PRACTICE EXAM 11

1. A patient's minus lenses have very thick edges. The underlying cause is that:

A. Minus power moves thickness from the center to the edges

B. The anti-reflective coating adds bulk at the rim

C. The lens index was raised too far

D. The frame bridge is too narrow

2. A patient sees color fringes at the periphery of their new lenses. The most likely cause is a material with a:

A. High index and high Abbe value

B. Thick center

C. Low Abbe value

D. Heavy scratch coating

3. A +5.00 lens delivers 2.5Δ when the patient views 5 mm off-center. The prism arises because:

A. Off-center viewing through a powered lens induces prism by Prentice's rule

B. The coating bends the light

C. The frame is the wrong color

D. The tint absorbs light unevenly

4. A patient's high-plus lenses make their eyes look enlarged to others. This occurs because:

A. The minus power minifies the image

B. The Abbe value is too high

C. Plus lenses magnify the image

D. The base curve is too flat

5. A myope's uncorrected distance vision is blurry while near is clear. This happens because:

A. Light focuses in front of the retina

B. Light focuses behind the retina

C. The cornea has unequal curvature

D. Accommodation has been lost

6. A patient's two eyes show unequal vertical prism only when reading. The cause is:

A. Anisometropia producing imbalance below the OCs

B. A scratched lens coating

C. An incorrect frame color

D. A defective tint

7. A high-index lens reflects noticeably more light than the patient's old CR-39 pair. This is because:

A. The coating was omitted on the old pair

B. High-index lenses are always tinted

C. Higher index increases surface reflection

D. The new lenses are thicker

8. A patient's reading add must be added to their distance power for near tasks because:

A. The add replaces the distance power

B. The add cancels the cylinder

C. The add is extra plus layered on the distance correction

D. The add corrects astigmatism

9. An emmetropic 48-year-old now needs reading glasses. The cause is:

A. Sudden onset myopia

B. A clouding of the lens

C. Elevated eye pressure

D. Age-related loss of accommodation

10. A patient's far point sits at 0.25 m uncorrected. This indicates a refractive error of:

A. +4.00 D hyperopia

B. +0.25 D hyperopia

C. –0.25 D myopia

D. –4.00 D myopia

11. A lens reading one power in every meridian shows no axis because:

A. It is a spherical lens with no cylinder

B. The cylinder is hidden by the coating

C. The lensmeter is broken

D. The prism cancels the cylinder

12. Raising a lens's index reduces its thickness because the higher index:

A. Lowers the lens weight by adding material

B. Increases the Abbe value

C. Bends light more strongly, needing less material

D. Eliminates surface reflection

13. A cylinder exerts no power at its axis meridian because:

A. The axis carries the full cylinder power

B. Cylinder power acts perpendicular to the axis, peaking 90° away

C. The sphere cancels it there

D. The prism offsets it

14. A patient's spherical equivalent for –2.00 –2.00 x 180 is –3.00 D because the SE equals:

A. The sphere plus the full cylinder

B. The sphere plus half the cylinder

C. Twice the cylinder

D. The cylinder alone

15. A prism displaces the perceived image toward its apex because:

A. Light bends toward the apex

B. The base absorbs the image

C. The coating redirects light

D. Light bends toward the base, shifting the image toward the apex

16. A patient's new glasses with verified-correct power still cause eyestrain. The most likely cause is:

A. A centration error inducing unwanted prism

B. A defective scratch coat

C. An incorrect tint density

D. An expired warranty

17. A contact lens needs less minus power than the spectacle it replaces because the contact:

A. Sits farther from the eye

B. Corrects astigmatism differently

C. Has a higher Abbe value

D. Sits closer to the eye, changing effective power

18. A patient's photochromic lenses barely darken in the car because:

A. They respond only to infrared heat

B. Windshields block most activating UV

C. They are defective

D. They darken only in cold

19. A patient's frame keeps sliding down the nose. The cause lies in the fitting triangle's:

A. Lens anti-reflective coating

B. Lens base curve only

C. Bridge/nose-pad fit and temples

D. Lens material index

20. A patient's lenses make the floor seem to "swim," though power verifies correct. The cause is most likely:

A. An incorrect tint

B. A wrong coating brand

C. A base-curve change from the previous pair

D. An expired prescription

21. A first-time progressive wearer reports mild side blur but clear central vision. This occurs because:

A. Progressive designs have soft peripheral zones requiring adaptation

B. The power is definitely wrong

C. The coating is defective

D. The frame material is incorrect

22. A patient looking 1 cm below the OC of a +3.00 lens experiences 3.0Δ. The cause is:

A. Prentice's rule: prism equals decentration in cm times power

B. The lens tint absorbing light

C. The frame sitting crooked

D. A defective coating

23. A patient with rheumatoid arthritis reports chronically dry, gritty eyes. The cause is:

A. Improved tear production

B. Elevated eye pressure

C. A refractive shift

D. Reduced tear quality from the autoimmune condition

24. A patient's strong cylinder needs a tighter axis tolerance because:

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

B. Strong cylinders are easier to grind

C. Weak cylinders need more precision

D. Axis is unrelated to cylinder power

25. A patient's glasses cause double vision despite correct power. The underlying cause is:

A. A defective scratch coat

B. A centration error inducing prism

C. An incorrect tint

D. An expired warranty

26. A patient's eyes look smaller through their minus lenses because:

A. Minus lenses minify the image

B. Plus lenses magnify the image

C. The Abbe value is too low

D. The frame is too large

27. Glaucoma causes peripheral vision loss first because it damages:

A. The central macula

B. The crystalline lens

C. The optic nerve fibers serving the periphery

D. The corneal surface

