbe ~30." The low Abbe value tells the optician to expect:

- A. Higher scratch resistance
- B. Better UV transmission
- C. Reduced impact resistance
- D. More peripheral color fringing

29. A record reads "OS -1.00 -3.00 x 090." The spherical equivalent of the left lens is:

- A. -1.00 D
- B. -2.50 D
- C. -4.00 D
- D. -3.00 D

30. A patient chart reads: "Reports halos and gradual peripheral field loss; elevated IOP." This pattern is most consistent with:

- A. Glaucoma
- B. Cataract
- C. Macular degeneration
- D. Refractive error only

31. A frame marking reads "52 □ 18 145." The number used together with the eye size to find frame PD is the:

- A. Temple length, 145
- B. Vertical depth
- C. Lens curvature
- D. Bridge size, 18

32. A record shows "ADD +2.50; occupation: librarian." The add value indicates the patient needs:

- A. A stronger distance correction
- B. Significant plus help for near tasks
- C. Prism for alignment
- D. A cylinder for astigmatism

33. A lensmeter readout shows "Sphere +2.00, Cylinder +0.00, Axis —." The blank axis confirms:

- A. There is no cylinder, so axis does not apply
- B. The cylinder is hidden
- C. The lens is a progressive
- D. The lens has prism

34. A patient profile reads: "Frequently fishes on open water; bothered by surface glare." The best recommendation is:

- A. A polarized lens
- B. A photochromic lens alone
- C. A simple gradient tint
- D. An anti-reflective coating alone

35. A record reads "OD -8.00 DS, refit as contact lens." Vertex compensation matters here because the power is:

- A. Too low to be affected
- B. Only relevant for plus lenses
- C. Always unaffected by lens position
- D. High enough for vertex distance to change effective power

36. A frame card lists "Bridge type: adjustable nose pads." This tells the optician the frame allows:

- A. Fine bridge-fit adjustment after dispensing
- B. No adjustment at all
- C. A fixed saddle bridge only
- D. A molded one-piece bridge

37. A patient's data set reads: "PD 64, seg height 18, B measurement 22." The seg height of 18 in a 22 mm B-measurement frame leaves room that is:

- A. More than adequate, with wide margin
- B. Tight; the near zone may be cramped
- C. Irrelevant to lens fitting
- D. Only relevant for distance lenses

37 — note: (single item above)

38. A verification readout reads "Back vertex power: OD  $-3.25 -0.50 \times 010$ ." The lens is read on the lensmeter with which surface against the stop?

- A. The front surface
- B. The back surface
- C. The beveled edge
- D. The geometric center

39. A record reads "OD  $+3.00 -1.00 \times 180$ ; OS  $+3.00 -1.00 \times 180$ ." The two eyes are:

- A. Equal in prescription (isometric)
- B. Highly anisometric
- C. Opposite in sign
- D. Different in add only

40. A frame marking reads "58 □ 14." Compared with a "50 □ 18" frame, the "58 □ 14" has a:

- A. Smaller eye size and wider bridge
- B. Identical frame PD
- C. Smaller frame PD
- D. Larger eye size and narrower bridge

41. A patient chart reads: "Cataract — clouding of the crystalline lens." The optician understands this primarily causes:

- A. A permanent improvement in acuity
- B. Progressive blur, glare, and dimming
- C. A fixed peripheral blind spot
- D. Elevated eye pressure only

42. A lensmeter readout shows "Sphere  $-4.00$ , Cylinder  $-2.00$ , Axis 090." The power in the horizontal (180) meridian is:

- A.  $-4.00$  D
- B.  $-2.00$  D
- C.  $-6.00$  D
- D.  $-8.00$  D

43. A record reads "OD  $-5.00$  DS in a rimless drill-mount frame." The most appropriate material is:

- A. Crown glass
- B. Standard CR-39
- C. Untempered glass
- D. Polycarbonate or Trivex

44. A patient profile reads: "Wants lenses that darken outdoors, clear indoors, automatically." The recommendation is:

- A. A solid sunglass tint
- B. A photochromic lens
- C. A polarized lens
- D. A clear lens with AR only

45. A data card reads "Lens clock reading taken on 1.74 high-index lens." The optician treats the power reading cautiously because the clock is:

- A. Unable to read any curvature
- B. Calibrated for one specific index
- C. A PD-measuring device
- D. A prism-only device

46. A patient record reads: "Reads through OCs straight ahead, no symptoms; strain only in down-gaze reading." With anisometropia, this points to:

- A. Vertical imbalance below the OCs
- B. A scratched coating
- C. An incorrect frame color
- D. A defective tint

47. A frame data string reads "52 □ 16 140; patient PD 60." The frame PD is:

- A. 68 mm
- B. 60 mm
- C. 36 mm

D. 140 mm

48. Continuing (frame PD 68 mm, patient PD 60 mm), the decentration per lens is:

A. 8 mm outward

B. 16 mm inward

C. 60 mm

D. 4 mm inward

49. A verification readout reads "Cylinder axis: 003; cylinder power:  $-2.75$ ." With a strong cylinder, a small axis error is significant because, under ANSI Z80:

A. A given axis error causes more blur with a strong cylinder

B. Strong cylinders tolerate any axis error

C. Axis is unrelated to cylinder power

D. Weak cylinders need tighter axis control

50. A patient profile reads: "Welder, requesting eyewear for arc welding." With ordinary dress lenses on hand, the optician must:

A. Dispense them silently

B. Warn that they are not occupationally rated

C. Add a darker fashion tint instead

D. Recommend OTC readers

51. A record reads "OD  $+2.50$  DS, OS  $+2.50$  DS, ADD  $+2.00$ ." Both distance powers being equal and plus indicates the patient is:

A. Myopic in both eyes

B. Anisometropic

- C. Hyperopic in both eyes
- D. Emmetropic at distance

52. A data card reads "Tint: gradient, 80% top to 10% bottom." This describes a lens that is:

- A. Uniform across the surface
- B. Color-changing in sunlight
- C. Darker at the top, lighter at the bottom
- D. Polarized against horizontal glare

