NOCE Practice Test

1. What strength is a lens measured in?

a. Microns
b. Add powers
c. Diopters
d. Prisms

2. What will light rays passing through a "plus" lens always do?

a. Diverge
b. Converge
c. Cohere
d. Disperse

3. What is the principle action on light passing from one medium into another of different density called?

a. Displacement
b. Convergence
c. Diffraction
d. Refraction

4. What range of UV light is typically responsible for sunburns?

a. 10 nanometers to 100 nanometers
b. 320 nanometers to 400 nanometers
c. 100 nanometers to 290 nanometers
d. 290 nanometers to 320 nanometers

5. What is the measure of how far it takes a lens to bring light to a point?

a. Focal length
b. Major axis
c. Power
d. Base curve

6. What is the spacing between the surface of the eye and the inside surface of a corrective lens known as?

a. Sagittal depth
b. Fitting cross
c. Seg drop
d. Vertex distance

7. What element of an eyeglass prescription is a measure of the patient's myopia or hyperopia?

a. Cylinder
b. Axis
c. Sphere
d. Add power

8. What are the two modern forms in which a prescription may be written?

a. Plus-cylinder and minus-cylinder
b. Cross-cylinder and plus-cylinder
c. Spherical and aspherical
d. Base curve and cross curve

9. A prescription of OD –0.25, OS Plano, Add +1.75 is primarily indicating what type of refractive error?

a. Hyperopia
b. Presbyopia
c. Stigmatism
d. Nystagmus

10. A prescription for a patient with astigmatism will contain which of the following elements?

a. Cylinder and sphere
b. Axis and add power
c. Cylinder and axis
d. Cylinder and prism

11. A prescription of OD +1.00 –0.50 x31 OS +1.75 –1.25 x168 is an example of what kind of prescription?

a. Spherocylindrical
b. Myopic
c. Aspheric
d. Anisometropic

12. A prescription is written as follows: OD –1.25 +1.75 x110. What transposed prescription would be written on the lab order?

a. –3.00 –1.75 x10
b. +0.50 –1.75 x110
c. Plano +1.75 x30
d. +0.50 –1.75 x20

13. If a patient insists on glasses for "near-vision only," which would be the correctly transposed numbers to order the following OU prescription: –0.75 +2.50 x11 add +1.25?

a. +1.75 –2.50 x101
b. +3.00 –2.50 x101
c. +0.50 +2.50 x101
d. +3.00 +2.50 x11

14. One of the early solutions for extreme hyperopia was a type of lens with a very steep curvature in a small central portion, surrounded by a flat carrier edge. This was known as what type of lens?

a. Myodisc
b. Meniscus
c. Lenticular
d. Corrected-curve

15. What is a lens with a single curvature on the front and two curvatures on the back called?

a. Cylindrical
b. Aphakic
c. Aspheric
d. Toric

16. What is the power of a corrective lens referred to as when calculated purely from its measurable curvatures?

a. Effective power
b. Surface power
c. Vertex power
d. Corrected power

17. What is the average refractive index of a polycarbonate lens?

a. 1.56
b. 1.60
c. 1.58
d. 1.67

18. What is the measurement of optical clarity of a lens called?

a. Reflectance
b. Transmittance
c. Snellen equivalent
d. Abbe value

19. What is the spherical equivalent of the following prescription: –2.25 +3.50 x171?

a. –0.50
b. –2.25
c. +0.50
d. +1.25

20. Given the prescription +1.00 –2.00 x135, what is the effective power in the 90th meridian?

a. –1.00
b. –3.00
c. Plano
d. +1.00

21. A prescription of +1.75 –2.75 x153 would be written in what way by an ophthalmologist?

a. +4.50 +2.75 x63
b. –1.00 +2.75 x63
c. –1.00 +2.75 x153
d. –2.75 +1.75 x153

22. A +4.00 lens intended to be positioned at a PD of 30 mm was actually manufactured at 33 mm. What is the amount of prism induced by this error?

a. 12 diopters
b. 0.75 diopters
c. 1.33 diopters
d. 1.2 diopters

23. Vertical imbalance error is always read at the _____ lens in the 90th meridian.

a. more minus
b. more plus
c. weaker
d. stronger

24. What is the dioptric power of a lens with a focal length of 400 mm?

a. +2.50
b. –2.50
c. +4.00
d. +0.25

25. A patient is refracted at 13 mm with a prescription of +12.00 OU, but it is found that the frame she selected will hold the lenses at a distance of 18 mm from her eyes. What prescription should the optician order to compensate for this discrepancy?

a. +12.77
b. +13.25
c. +10.77
d. +11.23

26. What kind of lens has powers that vary smoothly as the viewing angle is raised and lowered?

a. Trifocal lens
b. Progressive lens
c. Aniseikonic lens
d. Intra-ocular lens

27. Which of the following is true regarding full-seg or "executive" bifocals?

a. They are popular with younger presbyopes.
b. They are easy to manufacture in a wide variety of prescriptions.
c. They have the widest near field of view of any bifocal.
d. They incorporate the latest technological advances.