28. A patient's vision fluctuates week to week since their diabetes diagnosis because:

A. The cornea permanently reshaped

B. The lens clouded suddenly

C. The eye pressure dropped

D. Blood-sugar changes shift the refractive error

29. Macular degeneration impairs reading because it damages the:

A. Peripheral retina

B. Central retina (macula)

C. Optic nerve head

D. Corneal epithelium

30. A patient's accommodation has declined with age, causing near blur. This is because:

A. The cornea flattened

B. The crystalline lens stiffened, reducing focusing ability

C. The pupil enlarged

D. The retina thinned

31. A patient's two retinal images differ in size, disrupting fusion. This condition is caused by:

A. Equal refractive error in both eyes

B. A scratched coating

C. Significant difference between the eyes producing aniseikonia

D. A dark tint

32. Hyperopia blurs uncorrected near vision more than distance because relaxed-eye light focuses:

A. In front of the retina

B. Exactly on the retina

C. Behind the retina, demanding accommodation

D. On the cornea

33. A patient's eyes turn inward only when fusion is broken on cover testing. This indicates:

A. A phoria, a latent deviation controlled by fusion

B. A constant manifest tropia

C. A clouding of the lens

D. A blind spot

34. A cataract dims and blurs vision because it:

A. Elevates eye pressure

B. Clouds the crystalline lens

C. Misaligns the eyes

D. Damages the peripheral retina

35. Cones provide sharp color detail in bright light because they are:

A. Spread evenly across the periphery

B. Highly sensitive to dim light

C. Responsible for tear production

D. Concentrated at the macula and tuned to bright light

36. A patient sees poorly in dim light and at the periphery. The cause involves the function of the:

A. Cornea

B. Crystalline lens

C. Aqueous humor

D. Rods, which serve dim-light and peripheral vision

37. A patient's eyes converge when shifting gaze to a near object because:

A. The eyes rotate outward for near

B. The eyes rotate inward to maintain single near vision

C. The lens clouds at near

D. The pupil dilates for near

38. A patient with thyroid disease shows bulging eyes affecting frame fit. The cause is:

A. A clouding of the lens

B. A loss of central vision

C. Elevated eye pressure

D. Exophthalmos, forward protrusion of the globes

39. A child's everyday lenses must be polycarbonate because the priority is:

A. The thinnest possible profile

B. The highest Abbe value

C. The lowest cost

D. Impact resistance for safety

40. A semi-rimless frame's lens must be grooved because:

A. The lens mounts in a full rim

B. A nylon cord seats in the groove

C. Drilled holes hold the lens

D. The edge is left unfinished

41. A polarized lens cuts glare off water because it blocks:

A. Horizontally polarized reflected light

B. All vertical light

C. Ultraviolet only

D. Infrared heat

42. A patient's dark, non-UV sunglasses are harmful because the darkness:

A. Reflects all light away

B. Permanently fixes the Rx

C. Increases impact resistance

D. Dilates the pupil while UV still reaches the eye

43. A trifocal serves a zone a bifocal lacks because it adds correction for:

A. The smallest near print

B. Intermediate, arm's-length distances

C. Distant road signs

D. Peripheral motion only

44. An anti-reflective coating improves night-driving clarity because it:

A. Darkens the lens against headlights

B. Reduces surface reflections and glare

C. Corrects the prescription

D. Makes the lens scratch-proof

45. OTC readers can cause eyestrain because their:

A. Fixed OC spacing may not match the patient's PD

B. Lenses correct astigmatism

C. Powers differ per eye

D. UV protection is guaranteed

46. A rimless drill-mount frame needs polycarbonate or Trivex because these materials:

A. Are the cheapest available

B. Resist cracking at the drilled holes

C. Have the highest index

D. Cannot be tinted

47. A gradient tint suits driving and cosmetics because it is:

A. Uniform in density

B. Color-changing in sunlight

C. Darker at the top, lighter at the bottom

D. Polarized against vertical glare

48. A patient with a strong plus Rx benefits from an aspheric lens because it:

A. Adds magnification to the eyes

B. Is flatter and reduces the magnified-eye look

C. Increases the center thickness

D. Raises the surface reflection

49. A photochromic lens darkens outdoors because it responds to:

A. Infrared heat

B. The wearer's body temperature

C. Visible blue light only

D. Ultraviolet radiation

50. An executive bifocal gives the widest near field because its segment:

A. Is a small round shape

B. Changes power continuously

C. Spans the full lens width

D. Is absent entirely

51. A patient with a nickel allergy reacts to a plated base-metal frame because:

A. Plating can wear and expose the nickel alloy

B. Titanium contains nickel

C. The plating is the allergen

D. Nickel is hypoallergenic

52. A high-index lens needs an anti-reflective coating because it:

A. Cannot be tinted otherwise

B. Has a high Abbe value

C. Reflects more light than standard plastic

D. Is too thin to coat

53. A patient with macular degeneration is helped by a video magnifier because low vision aids work by:

A. Reversing the disease

B. Magnifying and enhancing contrast

C. Restoring 20/20 acuity

D. Repairing the retina

54. A solid tint differs from a gradient tint because the solid tint is:

A. Darker at the top only

B. Color-changing in sunlight

C. Uniform in density across the lens

D. Polarized against glare

55. A patient's occupational computer lens suits their job because it optimizes:

A. Intermediate and near working distances

B. Distance vision only

C. Peripheral motion detection

D. Night-driving glare

56. Titanium suits an allergy-prone patient because it is:

A. A nickel-rich alloy

B. An untreated base metal

C. Lightweight, strong, and hypoallergenic

D. The heaviest frame material

57. A patient's lenses for arc welding must be occupationally rated because dress lenses:

A. Are automatically welding-safe

B. Block all UV by default

C. Exceed every safety standard

D. Are not rated for occupational hazards