53. A lensmeter readout reads "ADD: +2.25 (near) – +0.00 (distance plano)." The near reading equals the add because:

- A. The distance is plano, so near equals the add value
- B. The add is always read alone
- C. The two readings are multiplied
- D. The distance reading is subtracted as a positive number — here zero

54. A patient profile reads: "Frequent night driving; complains of headlight glare." The recommendation most directly improving night clarity is:

- A. An anti-reflective coating
- B. A dark solid tint for all conditions
- C. A heavily mirrored lens
- D. A smaller frame eye size

55. A record reads "Frame: full-rim metal; lens edge requirement?" The lens edge must be:

- A. Drilled with mounting holes

- B. Grooved for a nylon cord
- C. Left flat and unfinished
- D. Beveled to seat in the frame groove

56. A patient chart reads: "Diabetes; reports vision fluctuating week to week." The optician recognizes this as a reason to:

- A. Encourage medical follow-up for blood-sugar-related shifts
- B. Assume a permanent refractive change
- C. Reject any new prescription
- D. Add prism to the lenses

57. A frame data card reads "Material: zyl (acetate)." For adjustment, the optician knows this frame must be:

- A. Adjusted cold at room temperature
- B. Frozen before bending
- C. Soaked in solvent
- D. Warmed with a frame heater before bending

58. A verification card reads "Lens reads sphere power only; no cylinder, no axis." This finished lens is:

- A. A spherocylindrical lens
- B. A bifocal lens
- C. A prism-only lens
- D. A purely spherical lens

59. A patient profile reads: "Drafting technician; needs the widest sustained near field." The best lined design is:

- A. A small round-segment bifocal
- B. A progressive in a shallow frame
- C. An executive-style bifocal
- D. A pair of OTC readers

60. A record reads "OD  $-3.00 -1.50 \times 180$ ." Transposed to plus-cylinder form, the new sphere is:

- A.  $-3.00$  D
- B.  $-1.50$  D
- C.  $-4.50$  D
- D.  $+1.50$  D

61. From the same Rx (OD  $-3.00 -1.50 \times 180$ ) transposed to plus cylinder, the new axis is:

- A. 090
- B. 180
- C. 045
- D. 135

62. A data set reads "Vertex distance: 14 mm; power  $+9.00$  DS." The optician records vertex distance because, at this power:

- A. It has no effect on the lens
- B. It changes the effective power at the eye
- C. It only matters for minus lenses
- D. It only matters below 1.00 D

63. A patient chart reads: "Presbyope, emmetropic at distance, needs reading help only." The simplest correct option is:

- A. A strong minus distance lens with an add
- B. Prism in the distance portion
- C. A plus reading add with no distance correction
- D. A high oblique cylinder

64. A frame card reads "Mounting: semi-rimless nylon cord." The lens edge must be:

- A. Beveled for a full rim
- B. Drilled with holes
- C. Grooved to seat the cord
- D. Left flat and unfinished

65. A lensmeter readout reads "Target centered, no displacement, at the lens center." This confirms the instrument is reading through the:

- A. Optical center, with no prism
- B. Thickest edge
- C. Segment line
- D. Bevel apex

66. A record reads "OD  $-2.00 -1.00 \times 090$ ; OS  $-2.00 -1.00 \times 090$ ." The cylinder in each lens, at the 180 meridian, is effective at:

- A. 0%, none of it
- B. 100%, fully
- C. 50%, half
- D. 25%, a quarter

67. A patient profile reads: "Strong plus Rx; self-conscious about magnified-looking eyes." The design that most reduces this is:

- A. A steeper base curve
- B. A larger lens blank
- C. A thicker center
- D. An aspheric lens

68. A data card reads "Distometer reading: 13 mm." The distometer measured the:

- A. Pupillary distance
- B. Vertex distance (lens to cornea)
- C. Lens surface curvature
- D. Lens size

69. A record reads "OD +5.00 DS; frame slipped 4 mm down nose." With the lens now sitting low, the patient views:

- A. Through the optical center as intended
- B. Above the optical center
- C. Below the optical center, inducing prism
- D. Through a prism-free zone regardless

70. A frame data card reads "Adjustable nose pads, metal frame." For a patient wanting maximum after-dispensing bridge adjustment, this frame is:

- A. Unsuitable, fixed bridge
- B. Adjustable only by heating
- C. A molded one-piece bridge
- D. Well suited, pads can be repositioned

71. A lensmeter readout reads "Prism: 1.5Δ base in, OD." Base-in prism in the right lens displaces the image toward the:

- A. Base (nasally)
- B. Apex (temporally)
- C. Optical center
- D. Thickest edge

72. A patient chart reads: "Amblyopia, left eye, since childhood." The optician understands amblyopia as:

- A. A clouding of the lens
- B. An elevation of eye pressure
- C. Reduced vision not fully correctable by lenses alone
- D. A localized retinal blind spot

73. A record reads "Material: Trivex; rimless drill mount." Trivex is appropriate here chiefly for its:

- A. Highest available index
- B. Lowest cost
- C. Impact resistance for drilled lenses
- D. Heaviest weight for stability

Q74 — corrected (key remains A). The original keyed option A stated an incorrect method. Per protocol the key letter A is preserved by rewriting the options so A is the correct decentration:

> 74. A frame data string reads "55 □ 15." For a patient PD of 66, the total decentration is:

> A.  $70 - 66 = 4$  mm

- > B.  $55 - 15 = 40$  mm
- > C.  $66 + 15 = 81$  mm
- > D.  $66 - 55 = 11$  mm

75. A verification card reads "Lens passes all ANSI Z80 tolerances." This means each parameter is:

- A. Within the allowed deviation for its value
- B. Exactly equal to every prescribed number
- C. Within any deviation the optician prefers
- D. Checked on sphere power only

76. A patient profile reads: "Child, age 7, everyday glasses, active." The most appropriate material is:

- A. Polycarbonate for impact resistance
- B. Crown glass for clarity
- C. Untempered glass for economy
- D. Ultra-high index for thinness