28. Which of the following multifocal styles will produce the least amount of image jump for the patient?

a. Progressive
b. Round-seg
c. Flat-top
d. Blended

Answer Key and Explanation

1. C: The diopter is the basic unit of measurement for refractive power and is defined as the ability to bend a coherent beam of light by 1 centimeter at a distance of 1 meter from the lens.

2. B: The shape of a plus-power lens is such that the light rays passing through will converge to a point.

3. D: As light passes from one medium (such as air) into a denser one (such as water), it is bent, or refracted.

4. D: Although the UV range begins at around 400 nanometers, it is the shorter wavelengths (below 320 nm) that cause the most damage to the skin. Fortunately, wavelengths shorter than about 290 nm are mostly absorbed by the Earth's atmosphere.

5. A: The focal length of the lens is the distance from its center to the point where the light rays converge to a point, or focus.

6. D: The vertex distance is a measure of how far a corrective lens is placed from the eye and can influence the effective power of the patient's correction if it varies from the distance the doctor used during the eye exam.

7. C: The sphere power of a prescription indicates whether a patient is myopic or hyperopic. Minus values denote myopia, whereas plus values indicate hyperopia.

8. A: Most modern prescriptions are written in minus-cylinder format. Ophthalmologists, simply by tradition, continue to write prescriptions in plus-cylinder format.

9. B: This patient's vision is nearly 20/20 at infinity, but he or she needs correction to read clearly at 35 cm. This condition is known as presbyopia.

10. C: Astigmatism is an out-of-roundness in a patient's cornea and will be oriented in a particular direction. The correction for this in his or her prescription will be a cylindrical value, oriented along a specific axis.

11. A: A sphero-cylinder prescription includes spherical correction for myopia or hyperopia in combination with cylinder power and axis to correct for astigmatism.

12. D: To transpose plus-cylinder prescriptions into minus-cylinder, one must first combine the sphere and cylinder values algebraically, then reverse the sign of the cylinder value, and finally invert the axis by 90 degrees.

13. B: To transpose a plus-cylinder prescription with an add into near-vision only for ordering, one must first combine the sphere and cylinder values algebraically, reverse the sign of the cylinder value, then invert the axis by 90 degrees, and finally combine the add power with the sphere power.

14. C: Rarely seen today, the lenticular lens was often used with aphakic patients (without natural crystalline lens or implanted IOLs). It had an odd appearance, but it did accomplish the goal of being lighter in weight than a full-field +16.00 lens would have been.

15. D: Toric lenses have two curvatures on the back side: one to correct for myopia or hyperopia and the other to correct astigmatism.

16. B: The surface power of a lens is calculated directly from its front and back curvatures, assuming a refractive index of 1.50.

17. C: The refractive index of polycarbonate is greater than mid-index (1.56) but less than high index (1.60 and 1.67), generally measured at about 1.58.

18. D: The scale measuring optical clarity was developed by German physicist Ernst Abbe and still bears his name.

19. A: The spherical equivalent of a prescription is found by halving the cylinder power (in this case, first transposing the prescription into minus-cylinder format, combining sphere and cylinder algebraically, changing the sign of the cylinder, and inverting the axis 90 degrees, resulting in +1.25 −3.50 x81) and combining it with the sphere power: −1.75 + 1.25 = −0.50. The axis is disregarded.

20. C: Along the line of the cylinder axis, the cylinder power has no effect. Its full effect is found 90 degrees from that axis. At 45 degrees from the axis, exactly half of the cylinder power comes into play, which in this case is −1.00, precisely canceling out the sphere power of +1.00, leaving the lens plano in that meridian.

21. B: Transposing from minus-cylinder to plus-cylinder is accomplished by first combining the sphere and cylinder powers algebraically, then reversing the sign of the cylinder, and finally inverting the axis by 90 degrees.

22. D: The Prentice formula (prism = [decentration x power] / 10) is applied here as follows: amount of decentration = 3 mm, lens power = 4 diopters—3 x 4 = 12, divided by 10 = 1.2 diopters of prism induced.

23. C: Because unwanted vertical prism is a relative value, its effect is measured on the weaker lens of the two, which determines the end effect on the patient.

24. A: Focal length (in meters) is the reciprocal of dioptric power. In this case, the conversion formula would read 1 divided by 0.4 meters, or 2.50. Because the lens has a measurable focal length, it must be a plus lens.

25. D: The vertex formula is Dc = D / (1-dD), where D is the written power, d is the vertex deviation in meters, and Dc is the resulting change in effective power. Therefore, 12.00 / (1 – [.005 x 12]), or 12 / (1-.06), or 12 / .94 = 12.77 for the effective power at an 18 mm vertex distance because a plus lens always increases with the vertex. The increase of 0.77 should be subtracted, ordering a compensated power of +11.23.

26. B: The progressive-addition multifocal has a power corridor down the center, which smoothly increases the power of the lens toward the bottom.

27. C: Although this archaic lens style is seldom used anymore, it did feature a near visual field that spanned the entire lower portion of the lens.

28. A: Image jump happens when the eye is forced to quickly transition from one lens curvature to another. Even the blended bifocal has an unpleasant “blur zone” at the edge of the add power, which suddenly shifts the image. Progressive lenses eliminate this problem as nearly as possible.