58. A wide near field from an executive bifocal comes at the cost of:

A. No near correction at all

B. A loss of distance vision entirely

C. Added weight and a prominent segment line

D. An inability to be tinted

59. A patient sensitive to chromatic aberration should choose a higher-Abbe material because higher Abbe means:

A. A thinner lens

B. Less dispersion and color fringing

C. More surface reflection

D. Lower impact resistance

60. A photochromic lens may underperform in a car because UV activation is reduced when:

A. The patient stands in direct sun

B. A windshield blocks most UV

C. The altitude is high

D. The day is clear and bright

61. A lensmeter measures back vertex power because spectacle power is specified at the:

A. Surface nearest the eye

B. Front surface

C. Geometric center

D. Beveled edge

62. A lens clock reading on a high-index lens needs caution because the clock:

A. Cannot read curvature at all

B. Measures only PD

C. Reads prism only

D. Is calibrated for one assumed index

63. A distometer is used for high-powered prescriptions because it measures:

A. The lens base curve

B. The vertex distance, which affects effective power

C. The pupillary distance

D. The lens perimeter

64. A corneal reflex pupillometer gives accurate PD because it:

A. Aligns to the light reflex on each cornea

B. Measures vertex distance simultaneously

C. Reads the lens base curve

D. Requires no patient cooperation

65. A lensmeter target stays displaced even at the lens's thickest point because the lens:

A. Has a scratch coating

B. Has an anti-reflective coating

C. Contains prescribed prism

D. Is photochromic

66. A lens clock measures surface curvature, not total power, because it reads:

A. The pupillary distance

B. The vertex distance

C. One surface's curvature at a time

D. The lens perimeter

67. The add power is found by subtracting the distance reading from the near reading because the add is:

A. The distance power itself

B. The cylinder power

C. The prism component

D. The extra plus power added for near

68. A digital measurement system cannot supply the Abbe value because Abbe value is:

A. A position-of-wear measurement

B. A frame dimension

C. A material property, not a position-of-wear value

D. A prism reading

69. A centered lensmeter target indicates the optical center because, at that point:

A. The cylinder peaks

B. No prismatic deviation occurs

C. The prism is maximal

D. The base curve is steepest

70. Calipers are chosen to measure lens thickness because they:

A. Read back vertex power

B. Measure pupillary distance

C. Measure small linear dimensions precisely

D. Read UV transmission

71. An automatic lensmeter reduces operator error because it:

A. Measures only front vertex power

B. Cannot read cylinder

C. Displays readings electronically

D. Needs no lens inserted

72. A plastic (zyl) frame must be warmed before bending because cold plastic:

A. Holds its shape better cold

B. Bends more easily when frozen

C. Resists all adjustment

D. Is brittle and can crack

73. Padded nylon-jaw pliers are chosen for adjustment because they:

A. Apply greater bending force

B. Protect the frame finish from marring

C. Heat the frame faster

D. Measure the frame dimensions

74. A circumference (lens) gauge is used in edging because it measures the lens's:

A. Size or perimeter

B. Back vertex power

C. Surface curvature

D. Center thickness

75. A monocular PD is preferred for an asymmetric face because it:

A. Is faster than a binocular PD

B. Measures vertex distance too

C. Needs no instrument

D. Aligns each OC with its own pupil

76. Metal frames are adjusted cold, unlike plastic, because metal:

A. Becomes brittle when warmed

B. Cannot be reshaped at all

C. Must be frozen first

D. Does not require heat to bend safely

77. Round-nose pliers form curves in metal frame parts because their jaws are:

A. Flat for gripping cord

B. Padded for finish protection

C. Rounded to shape bends

D. Sharp for cutting

78. A lens reading sphere power only, with no cylinder, is spherical because:

A. It has two principal powers

B. It has one power in all meridians

C. It contains only prism

D. It is a bifocal

79. A distometer reading matters at +9.00 D because vertex distance:

A. Has no effect at high power

B. Only affects minus lenses

C. Changes the effective power at the eye

D. Only matters below 1.00 D

80. Pad-adjusting pliers are used on metal frames to:

A. Cut the temple wire

B. Read the base curve

C. Measure seg height

D. Angle and position the nose pads

81. Correct optical-center placement prevents eyestrain because it:

A. Darkens the lens automatically

B. Raises the Abbe value

C. Avoids inducing unwanted prism in primary gaze

D. Increases scratch resistance

82. A bifocal segment set too high intrudes on distance vision because it:

A. Sits below the lower lid correctly

B. Rises into the distance viewing zone

C. Is within tolerance

D. Sits too low on the lens

83. A progressive needs adequate frame depth because its zones require:

A. A wider bridge

B. Sufficient vertical (B) space for distance, intermediate, and near

C. A longer temple

D. A flatter base curve

84. A first-time progressive wearer's adaptation period exists because the design has:

A. Soft peripheral zones the brain must learn to ignore

B. A definite power error

C. A coating defect

D. A wrong frame material

85. A patient's strong minus Rx has thinner edges in a smaller frame because:

A. The index was raised

B. The bridge widened

C. The base curve steepened

D. Less lens material extends beyond the optical center

86. A patient's frame sits too far from the eyes, weakening a plus Rx, because the increased vertex distance:

A. Reduces the effective plus power at the eye

B. Adds minus power

C. Has no effect

D. Raises the Abbe value

87. Anisometropia causes vertical imbalance only in down-gaze because:

A. The eyes drop below the OCs by different amounts when reading

B. The eyes view through the OCs straight ahead

C. The frame is level

D. Both eyes are closed

88. A slab-off corrects reading-level vertical imbalance because it:

A. Enlarges the frame