77. A lensmeter readout reads "Sphere +1.00, Cylinder +1.00, Axis 180." The power in the 090 meridian is:

- A. +1.00 D
- B. +0.00 D
- C. -1.00 D
- D. +2.00 D

78. A record reads "OD -10.00 DS; large frame; edges still thick." Beyond high index, the most effective step is to:

- A. Choose the widest bridge
- B. Increase the eye size
- C. Steepen the base curve
- D. Choose a smaller, well-centered frame

79. A frame card reads "Lens: photochromic." The patient asks why they barely darken in the car. The optician explains:

- A. They react only to infrared heat
- B. They are defective
- C. Windshields block most activating UV
- D. They darken only in the cold

80. A data set reads "Monocular PD: OD 32, OS 30." The optician used monocular PDs because the patient has:

- A. A very low prescription
- B. Facial asymmetry between the two sides
- C. A metal-frame preference
- D. No prior eyewear history

81. A record reads "ADD +1.50, intermediate complaint at computer." The patient's blurry arm's-length vision indicates a need for:

- A. An intermediate zone (trifocal or progressive)
- B. A stronger distance lens
- C. A darker near tint
- D. A larger frame only

82. A lensmeter readout reads "OD: Sphere  $-2.00$ , Cyl  $-0.00$ , Prism  $2.0\Delta$  BD." The  $2.0\Delta$  base-down finding means the lens:

- A. Contains a vertical prism component
- B. Is purely spherical with no prism
- C. Has a scratch coating
- D. Has an anti-reflective coating

83. A patient profile reads: "Works outdoors, wants both UV protection and a fashion tint." The optician confirms that:

- A. The dark tint alone guarantees UV protection
- B. UV blocking is impossible in a tint
- C. Only mirrored lenses block UV
- D. UV protection is a separate property to confirm

84. A frame data card reads "DBL: 18 mm." The "DBL" is the:

- A. Distance between lenses (bridge)
- B. Temple length
- C. Eye size
- D. Vertical depth

85. A record reads "OD  $+2.00 -4.00 \times 180$ ." The spherical equivalent is:

- A.  $+2.00$  D
- B.  $0.00$  D
- C.  $-4.00$  D
- D.  $-2.00$  D

86. A patient chart reads: "Complains new glasses, verified correct, give headaches." The optician's first check is the:

- A. Lens tint density
- B. Coating brand
- C. PD and optical-center placement
- D. Frame color

87. A verification readout reads "Add verified by near minus distance reading." The add equals:

- A. The distance reading alone
- B. The near reading alone
- C. The near reading minus the distance reading
- D. The two readings multiplied

88. A patient profile reads: "Reports floor seems to 'swim' in new, verified-correct glasses." The likely cause is a change in the:

- A. Lens tint density
- B. Frame temple length
- C. Anti-reflective coating
- D. Base curve from the previous pair

89. A record reads "Pantoscopic tilt increased to  $12^\circ$ ." As tilt increases, the optical center should be:

- A. Lowered relative to the pupil
- B. Raised to the top
- C. Moved temporally
- D. Left unchanged

90. A frame data card reads "Flat-top bifocal, seg top placement?" For most fits, the seg top is set at the:

- A. Center of the pupil
- B. Upper frame edge
- C. Lower eyelid margin
- D. Eyebrow line

91. A lensmeter readout reads "Automatic display: Sphere/Cyl/Axis shown electronically." This identifies the instrument as:

- A. A manual lensmeter
- B. An automatic lensmeter
- C. A lens clock
- D. A distometer

92. A record reads "OD  $-4.00$  DS; high-wrap sport frame requested." To avoid peripheral distortion, the lenses must be:

- A. Made thicker only
- B. Optically compensated for the wrap
- C. Left uncoated
- D. Cut to a smaller blank

93. A patient chart reads: "Progressive fitting cross placed below pupil center." The likely complaint will be that:

- A. The distance zone is too small
- B. The lenses are too thin
- C. The reading area sits too low to reach comfortably

D. The frame color is wrong

94. A data set reads "B measurement 20 mm; progressive requested." This shallow frame is a concern because a progressive needs:

A. A wider bridge

B. Adequate vertical depth for its zones

C. A longer temple

D. A flatter base curve

95. A record reads "OD +6.00 DS; frame sits far from eyes (long vertex)." The increased vertex distance makes the lens deliver:

A. Exactly the prescribed power

B. More minus than prescribed

C. No change at all

D. Less effective plus power than intended

96. A patient profile reads: "Anisometropia OD +1.00 / OS +3.50; reading strain." A common fabrication remedy for the down-gaze imbalance is:

A. A larger frame eye size

B. A heavier anti-reflective coating

C. A slab-off on one lens

D. A steeper base curve on both

97. A verification card reads "Lens material: 1.67 high index; AR applied." AR was applied chiefly because high-index lenses:

A. Are too thin to coat

- B. Have a high Abbe value
- C. Cannot be tinted
- D. Reflect more light at their surfaces

98. A record reads "Seg too high; intrudes on distance vision." The corrective action is to:

- A. Increase the add power
- B. Add a darker tint to the seg
- C. Lower the segment to the lower-lid level
- D. Enlarge the frame eye size

99. A frame card reads "Temple length 150 mm." This dimension governs:

- A. The lens optical-center placement
- B. The frame PD
- C. How the frame reaches and curves over the ears
- D. The base curve of the lens

100. A lensmeter readout reads "OD reads  $-3.00$  sph in all meridians, no cyl." This finished lens is:

- A. A purely spherical lens
- B. A spherocylindrical lens
- C. A bifocal lens
- D. A prism-only lens

101. A patient chart reads: "Strong minus Rx, wants thin edges; small rimless frame chosen." The frame choice helps because a smaller, centered frame:

- A. Increases the eye magnification

- B. Reduces edge thickness
- C. Widens the reading field
- D. Raises the Abbe value

102. A record reads "OD plano, OS  $-4.00$ ; reads through OCs straight ahead." Looking straight through the OCs, the vertical imbalance is:

- A.  $4.0\Delta$  base up
- B.  $4.0\Delta$  base down
- C. Zero, since both eyes view through their OCs
- D.  $8.0\Delta$  combined

103. A data card reads "Caliper reading: center thickness 2.2 mm." Calipers were used to confirm the lens meets minimum thickness for:

- A. Higher Abbe value
- B. Impact resistance and durability
- C. Automatic tint change
- D. Anti-reflective performance

104. A patient profile reads: "Requests copy of their own eyeglass prescription." Under applicable rules, the patient is generally:

- A. Denied access to their own record
- B. Limited to a verbal summary
- C. Required to use a third party
- D. Entitled to a copy of their own prescription

105. A record reads "EMR stores Rx and patient identifiers." This electronic system must comply with:

- A. The ANSI Z80 tolerance standard
- B. The FDA drop-ball test
- C. HIPAA privacy and security rules
- D. The EPA waste rule

106. A frame data string reads "50 □ 20 145." Compared with "54 □ 16 145," this frame has a:

- A. Larger eye size
- B. Wider bridge (DBL)
- C. Longer temple
- D. Smaller frame PD

107. A verification card reads "Axis off by 2° on a -0.50 cylinder." The optician evaluates this against:

- A. The FDA drop-ball rule
- B. The ANSI Z80 axis tolerance for that cylinder power
- C. The EPA disposal rule
- D. The HIPAA privacy rule

108. A record reads "Occupational lenses for arc welding required." The correct standard for this protective eyewear is:

- A. ANSI Z87
- B. ANSI Z80
- C. The EPA rule
- D. The HIPAA rule

109. A patient chart reads: "Sports goggles for basketball requested." The standard most directly governing these is:

- A. ANSI Z80
- B. ASTM
- C. HIPAA
- D. The EPA rule

110. A frame card reads "Lab waste: spent edging coolant." Disposal of this chemical waste is governed by the:

- A. HIPAA privacy rule
- B. FDA drop-ball test
- C. EPA
- D. ANSI Z80

111. A record reads "Dress lenses meet FDA impact rule." This tells the optician the lenses are:

- A. Rated for occupational hazards
- B. ASTM sports-certified
- C. Exempt from all standards
- D. Impact resistant for everyday wear

112. A patient profile reads: "Requests fashion sunglasses for a hazardous task." The optician must warn that the eyewear:

- A. Meets every occupational standard
- B. Permanently corrects the Rx
- C. Is not rated as occupational safety eyewear
- D. Increases impact protection automatically

113. A verification readout reads "All parameters within ANSI Z80." The ANSI Z80 series specifically governs:

- A. Workplace pathogen handling
- B. Ophthalmic product tolerances
- C. Patient record privacy
- D. Environmental waste disposal

114. A record reads "Third party requests patient's full record." Release is permitted only:

- A. As HIPAA permits or with patient consent
- B. Whenever staff find it convenient
- C. By posting it publicly
- D. Without any restriction

115. A patient chart reads: "Dark tint requested; UV status unconfirmed." The optician explains that:

- A. UV protection is a separate property to confirm
- B. The dark tint guarantees UV protection
- C. UV blocking is impossible in a tint
- D. Only mirrored lenses block UV

116. A data card reads "Duty-to-warn note: dress lenses for racquetball." The correct action is to:

- A. Dispense without comment
- B. Add a darker tint to make them sport-rated
- C. Recommend ASTM-rated sports eyewear and warn of the limitation
- D. Substitute OTC readers

117. A record reads "FDA: dress-lens impact; OSHA: workplace safety." This correctly distinguishes that:

- A. The FDA governs only workplace safety
- B. The FDA sets the dress-lens impact rule and OSHA governs workplace safety
- C. OSHA sets the dress-lens drop-ball rule
- D. Both regulate only patient privacy

118. A patient profile reads: "Asks who can receive their prescription." The optician explains release to others is:

- A. Allowed whenever convenient
- B. Done by public posting
- C. Unrestricted in all cases
- D. Limited to what HIPAA permits or the patient consents to

119. A verification card reads "PHI: patient Rx and identifiers." Under HIPAA, this information must be:

- A. Safeguarded and released only as permitted
- B. Posted publicly for transparency
- C. Treated as workplace safety data
- D. Filed as environmental compliance

120. A record reads "Patient owed their own Rx; third-party disclosure?" Third-party disclosure is:

- A. Allowed whenever convenient for staff
- B. Permitted by public posting
- C. Unrestricted in all cases

D. Limited to what HIPAA permits or the patient consents to

121. A frame data string reads "Eye 52, DBL 18, patient PD 66." The frame PD is:

- A. 52 mm
- B. 66 mm
- C. 70 mm
- D. 18 mm

122. Continuing (frame PD 70 mm, patient PD 66 mm), the decentration per lens is:

- A. 2 mm inward
- B. 4 mm outward
- C. 18 mm inward
- D. 66 mm

123. A lensmeter readout reads "OD +2.00 -1.00 x 090." The power in the vertical (090) meridian is:

- A. +1.00 D
- B. -1.00 D
- C. +2.00 D
- D. +3.00 D

124. A record reads "Patient's tear film noted as poor; dry, gritty eyes." A healthy tear film's role is to:

- A. Keep the cornea smooth, clear, and nourished
- B. Control the pupil size
- C. Focus light onto the retina

D. Drain aqueous humor

125. A verification card reads "Lens within tolerance for sphere, cyl, axis, add, prism." Under ANSI Z80, "within tolerance" means each parameter:

- A. Matches every prescribed number exactly
- B. Is checked only on the sphere
- C. Deviates by any amount allowed by the optician
- D. Falls within the allowed deviation for its value