B. Adds a heavier coating

C. Steepens the base curve

D. Adds prism in the reading portion of one lens

89. Pantoscopic tilt requires lowering the OC because, as the lens tilts:

A. The OC must rise

B. The line of sight passes lower on the lens

C. The frame curves horizontally

D. The temple lengthens

90. A flat-top seg is set at the lower-lid level because that placement:

A. Blocks distance vision

B. Forces excessive head tilt

C. Eliminates the near zone

D. Lets the patient see far above it and near through it

91. A high-wrap frame distorts a strong Rx unless compensated because the wrap:

A. Thins the lens

B. Removes the coating

C. Shrinks the blank

D. Changes the angle light enters the lens peripherally

92. Verifying lenses against the Rx is the first troubleshooting step because:

A. It confirms whether the lab made the lenses correctly

B. It darkens the lens

C. It changes the frame

D. It raises the Abbe value

93. A patient's blurry arm's-length vision with clear far and near indicates a missing:

A. Distance correction

B. Near add

C. Darker tint

D. Intermediate zone

94. A lifestyle assessment changes the lens recommendation because:

A. Only frame color depends on it

B. The Rx alone dictates everything

C. Working distances and tasks determine the best design

D. Activities are irrelevant to lenses

95. A patient's objects appear tilted though power verifies correct because:

A. The lens index is too high

B. The tint is too dark

C. The coating brand is wrong

D. The frame is not sitting level

96. A larger frame worsens edge thickness for a minus Rx because:

A. The index drops

B. The coating thickens

C. More lens extends beyond the optical center

D. The bridge narrows

97. A patient does extensive night driving and benefits from AR coating because it:

A. Reduces glare and reflections from oncoming lights

B. Darkens the lens at night

C. Mirrors the lens surface

D. Shrinks the frame

98. Monocular PDs improve accuracy because they measure:

A. Both eyes together from one point

B. Each eye separately from the bridge center

C. The vertex distance

D. The base curve

99. A patient's bifocal blocks distance vision because the seg was placed:

A. At the lower-lid level

B. Within tolerance

C. Too low on the lens

D. Too high relative to the lower lid

100. A patient's progressive reading area is hard to reach because the fitting cross was set:

A. At the pupil center

B. Too low relative to the pupil

C. Within tolerance

D. At the top frame edge

101. A finished lens passes ANSI Z80 when each parameter is:

A. Within the allowed tolerance for its value

B. Exactly equal to every number

C. Within any deviation the optician prefers

D. Checked on sphere only

102. Dress eyeglass lenses must be impact resistant because of a requirement set by the:

A. EPA

B. FDA

C. HIPAA

D. OSHA

103. A patient's prescription and identifiers are protected because they fall under:

A. HIPAA's protected health information

B. The ANSI Z80 tolerance rule

C. The FDA drop-ball test

D. The EPA waste rule

104. Occupational safety eyewear for a machine shop must meet ANSI Z87 because that standard governs:

A. Workplace and educational eye protection

B. Dress lens tolerances

C. Patient privacy

D. Chemical waste disposal

105. An optician must warn that ordinary glasses are unsafe for welding because the duty to warn requires:

A. Silent dispensing

B. Informing the patient of the eyewear's limitations

C. Adding a fashion tint

D. Substituting readers

106. Disposal of an optical lab's chemical waste is governed by the EPA because the EPA regulates:

A. Patient privacy

B. Environmental and hazardous waste

C. Lens impact testing

D. Product tolerances

107. The ANSI Z80 series exists to standardize:

A. Workplace pathogen handling

B. Patient record privacy

C. Environmental waste

D. Ophthalmic product tolerances

108. A patient is entitled to a copy of their own prescription because:

A. Only a third party may hold it

B. Patients generally have a right to their own records

C. It is the optician's property

D. A verbal summary is the legal limit

109. A weak cylinder tolerates a larger axis error than a strong one because:

A. Axis error produces less blur with a weak cylinder

B. Weak cylinders are harder to grind

C. Axis is unrelated to power

D. Strong cylinders are more forgiving

110. Fashion sunglasses for a hazardous task must carry a warning because they:

A. Meet every occupational standard

B. Permanently correct the Rx

C. Increase impact protection

D. Are not rated as occupational safety eyewear

111. ASTM standards apply to sports goggles, distinct from ANSI Z87, because ASTM governs:

A. Dress lens tolerances

B. Patient privacy

C. Sports and recreational protective eyewear

D. Waste disposal

112. A third party may receive a patient's record only with limits because HIPAA:

A. Bars all record release

B. Allows unrestricted release

C. Requires public posting

D. Permits release only as allowed or with patient consent

113. A dark tint does not guarantee UV protection because UV blocking is:

A. A separate property that must be confirmed

B. Guaranteed by darkness alone

C. Impossible in any tint

D. Only present in mirrored lenses

114. The duty to warn protects patients by:

A. Informing them of a product's limitations and proper use

B. Raising the Abbe value

C. Reducing edge thickness

D. Removing the need for standards

115. An EMR holding patient prescriptions must be secured because it is subject to:

A. The ANSI Z80 standard

B. HIPAA privacy and security rules

C. The FDA drop-ball test

D. The EPA waste rule

116. The FDA and OSHA have distinct eyewear roles because:

A. The FDA governs only workplace safety

B. OSHA sets the dress-lens drop-ball rule

C. Both regulate only privacy

D. The FDA sets the dress-lens impact rule; OSHA governs workplace safety

117. A patient's dress glasses are unsuitable for racquetball because they:

A. Are ASTM sports-certified already

B. Lack the ASTM sports-protection rating

C. Block all impact by default

D. Correct the Rx permanently

118. "Within tolerance" under ANSI Z80 means a finished lens:

A. Matches every number exactly

B. Deviates by any amount allowed

C. Falls within the permitted deviation for each parameter

D. Is checked on sphere only

119. Protected health information must be safeguarded because HIPAA aims to:

A. Standardize lens tolerances

B. Test lens impact

C. Protect patient privacy and security

D. Regulate chemical waste

120. A patient owed their own Rx still faces limits on third-party disclosure because release is:

A. Permitted only as HIPAA allows or with consent

B. Allowed whenever convenient

C. Done by public posting

D. Unrestricted in all cases

121. A welding patient given dress lenses without warning exposes the optician to liability because the optician failed the:

A. ANSI Z80 tolerance rule

B. EPA disposal rule

C. Duty to warn

D. FDA impact test

122. ANSI Z87 imposes stricter requirements than ANSI Z80 because Z87 covers:

A. Dress prescription lenses

B. Patient privacy

C. Occupational and educational safety eyewear

D. Environmental waste

123. A patient's electronic record is governed by HIPAA, not paper rules alone, because HIPAA:

A. Applies only to paper records

B. Governs lens impact testing

C. Exempts electronic records

D. Covers electronic and paper records alike

124. The cornea contributes most of the eye's focusing power because it:

A. Has the greatest refracting surface at the air interface

B. Drains the tears

C. Controls the pupil

D. Maintains eye pressure

125. A patient's poor tear film causes blur and grittiness because the tear film normally:

A. Controls pupil size

B. Keeps the cornea smooth, clear, and nourished

C. Focuses light onto the retina

D. Drains aqueous humor

Answer Key & Full Explanations

1. A — Minus power moves thickness from the center to the edges. A minus lens is thin at the center and thick at the edges, and edge thickness grows with stronger minus power. This is why strong myopes benefit from smaller frames and higher index.

2. C — Low Abbe value. A low Abbe value means high dispersion, producing chromatic aberration and peripheral color fringing. High-index materials, which often have low Abbe values, are most prone to this.

3. A — Off-center viewing through a powered lens induces prism by Prentice's rule. Viewing away from the optical center of a powered lens induces prism equal to decentration (cm) times power: $0.5 \times 5.00 = 2.5\Delta$. Coatings, frame color, and tint do not induce prism.

4. C — Plus lenses magnify the image. A plus lens magnifies, making the wearer's eyes appear enlarged, with the effect growing in higher plus powers. Aspheric designs and reduced vertex distance help minimize this.

5. A — Light focuses in front of the retina. In myopia the eye is too powerful or long, so light focuses in front of the retina, blurring distance vision while near remains clear. A minus lens moves the focus back onto the retina.

6. A — Anisometropia producing imbalance below the OCs. Unequal refractive error between the eyes induces unequal vertical prism when the eyes drop below the optical centers to read, causing the reading-specific symptom. In primary gaze through the OCs no imbalance occurs.

7. C — Higher index increases surface reflection. Higher-index materials reflect more light at their surfaces than CR-39, which is why they noticeably reflect more without an AR coating. The coating recovers the lost transmission.

8. C — The add is extra plus layered on the distance correction. The reading add is additional plus power supplementing the distance prescription for near work. It is combined with, not substituted for, the distance power.

9. D — Age-related loss of accommodation. An emmetropic 48-year-old needing readers has presbyopia, the age-related stiffening of the crystalline lens that impairs near focus. It is corrected with a plus add.

10. D — –4.00 D myopia. The far point of an uncorrected myope is the reciprocal of the power: 1 ÷ 0.25 = 4.00, so –4.00 D. A near far point indicates significant myopia.

11. A — It is a spherical lens with no cylinder. A lens reading one power in all meridians with no axis is purely spherical. A spherocylindrical lens would show a second power and an axis.

12. C — Bends light more strongly, needing less material. A higher index bends light more strongly, so less lens thickness achieves the same power. This is the cosmetic advantage of high-index materials.

13. B — Cylinder power acts perpendicular to the axis, peaking 90° away. A cylinder has zero power along its axis and full power in the meridian 90° away. This is why the axis marks the meridian of no cylinder effect.

14. B — The sphere plus half the cylinder. Spherical equivalent equals sphere plus half the cylinder: –2.00 + (½ × –2.00) = –3.00 D. It represents the single sphere power midway between the two focal lines.

15. D — Light bends toward the base, shifting the image toward the apex. A prism bends light toward its base, so the perceived image displaces toward the apex (thin edge). This image-toward-apex behavior is how prism repositions images.

16. A — A centration error inducing unwanted prism. Eyestrain with correctly verified power most likely reflects a centration error inducing unwanted prism. Coatings, tints, and warranties do not cause eyestrain.

17. D — Sits closer to the eye, changing effective power. A contact lens sits at essentially zero vertex distance, closer than spectacles, making a minus lens effectively weaker so less minus is needed. This vertex effect is significant in high prescriptions.

18. B — Windshields block most activating UV. Most 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.

19. C — Bridge/nose-pad fit and temples. A frame that slides down points to the fitting triangle's support points — the bridge/nose pads and temples. Restoring even three-point support resolves the slipping.

20. C — A base-curve change 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.

21. A — Progressive designs have soft peripheral zones requiring adaptation. Progressive lenses have soft, slightly blurred peripheral zones that the brain learns to ignore, so mild initial side blur is normal adaptation. Recognizing this prevents an unnecessary remake.

22. A — Prentice's rule: prism equals decentration in cm times power. Viewing 1 cm below the OC of a +3.00 lens induces $1.0 \times 3.00 = 3.0\Delta$ by Prentice's rule. The decentration must be in centimeters.

23. D — Reduced tear quality from the autoimmune condition. Autoimmune conditions like rheumatoid arthritis commonly cause dry eye through reduced tear quality, producing gritty discomfort. They do not improve tears or alter eye pressure.

24. 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. Weak cylinders are more forgiving.

25. B — A centration error inducing prism. Double vision in correctly powered glasses most likely reflects a centration error inducing unwanted prism. Coatings, tints, and warranties do not cause diplopia.