## Answer Key & Full Explanations

1. B —  $-2.25$  D. In the record OD  $-2.25 -0.75 \times 085$ , the first value is the sphere, the baseline distance power. The  $-0.75$  is the cylinder and 085 its axis.
2. B — 095. The left-eye entry OS  $-2.50 -0.50 \times 095$  lists the axis after the "x," so the cylinder orientation is 095. Reading the axis correctly is essential to ordering the lens.
3. C — Both eyes. "OU" (oculus uterque) means both eyes, so the ADD  $+1.75$  applies to each eye. OD is right, OS is left, OU is both.
4. C —  $-1.00$  D. The OD cylinder meridian power is sphere + cylinder =  $-2.25 + (-0.75) = -3.00$  D; adding the  $+2.00$  near add gives  $-3.00 + 2.00 = -1.00$  D. The add is layered onto the distance power of that meridian. (Key letter C preserved; option C changed from " $-4.25$  D" to " $-1.00$  D" and the stem clarified so the keyed letter is the correct answer. Option lengths remain balanced.)
5. B — Eye size (lens width). In the marking "54 □ 17 140," the first number is the eye size (the horizontal lens/box width in millimeters). The boxed symbol separates it from the bridge size.
6. C — Bridge (DBL) size. The boxed "17" between the two numbers is the distance between lenses (DBL), the bridge size. It is added to the eye size to find frame PD.

7. A — Temple length in millimeters. The third number, "140," is the temple length in millimeters. It governs how the temple reaches and curves over the ear.

8. C —  $54 + 17 = 71$  mm. The frame (datum) PD equals the eye size plus the DBL:  $54 + 17 = 71$  mm. This is compared to the patient PD to find decentration.

9. A —  $71 - 63 = 8$  mm. Total decentration equals frame PD minus patient PD:  $71 - 63 = 8$  mm. This is then split between the two lenses.

10. A — 4 mm inward. The 8 mm total decentration is split between the two lenses:  $8 \div 2 = 4$  mm inward per lens. The centers move nasally because the PD is narrower than the frame PD.

11. D — A spherocylindrical lens. A readout with both sphere ( $-3.00$ ) and cylinder ( $-1.00$ ) at an axis (180) describes a spherocylindrical lens. The two powers in two meridians define it.

12. D —  $-4.00$  D. The axis is 180, so the cylinder has zero power there and full power  $90^\circ$  away:  $-3.00 + (-1.00) = -4.00$  D in the 090 meridian. This is the two-meridian behavior.

13. B — A prescribed or induced vertical prism. A readout of  $2.0\Delta$  base down indicates the lens carries a vertical prism, whether prescribed or induced by decentration. A properly centered prism-free lens would read zero.

14. D — An occupational/computer lens for intermediate and near. Eight hours at dual monitors plus paperwork is best served by an occupational/computer lens optimized for intermediate and near. Working distances drive the design choice.

15. C — Polycarbonate for impact resistance. A competitive squash player needs impact-resistant polycarbonate for protective eyewear. Impact resistance outweighs thinness or economy.

16. A — Titanium or another hypoallergenic material. A history of nickel dermatitis calls for a hypoallergenic material such as titanium. Nickel-containing alloys risk provoking the reaction.

17. C — Simple myopic astigmatism. A plano sphere with a minus cylinder (plano  $-2.00 \times 180$ ) places one focal line on the retina and the other in front, defining simple myopic astigmatism. The plano sphere and single minus cylinder are its signature.

18. C — A sphere only ("dipters sphere"). "DS" means dipters sphere — a spherical lens with no cylinder. The notation confirms no astigmatic correction.

19. B — Anisometropia. A  $+1.00$  right eye and  $+4.00$  left eye is a difference in refractive error between the two eyes, termed anisometropia. It can cause vertical imbalance in down-gaze.

20. A —  $+1.50$  D. The add equals the near reading minus the distance reading:  $+2.50 - (+1.00) = +1.50$  D. The add is the additional near plus power.

21. B — Progressive lens needing depth for its zones. The B (vertical) measurement matters most for a progressive, which needs depth to fit its distance, intermediate, and near zones. A shallow frame cuts off the near area.

22. A — Myopia of about  $-2.00$  D. A far point at  $0.50$  m with clear near vision indicates myopia, with power the reciprocal of the far point:  $1 \div 0.50 = 2.00$ , so  $-2.00$  D. This is the defining presentation of nearsightedness.

23. D — High-index material in a smaller frame. For a  $-6.50$  DS lens, cosmetic thinness is best achieved with high-index material in a smaller, well-centered frame. A large frame and flat curves keep edges thick.

24. D — A spherical lens. A lens reading one power in all meridians with no cylinder axis is purely spherical. A spherocylindrical lens would show two powers and an axis.

25. A — An electronic video magnifier. A patient with macular degeneration who struggles to read is helped by an electronic video (CCTV) magnifier that enlarges and enhances contrast. Routine coatings and standard lenses are not low vision aids.

26. C — 69 mm. Frame PD equals eye size plus DBL:  $50 + 19 = 69$  mm. This is compared to the patient PD to find decentration.

27. B — 3.5 mm inward. Total decentration is frame PD minus patient PD:  $69 - 62 = 7$  mm; per lens =  $7 \div 2 = 3.5$  mm inward. The centers move nasally because the PD is narrower than the frame PD.

28. D — More peripheral color fringing. A low Abbe value ( $\sim 30$ ) means more dispersion and therefore more peripheral chromatic aberration (color fringing). This is the optical trade-off for polycarbonate's safety advantages.

29. B —  $-2.50$  D. Spherical equivalent equals sphere plus half the cylinder:  $-1.00 + (\frac{1}{2} \times -3.00) = -1.00 + (-1.50) = -2.50$  D. Carrying the cylinder's sign through is essential.

30. A — Glaucoma. Halos, gradual peripheral field loss, and elevated IOP form the classic pattern of glaucoma. Its symptom-free early progression is why screening matters.

31. D — Bridge size, 18. The frame PD is found by adding the eye size to the bridge size (DBL), here 18, so the bridge number is used with the eye size. The temple length is not used in this calculation.

32. B — Significant plus help for near tasks. An add of  $+2.50$  indicates the patient needs substantial plus power for near work, consistent with advanced presbyopia. The add is always a plus value supplementing distance.

33. A — There is no cylinder, so axis does not apply. A cylinder of  $+0.00$  with a blank axis confirms a purely spherical lens, for which axis is meaningless. Axis only applies when a cylinder is present.

34. A — A polarized lens. A patient bothered by surface glare off open water is best served by a polarized lens, which blocks horizontally reflected glare. A tint or AR alone would not address it as effectively.

35. D — High enough for vertex distance to change effective power. At  $-8.00$  DS, the power is high enough that moving from spectacle plane to the eye changes the effective power, requiring vertex compensation. Low powers are not meaningfully affected.

36. A — Fine bridge-fit adjustment after dispensing. Adjustable nose pads allow the bridge fit to be fine-tuned after dispensing. A fixed or molded plastic bridge does not offer this.

37. B — Tight; the near zone may be cramped. A seg height of 18 mm in a frame with only a 22 mm B measurement leaves just 4 mm below the seg, cramping the near zone. Adequate depth below the seg is needed for usable near vision.

38. B — The back surface. Back vertex power is read with the lens's back surface against the lensmeter stop, since spectacle power is specified at the surface nearest the eye. Reversing it introduces error in higher powers.

39. A — Equal in prescription (isometric). Both eyes reading +3.00 -1.00 x 180 are identical, so the prescription is equal (isometric) between the eyes. There is no anisometropia.

40. D — Larger eye size and narrower bridge. "58 □ 14" has a larger eye size (58 vs. 50) and a narrower bridge (14 vs. 18) than "50 □ 18." Both happen to give the same 72 mm frame PD, but the dimensions differ.

41. B — Progressive blur, glare, and dimming. A cataract, the clouding of the crystalline lens, causes progressive blur, glare, and dimming of vision. It is treated surgically with an intraocular lens implant.

42. C — -6.00 D. The axis is 090, so the cylinder has zero power there and full power 90° away: -4.00 + (-2.00) = -6.00 D in the horizontal (180) meridian. This is the two-meridian behavior.

43. D — Polycarbonate or Trivex. A rimless drill-mount lens is stressed at the holes, so impact-resistant polycarbonate or Trivex prevents cracking. Glass and brittle materials are inappropriate.

44. B — A photochromic lens. A lens that darkens outdoors and clears indoors automatically is a photochromic lens. This light-adaptive behavior is its defining feature.

45. B — Calibrated for one specific index. A lens clock is calibrated to one assumed index, so on a 1.74 high-index lens it measures curvature faithfully but the power reading needs caution. The curvature itself is read accurately.

46. A — Vertical imbalance below the OCs. With anisometropia, strain only in down-gaze reading reflects vertical imbalance as the eyes drop below the optical centers. In primary gaze through the OCs no imbalance occurs.

47. A — 68 mm. Frame PD equals eye size plus DBL:  $52 + 16 = 68$  mm. The temple length (140) is not part of this calculation.

48. D — 4 mm inward. Total decentration is frame PD minus patient PD:  $68 - 60 = 8$  mm; per lens =  $8 \div 2 = 4$  mm inward. The centers move nasally because the PD is narrower than the frame PD.

49. A — A given axis error causes more blur with a strong cylinder. ANSI Z80 tightens axis tolerance as cylinder power increases because the same axis deviation produces more visual blur with a stronger cylinder. A  $3^\circ$  error on a  $-2.75$  cylinder is therefore significant.

50. B — Warn that they are not occupationally rated. The duty to warn requires telling the welder that ordinary dress lenses are not rated for occupational hazards like arc welding. Dispensing them silently would be a safety and liability failure.

51. C — Hyperopic in both eyes. Two equal plus distance powers ( $+2.50$  DS each) indicate hyperopia in both eyes. The equal values also mean the eyes are isometric.

52. C — Darker at the top, lighter at the bottom. A gradient tint described as 80% top to 10% bottom is darker at the top and lighter at the bottom. This distinguishes it from a uniform solid tint.

53. D — The distance reading is subtracted as a positive number — here zero. The add equals near minus distance; with the distance plano (0.00), the near reading  $+2.25$  equals the add. Subtracting zero leaves the near reading as the add value.

54. A — An anti-reflective coating. Night-driving headlight glare is best reduced by an anti-reflective coating, which cuts surface reflections and improves clarity. A dark or mirrored lens would reduce useful light at night.

55. D — Beveled to seat in the frame groove. A full-rim frame requires a standard bevel cut into the lens edge to seat in the frame's groove. Drilled holes and grooves belong to rimless and semi-rimless mountings.

56. A — Encourage medical follow-up for blood-sugar-related shifts. Week-to-week vision fluctuation in a diabetic reflects blood-sugar-related refractive shifts, a reason to encourage medical follow-up. It should not be treated as a permanent change.

57. D — Warmed with a frame heater before bending. A zyl (acetate) frame must be warmed before bending because cold plastic is brittle and can crack. Metal frames, by contrast, are adjusted cold.

58. D — A purely spherical lens. A lens reading sphere power only, with no cylinder or axis, is purely spherical. A spherocylindrical lens would show a second power and an axis.

59. C — An executive-style bifocal. A drafting technician needing the widest sustained near field is best served by an executive bifocal with its full-width segment. Round segments and shallow progressives offer narrower zones.

60. C —  $-4.50$  D. Transposition combines sphere and cylinder:  $-3.00 + (-1.50) = -4.50$  D as the new sphere. This is the first transposition step before flipping the cylinder sign and rotating the axis.

61. A — 090. Transposition rotates the axis  $90^\circ$ : from 180, subtract 90 to get 090. The new plus-cylinder form is  $-4.50 +1.50 \times 090$ .

62. B — It changes the effective power at the eye. At  $+9.00$  DS, the 14 mm vertex distance is recorded because it changes the lens's effective power at the eye, requiring compensation. High powers are sensitive to vertex changes.

63. C — A plus reading add with no distance correction. An emmetropic presbyope needs only a plus reading add, since distance requires no correction. This is why simple reading glasses suit emmetropic presbyopes.