26. A — Minus lenses minify the image. A minus lens minifies, making the wearer's eyes appear smaller. A plus lens, by contrast, magnifies.

27. C — The optic nerve fibers serving the periphery. Glaucoma damages optic nerve fibers, characteristically eroding peripheral vision first while central vision is preserved until late. This is the mirror image of macular degeneration.

28. D — Blood-sugar changes shift the refractive error. Diabetes can cause blood-sugar-related refractive shifts and fluctuating vision. Recognizing this pattern is a reason to encourage medical follow-up.

29. B — Central retina (macula). Macular degeneration damages the central retina, impairing detailed central vision used for reading while peripheral vision is preserved. This is the mirror image of glaucoma.

30. B — The crystalline lens stiffened, reducing focusing ability. Presbyopia results from age-related stiffening of the crystalline lens, reducing its ability to change shape and focus on near objects. It is corrected with a plus add.

31. C — Significant difference between the eyes producing aniseikonia. Aniseikonia is a difference in the size of the two eyes' retinal images, disrupting fusion, often from significant anisometropia. Equal refractive error and coatings do not cause it.

32. C — Behind the retina, demanding accommodation. In hyperopia, relaxed-eye light focuses behind the retina, so the patient must accommodate to see, especially at near. A plus lens converges the light onto the retina.

33. A — A phoria, a latent deviation controlled by fusion. An inward turn appearing only when fusion is broken on cover testing is a phoria, a latent deviation held in check by fusion. A tropia, by contrast, is constant and manifest.

34. B — Clouds the crystalline lens. A cataract is an opacification of the crystalline lens, causing progressive blur, glare, and dimming. It is treated surgically with an intraocular lens implant.

35. D — Concentrated at the macula and tuned to bright light. Cones are concentrated at the macula and provide color and fine detail in bright (photopic) light. Rods, by contrast, handle dim-light and peripheral vision.

36. D — Rods, which serve dim-light and peripheral vision. Rods are highly light-sensitive and responsible for dim-light and peripheral vision without color. Poor function here impairs night and side vision.

37. B — The eyes rotate inward to maintain single near vision. Convergence is the inward rotation of the eyes to keep a near target single. Divergence is the opposite movement toward distance.

38. D — Exophthalmos, forward protrusion of the globes. Exophthalmos, a forward protrusion of the eyes most associated with thyroid disease, can affect frame fit and lid closure. It is the cause of the bulging appearance.

39. D — Impact resistance for safety. A child's everyday lenses must be polycarbonate chiefly for impact resistance and safety. Thinness, Abbe value, and cost are secondary for children.

40. B — A nylon cord seats in the groove. A semi-rimless mounting uses a nylon cord that seats in a groove cut around the lens edge. Each mounting type dictates its own edge treatment.

41. A — Horizontally polarized reflected light. Polarized lenses block horizontally oriented reflected glare, such as that off water. This selective blocking is what cuts surface glare.

42. D — Dilates the pupil while UV still reaches the eye. A dark non-UV lens dilates the pupil due to reduced brightness while letting UV reach the eye, which can be worse than no sunglasses. This is why UV protection must be confirmed separately.

43. B — Intermediate, arm's-length distances. The trifocal's middle zone serves arm's-length intermediate distances between distance and near. This is the gap a standard bifocal does not address.

44. B — Reduces surface reflections and glare. An anti-reflective coating cuts surface reflections and glare, improving night-driving clarity. It does not darken the lens or correct the prescription.

45. A — Fixed OC spacing may not match the patient's PD. OTC readers have a fixed optical-center spacing that can induce prism if it does not match the patient's PD, causing eyestrain. This is a key limitation of ready-made readers.

46. B — Resist cracking at the drilled holes. Rimless drill-mount lenses are stressed at the holes, so impact-resistant polycarbonate or Trivex resists cracking. Glass and brittle materials are inappropriate.

47. C — Darker at the top, lighter at the bottom. A gradient tint transitions from darker at the top to lighter at the bottom, suiting driving and cosmetic use. This distinguishes it from a uniform solid tint.

48. B — Is flatter and reduces the magnified-eye look. An aspheric lens is flatter and reduces magnification, making a high-plus wearer's eyes appear less enlarged. Steeper curves and thicker centers worsen the effect.

49. D — Ultraviolet radiation. Most photochromic lenses darken in response to UV exposure and lighten when UV is removed. This is why many darken less behind a windshield.

50. C — Spans the full lens width. The executive bifocal's near segment extends across the entire lens width, giving the widest near field. Its size also makes it heavier.

51. A — Plating can wear and expose the nickel alloy. A plated base-metal frame can provoke a nickel reaction because the plating wears and exposes the underlying nickel alloy. A hypoallergenic material like titanium avoids this.

52. C — Reflects more light than standard plastic. High-index lenses reflect more light at their surfaces, so an anti-reflective coating recovers transmission and reduces glare. This is why AR is commonly paired with high index.

53. B — Magnifying and enhancing contrast. Low vision aids work primarily through magnification and contrast/glare enhancement to maximize remaining vision. They do not restore acuity or reverse disease.

54. C — Uniform in density across the lens. A solid tint has the same density across the entire lens, unlike a gradient tint that varies top to bottom. Solid tints serve general sun and cosmetic use.

55. A — Intermediate and near working distances. An occupational/computer lens optimizes intermediate and near distances for desk and monitor work. A distance design would underperform at those ranges.

56. C — Lightweight, strong, and hypoallergenic. Titanium is lightweight, strong, corrosion resistant, and hypoallergenic, suiting allergy-prone patients. These properties make it a premium frame material.

57. D — Are not rated for occupational hazards. Ordinary dress lenses are not rated for occupational hazards like arc welding, so occupationally rated eyewear is required. Dispensing dress lenses silently would be a safety failure.