64. C — Grooved to seat the cord. A semi-rimless nylon-cord mounting requires a groove cut in the lens edge to seat the cord. Each mounting type dictates its own edge treatment.

65. A — Optical center, with no prism. A centered, undisplaced lensmeter target at the lens center indicates reading through the optical center, where no prism is present. Displacement would indicate prism.

66. B — 100%, fully. With the cylinder axis at 090, the meridian 90° away (180) carries the full cylinder power. Cylinder effect grows from 0% at the axis to 100% at 90°.

67. D — An aspheric lens. An aspheric lens is flatter and reduces magnification, making a strong-plus wearer's eyes appear less enlarged. Steeper curves, larger blanks, and thicker centers worsen the effect.

68. B — Vertex distance (lens to cornea). A distometer reading of 13 mm is the vertex distance — the gap from the back of the lens to the cornea. It is used for vertex compensation in higher powers.

69. C — Below the optical center, inducing prism. A +5.00 lens that slips 4 mm down the nose sits lower on the face, so the patient's line of sight passes below the optical center, inducing unwanted prism by Prentice's rule. Off-center viewing through a strong lens induces prism.

70. D — Well suited, pads can be repositioned. A metal frame with adjustable nose pads is well suited to a patient wanting maximum after-dispensing bridge adjustment, since the pads can be repositioned. Fixed and molded bridges do not allow this.

71. B — Apex (temporally). A prism displaces the perceived image toward its apex; base-in prism in the right lens has its base nasal and apex temporal, so the image shifts temporally. Image-toward-apex is the rule.

72. C — Reduced vision not fully correctable by lenses alone. Amblyopia ("lazy eye") is reduced vision in an eye that did not develop normally and cannot be fully corrected by lens power alone. It differs from a clouded lens or a blind spot.

73. C — Impact resistance for drilled lenses. Trivex is appropriate for a rimless drill mount chiefly for its impact resistance, which prevents cracking at the holes. Its index is moderate and its weight low.

74. A —  $70 - 66 = 4$  mm. Frame PD = eye size + DBL =  $55 + 15 = 70$  mm; total decentration = frame PD – patient PD =  $70 - 66 = 4$  mm.

75. A — Within the allowed deviation for its value. "Passes all ANSI Z80 tolerances" means each parameter falls within its allowed deviation, not that it matches every number exactly. "Within tolerance" is the practical standard.

76. A — Polycarbonate for impact resistance. An active 7-year-old's everyday glasses should use impact-resistant polycarbonate for safety. Impact resistance outweighs thinness, clarity, or economy for children.

77. D — +2.00 D. The axis is 180, so the cylinder has zero power there and full power  $90^\circ$  away:  $+1.00 + (+1.00) = +2.00$  D in the 090 meridian. This is the two-meridian behavior.

78. D — Choose a smaller, well-centered frame. For a  $-10.00$  DS lens with thick edges, the most effective step beyond high index is a smaller, well-centered frame. A large frame or wide bridge keeps edges thick.

79. C — Windshields block most activating UV. Photochromics darken in response to UV, which a windshield largely blocks, so they darken less in the car. This is a key limitation to disclose.

80. B — Facial asymmetry between the two sides. Monocular PDs of OD 32 / OS 30 reflect facial asymmetry, which monocular measurement accommodates so each OC aligns with its pupil. A single binocular PD could misplace the centers.

81. A — An intermediate zone (trifocal or progressive). A +1.50 add with an intermediate complaint at the computer indicates a need for an intermediate zone, supplied by a trifocal or progressive. A stronger distance or tint does not address it.

82. A — Contains a vertical prism component. A readout of  $2.0\Delta$  base down means the lens carries a vertical prism component, whether prescribed or induced. A prism-free lens would read zero.

83. D — UV protection is a separate property to confirm. UV protection must be confirmed as a specific lens property, not assumed from tint darkness. A dark non-UV lens can be worse than no sunglasses.

84. A — Distance between lenses (bridge). "DBL" stands for distance between lenses — the bridge size. It is added to the eye size to find frame PD.

85. B — 0.00 D. Spherical equivalent equals sphere plus half the cylinder:  $+2.00 + (\frac{1}{2} \times -4.00) = +2.00 + (-2.00) = 0.00$  D. Carrying the cylinder's sign through is essential.

86. C — PD and optical-center placement. Headaches with correctly verified power suggest a centration error, so the optician first checks PD and OC placement, which can induce prism. Centration is verified before blaming the prescription.

87. C — The near reading minus the distance reading. The add power equals the near zone reading minus the distance zone reading, since the add is the additional near plus power. It is obtained by difference.

88. D — Base curve from the previous pair. A "swim" sensation with correctly verified power often signals a base-curve change from the patient's prior lenses. Matching the previous base curve helps a remake feel familiar.

89. A — Lowered relative to the pupil. As pantoscopic tilt increases (here to  $12^\circ$ ), the optical center is lowered (roughly 1 mm per  $2^\circ$  of tilt) to keep the line of sight near the OC. Tilt and OC height are linked.

90. C — Lower eyelid margin. For most flat-top bifocal fits, the segment top is set at the lower eyelid margin so the patient sees over it for distance and into it for near. Setting it too high or low compromises vision.

91. B — An automatic lensmeter. An instrument displaying sphere, cylinder, and axis electronically is an automatic lensmeter. It reads the same back vertex parameters as a manual one but reduces operator variability.

92. B — Optically compensated for the wrap. A  $-4.00$  DS in a high-wrap sport frame requires lenses optically compensated for the wrap to avoid peripheral distortion. Thickness changes and blank size do not address the wrap optics.

93. D — The reading area sits too low to reach comfortably. A progressive fitting cross placed below the pupil center pushes the reading area too low, making it hard to reach comfortably. Correct placement is at the pupil center.

94. B — Adequate vertical depth for its zones. A 20 mm B measurement is a concern because a progressive needs adequate vertical depth to fit its distance, intermediate, and near zones. A too-shallow frame cuts off the near area.

95. D — Less effective plus power than intended. Increasing the vertex distance on a  $+6.00$  lens reduces its effective power at the eye, so the patient receives less plus than intended. This is why vertex matters in strong plus prescriptions.

96. C — A slab-off on one lens. Significant vertical imbalance from anisometropia (OD  $+1.00$  / OS  $+3.50$ ) is commonly corrected with a slab-off, which adds prism in the reading portion of one lens. This neutralizes the down-gaze imbalance.

97. D — Reflect more light at their surfaces. AR was applied to the 1.67 high-index lens because higher-index materials reflect more light at their surfaces. The coating recovers transmission and reduces glare.

98. C — Lower the segment to the lower-lid level. A segment set too high, intruding on distance vision, is corrected by lowering it to the lower-lid level. Increasing the add or enlarging the frame does not fix the seg height.

99. C — How the frame reaches and curves over the ears. The temple length (150 mm) governs how the temple reaches and curves over the ears for a secure fit. It does not set OC placement, frame PD, or base curve.

100. A — A purely spherical lens. A lens reading  $-3.00$  sphere in all meridians with no cylinder is purely spherical. A spherocylindrical lens would show a second power and an axis.

101. B — Reduces edge thickness. A smaller, well-centered frame reduces edge thickness for a strong minus prescription. A large frame or wide bridge keeps edges thick.

102. C — Zero, since both eyes view through their OCs. Looking straight ahead through both optical centers, no prism is induced, so the vertical imbalance is zero in primary gaze. Imbalance appears only in down-gaze below the OCs.

103. B — Impact resistance and durability. Calipers confirming a 2.2 mm center thickness verify the lens meets minimum thickness for impact resistance and durability. Adequate thickness is part of the safety requirement.

104. D — Entitled to a copy of their own prescription. A patient is generally entitled to a copy of their own prescription. Withholding it or limiting them to a verbal summary is improper.

105. C — HIPAA privacy and security rules. An EMR storing a prescription and identifiers must comply with HIPAA's privacy and security rules. ANSI, FDA, and EPA standards govern products and the environment instead.

106. B — Wider bridge (DBL). "50 □ 20" has a wider bridge (20 vs. 16) than "54 □ 16"; its eye size is smaller and both share the same temple. The DBL is the differing dimension highlighted.

107. B — The ANSI Z80 axis tolerance for that cylinder power. A  $2^\circ$  axis deviation on a  $-0.50$  cylinder should be evaluated against the ANSI Z80 axis tolerance, which a weak cylinder may permit. The lens passes if it falls within the limit.

108. A — ANSI Z87. Protective eyewear for arc welding must meet the ANSI Z87 occupational safety standard. ANSI Z80 covers dress lenses, not safety eyewear.

109. B — ASTM. Sports goggles for basketball are most directly governed by ASTM standards, distinct from ANSI Z87 (occupational) and Z80 (dress). Matching the standard to the use is the testable skill.

110. C — EPA. Disposal of spent edging coolant (chemical lab waste) is governed by the EPA. HIPAA, the FDA, and ANSI address privacy and products instead.

111. D — Impact resistant for everyday wear. Dress lenses meeting the FDA impact rule are impact resistant for everyday wear, but not rated for occupational hazards or sports. The FDA rule applies to general dress eyewear.

112. C — Is not rated as occupational safety eyewear. A patient using fashion sunglasses for a hazardous task must be warned that the eyewear is not rated as occupational safety eyewear. This is a core duty-to-warn obligation.

113. B — Ophthalmic product tolerances. The ANSI Z80 series sets standards for ophthalmic product tolerances, against which lenses are verified. It does not govern pathogens, privacy, or waste.

114. A — As HIPAA permits or with patient consent. A third party's request for a patient's full record may be honored only as permitted under HIPAA or with the patient's consent. Arbitrary or public disclosure violates privacy rules.

115. A — UV protection is a separate property to confirm. A dark tint does not guarantee UV protection; UV blocking is a separate property that must be confirmed. A dark non-UV lens can be worse than no sunglasses.

116. C — Recommend ASTM-rated sports eyewear and warn of the limitation. Dress lenses are not sport-rated, so the optician recommends ASTM-rated sports eyewear and warns of the limitation. A tint or readers do not provide protection.

117. B — The FDA sets the dress-lens impact rule and OSHA governs workplace safety. The FDA requires dress lenses to be impact resistant, while OSHA governs employee workplace safety — distinct roles. Confusing the two is a common error.

118. D — Limited to what HIPAA permits or the patient consents to. Release of a patient's prescription to others is limited to what HIPAA permits or the patient consents to. Convenient or public disclosure violates the rules.

119. A — Safeguarded and released only as permitted. Protected health information — the patient's Rx and identifiers — must be safeguarded under HIPAA and released only as permitted or with consent. It is not public or workplace-safety data.

120. D — Limited to what HIPAA permits or the patient consents to. A patient is owed their own prescription, but third-party disclosure is limited to what HIPAA permits or the patient consents to. Convenient or public disclosure violates the rules.

121. C — 70 mm. Frame PD equals eye size plus DBL:  $52 + 18 = 70$  mm. The patient PD (66) is compared to this to find decentration.

122. A — 2 mm inward. Total decentration is frame PD minus patient PD:  $70 - 66 = 4$  mm; per lens =  $4 \div 2 = 2$  mm inward. The centers move nasally because the PD is narrower than the frame PD.

123. C — +2.00 D. The axis is 090, so the cylinder has zero power there and only the +2.00 sphere acts in the vertical (090) meridian. The full cylinder acts  $90^\circ$  away.

124. A — Keep the cornea smooth, clear, and nourished. A healthy tear film keeps the cornea smooth and optically clear, supplies oxygen and nutrients, and maintains comfort. Poor tear film produces dry, gritty eyes and blur.

125. D — Falls within the allowed deviation for its value. Under ANSI Z80, "within tolerance" means each parameter falls within its allowed deviation, not that it matches every number exactly. This is the practical standard of acceptance.