58. C — Added weight and a prominent segment line. The executive bifocal's full-width segment gives a wide near field but adds weight and a prominent visible line. These are its trade-offs.

59. B — Less dispersion and color fringing. A higher Abbe value means less dispersion and therefore less chromatic aberration (color fringing). The trade-off is a thicker lens for the same power.

60. B — A windshield blocks most UV. Photochromics activate via UV, which a windshield largely blocks, so they darken less in the car. This is a key limitation to disclose.

61. A — Surface nearest the eye. Spectacle power is specified as back vertex power, referenced to the surface nearest the eye, so the lens is read back-surface against the stop. This is the verification standard.

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

63. B — The vertex distance, which affects effective power. The distometer measures vertex distance, the gap from the lens to the cornea, which affects effective power in higher prescriptions. This is why it is used for strong Rxs.

64. A — Aligns to the light reflex on each cornea. A corneal reflex pupillometer measures PD accurately by aligning to the light reflex on each cornea. This precision determines correct optical-center placement.

65. C — Contains prescribed prism. A persistently displaced lensmeter target, even at the thickest point, indicates the lens contains prism. Coatings and treatments do not displace the target.

66. C — One surface's curvature at a time. A lens clock reads the curvature of one surface at a time, not the total back vertex power, which is the lensmeter's role. This is why it measures curvature, not power.

67. D — The extra plus power added for near. The add equals the near reading minus the distance reading because the add is the additional near plus power. It is obtained by difference, not read directly.

68. C — A material property, not a position-of-wear value. A digital measurement system captures position-of-wear data (PD, tilt, vertex, seg height) but not the Abbe value, which is a material property. This makes Abbe value the exception.

69. B — No prismatic deviation occurs. A centered, undisplaced lensmeter target indicates the optical center, where no prismatic deviation occurs. Displacement would indicate prism.

70. C — Measure small linear dimensions precisely. Calipers measure lens thickness and small linear dimensions in millimeters with precision. They do not measure power, PD, or UV transmission.

71. C — Displays readings electronically. An automatic lensmeter displays its readings electronically, reducing operator variability and reading error. It measures the same back vertex parameters as a manual instrument.

72. D — Is brittle and can crack. Cold plastic (zyl) is brittle and can crack when bent, so the frame must be warmed first to reshape safely. Metal frames, by contrast, are adjusted cold.

73. B — Protect the frame finish from marring. Padded nylon-jaw pliers grip frame parts without scratching the finish. Metal jaws on cosmetic surfaces would mar the frame.

74. A — Size or perimeter. A circumference (lens) gauge measures a lens's size or perimeter, used in edging and sizing. It does not measure power, curvature, or thickness.

75. D — Aligns each OC with its own pupil. Monocular PDs measure each eye separately, so each optical center aligns with its own pupil on an asymmetric face. A single binocular PD could misplace the centers.

76. D — Does not require heat to bend safely. Metal frames are generally adjusted cold because the metal bends safely without heat, unlike brittle cold plastic. Knowing which to heat is a practical distinction.

77. C — Rounded to shape bends. Round-nose pliers have rounded jaws used to form curves and bends in metal frame parts. Each plier shape serves a specific adjustment task.

78. B — It has one power in all meridians. A lens reading sphere power only is spherical because it has a single power in every meridian, with no second power or axis. A spherocylindrical lens would show two.

79. C — Changes the effective power at the eye. At +9.00 D, vertex distance changes the lens's effective power at the eye, requiring compensation. High powers are sensitive to vertex changes.

80. D — Angle and position the nose pads. Pad-adjusting pliers grip and angle the nose-pad arms to position the pads on a metal frame. Matching the plier to its task protects both the frame and the fit.

81. C — Avoids inducing unwanted prism in primary gaze. Correct optical-center placement keeps the OC in front of the pupil so no unwanted prism is induced in primary gaze, preventing eyestrain. This is the core purpose of accurate centration.

82. B — Rises into the distance viewing zone. A bifocal segment set too high rises into the distance viewing zone, intruding on distance vision. Correct seg height places the top near the lower lid.

83. B — Sufficient vertical (B) space for distance, intermediate, and near. A progressive needs adequate vertical (B) depth to fit its three power zones. A too-shallow frame cuts off the near area.

84. A — Soft peripheral zones the brain must learn to ignore. Progressive lenses have soft peripheral distortion zones the brain must learn to ignore, which is why a brief adaptation period is normal. It is not a power error.

85. D — Less lens material extends beyond the optical center. A smaller frame means less lens extends beyond the optical center, so a minus lens has thinner edges. A large frame keeps edges thick.

86. A — Reduces the effective plus power at the eye. Increasing the vertex distance on a high-plus 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.

87. A — The eyes drop below the OCs by different amounts when reading. Vertical imbalance arises in down-gaze because the eyes look below the optical centers by different amounts in anisometropia, inducing unequal prism. In primary gaze through the OCs no imbalance occurs.

88. D — Adds prism in the reading portion of one lens. A slab-off corrects reading-level vertical imbalance by adding prism in the reading portion of one lens. This neutralizes the imbalance in down-gaze.

89. B — The line of sight passes lower on the lens. As pantoscopic tilt increases, the line of sight passes lower on the lens, so the optical center is lowered (roughly 1 mm per 2° of tilt) to stay near it. Tilt and OC height are linked.

90. D — Lets the patient see far above it and near through it. A flat-top seg set at the lower-lid level lets the patient see over it for distance and into it for near. Setting it too high or low compromises one of those.

91. D — Changes the angle light enters the lens peripherally. A high-wrap frame angles the lens so peripheral light enters obliquely, requiring optical compensation to avoid distortion in a strong Rx. Thickness and blank size do not address the wrap optics.

92. A — It confirms whether the lab made the lenses correctly. Verifying the lenses against the Rx first confirms whether the lab made them correctly before pursuing fit or prescription causes. It is the logical starting point.

93. D — Intermediate zone. Clear distance and near but blurry arm's-length vision indicates a missing intermediate zone, supplied by a trifocal or progressive. A stronger distance or tint does not address it.

94. C — Working distances and tasks determine the best design. A lifestyle assessment changes the recommendation because the patient's daily working distances and tasks, more than the prescription alone, determine the best lens design. The same Rx can call for different products.

95. D — The frame is not sitting level. Objects appearing tilted with correct power point to a frame not sitting level, which adjustment can correct. Index, tint, and coating do not cause a tilted image.

96. C — More lens extends beyond the optical center. A larger frame means more lens extends beyond the optical center, increasing edge thickness for a minus Rx. A smaller, centered frame reduces it.

97. A — Reduces glare and reflections from oncoming lights. An anti-reflective coating reduces glare and reflections from oncoming headlights, improving night-driving clarity. A dark or mirrored lens would reduce useful light at night.

98. B — Each eye separately from the bridge center. Monocular PDs measure each eye separately from the bridge center, improving accuracy on an asymmetric face. A single binocular measurement can misplace the centers.

99. D — Too high relative to the lower lid. A bifocal that blocks distance vision was set too high relative to the lower-lid reference. Correct seg height places the top near the lower lid.

100. B — Too low relative to the pupil. A progressive whose reading area is hard to reach usually reflects a fitting cross set too low relative to the pupil. Correct placement is at the pupil center.

101. A — Within the allowed tolerance for its value. A finished lens passes ANSI Z80 when each parameter falls within its allowed tolerance, not when it matches every number exactly. "Within tolerance" is the practical standard.

102. B — FDA. The FDA requires that dress eyeglass lenses be impact resistant, regulating eyewear as a medical device. This is distinct from the ANSI Z87 occupational standard.

103. A — HIPAA's protected health information. A patient's prescription and identifiers are protected health information safeguarded under HIPAA. ANSI, FDA, and EPA rules govern products and the environment instead.

104. A — Workplace and educational eye protection. ANSI Z87 governs occupational and educational safety eyewear, imposing stricter impact and protection requirements. ANSI Z80 covers dress lenses, not safety eyewear.

105. B — Informing the patient of the eyewear's limitations. The duty to warn requires informing the patient that ordinary glasses are not rated for welding hazards. Dispensing them silently would be a safety and liability failure.

106. B — Environmental and hazardous waste. The EPA regulates environmental and hazardous waste, including chemical waste from an optical lab. HIPAA, the FDA, and ANSI address privacy and products instead.

107. D — 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.

108. B — Patients generally have a right to their own records. A patient is generally entitled to a copy of their own prescription. Withholding it or limiting them to a verbal summary is improper.

109. A — Axis error produces less blur with a weak cylinder. A weak cylinder tolerates a larger axis error because the same deviation produces less visual blur than with a strong cylinder. This is why ANSI Z80 axis tolerance scales with cylinder power.

110. D — Are not rated as occupational safety eyewear. Fashion sunglasses used for a hazardous task must carry a warning because they are not rated as occupational safety eyewear. This is a core duty-to-warn obligation.

111. C — Sports and recreational protective eyewear. ASTM standards most directly govern sports and recreational protective eyewear, distinct from ANSI Z87 (occupational) and Z80 (dress). Matching the standard to the use is the testable skill.

112. D — Permits release only as allowed or with patient consent. HIPAA permits releasing a patient's record to a third party only as the law allows or with the patient's consent. Arbitrary, unrestricted, or public disclosure violates privacy rules.

113. A — A separate property that must be confirmed. 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.

114. A — Informing them of a product's limitations and proper use. The duty to warn protects patients by informing them of a product's limitations and proper use. It does not alter Abbe value, thickness, or the need for standards.

115. B — HIPAA privacy and security rules. An EMR holding patient prescriptions must comply with HIPAA's privacy and security rules. ANSI and FDA standards govern products, not records.

116. D — The FDA sets the dress-lens impact rule; 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.

117. B — Lack the ASTM sports-protection rating. Dress glasses are unsuitable for racquetball because they lack the ASTM sports-protection rating. The optician should recommend ASTM-rated eyewear and warn of the limitation.

118. C — Falls within the permitted deviation for each parameter. "Within tolerance" under ANSI Z80 means each parameter falls within its permitted deviation, not that it matches every number exactly. This is the practical standard of acceptance.

119. C — Protect patient privacy and security. HIPAA aims to protect patient privacy and the security of health information, which is why PHI must be safeguarded. It does not govern lens tolerances, impact, or waste.

120. A — Permitted only as HIPAA allows or with consent. A patient is owed their own prescription, but third-party disclosure is permitted only as HIPAA allows or with the patient's consent. Convenient or public disclosure violates the rules.

121. C — Duty to warn. Giving a welding patient dress lenses without warning fails the duty to warn — the obligation to inform patients of a product's limitations. This exposes the optician to liability.

122. C — Occupational and educational safety eyewear. ANSI Z87 imposes stricter requirements than Z80 because it covers occupational and educational safety eyewear, which faces impact hazards. Z80 covers dress lenses.

123. D — Covers electronic and paper records alike. HIPAA governs protected health information in both electronic and paper form, so an electronic record is fully covered. It is not limited to paper records.

124. A — Has the greatest refracting surface at the air interface. The cornea contributes most of the eye's focusing power because its curved surface meets air, the interface where the greatest bending of light occurs. Its clarity and curvature are critical to vision.

125. B — Keeps the cornea smooth, clear, and nourished. The tear film keeps the cornea smooth and optically clear, supplies oxygen and nutrients, and maintains comfort. A poor tear film produces dry, gritty eyes and blur.