Review Questions for Vision topic

Review questions will not be collected and are not worth any points. Doing them will, however, help you prepare for the midterms and quizzes in this course. Furthermore, some of these review questions will appear on the final exam (although the numbers within the questions may be changed).

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1) The **outer** muscles on the eye are called the _____ muscles. They are skeletal muscles that control voluntary eye movements such as looking left, looking right, etc.

A) Tunic
B) Ciliary
C) Ocular
D) External

2) The wall of the eye has three layers called the _____ of the eye.

A) Tunics
B) Luminous strata
C) Vision lamella
D) Ocular epithelium

3) Which is **not** one of the three tunics?

A) Sclera/Cornea
B) Retina
C) Ciliary body
D) Choroid coat

4) Light enters the interior of the eye through a small hole called the _____.

A) Cornea
B) Iris
C) Lens
D) Pupil

5) The colorful part of the eye (the part that can be brown, blue, gray, or green) is called the _____.

A) Cornea
B) Iris
C) Lens
D) Pupil

6) In innermost tissue layer of the eye contains sensory neurons that transduce light into nerve signals. This layer of the eye is called the _____.

A) Optic sclera
B) Optic nerve
C) Retina
D) Endoneurium

7) Rods and cones are sensory cells that respond to light. Together, they are called _____ cells.

A) light receptor
B) lumireceptor
C) oculoreceptor
D) photoreceptor

8) The retina has three layers of nervous tissue. Which is the correct order of the retina's layers, from anterior to posterior?

A) Ganglion cells, Bipolar cells, Photoreceptors
B) Photoreceptors, Ganglion cells, Bipolar cells
C) Bipolar cells, Ganglion cells, Photoreceptors
D) Bipolar cells, Photoreceptors, Ganglion cells

9) Within the retina

A) the photoreceptors synapse directly with the bipolar cells.
B) the bipolar cells stimulate the photoreceptors.
C) the ganglion cells are directly coupled to the photoreceptors.
D) bipolar cell axons form the optic nerve

10) The optic nerve is composed of axons extending from the ____ cells in the retina.

A) ganglion
B) bipolar
C) cone
D) photoreceptor (rods and cones)

11) The area of the eye where the optic nerve passes through the retina is called the _____.

A) Sclera fenestra
B) Nerve foramen
C) Blind spot
D) Pupil

12) What can cones do that rods cannot do?

A) perform vision at normal daylight intensities.
B) provide sharply detailed vision.
C) provide color vision.
D) cause contraction of the involuntary eye muscles.

13) Which is **not** one of the cone types?

A) Yellow
B) Blue
C) Green
D) Red

14) The function of the lens of the eye is to

A) serve as the major site of focusing of light rays.
B) control the size of the pupil.
C) control the amount of light entering the eye.
D) All of these are functions of the lens.

15) To keep an object in focus when the object is near the eye, the ciliary body muscles change the shape of the lens. This process is called _____.

A) myopia.
B) hyperopia.
C) adaptation.
D) accommodation.

16) When a far object is sharply focused on the retina the

A) the iris relaxes the pupil
B) the pupil is rotated by the sclera
C) ciliary muscle is relaxed.
D) the retina is relaxed

17) The visual disorder where far objects can be focused but near objects can't is sometimes called "far sighted", but the correct term for the condition is _____.

A) myopia.
B) hyperopia.
C) astigmatism.
D) cataracts.

18) The visual disorder where near objects can be focused but far objects can't is sometimes called "near sighted", but the correct term for the condition is _____.

A) myopia.
B) hyperopia.
C) astigmatism.
D) cataracts.

19) Define the following terms, as they were defined in class.

a) Visual acuity

b) Accommodation

c) Emmetropia

d) Adaptation

20) Each eye has how many extrinsic (external) muscles to move the eyeball? _____

21) The eye wall is composed of three layers, which are called "_____."

22) The outermost tunic of the eyeball has two regions: In the front, it is clear, forming the _____. The other areas are white, and form the _____.

23) The middle tunic of the eye is called the _____

24) The _____ is the innermost tunic of the three eye wall tunics.

25) In the front of the eye, the _____ is the pigmented area surrounding the pupil. Its purpose is to _____.

26) A defect (a non-smooth area) in the lens or the cornea that causes one part of the field of vision to be blurry is called a(n) _____.

27) In dimly lit areas, the pupil will dilate/contract (circle one).

28) The choroid coat of the eye contains what two structures/substances?

29) Which muscles of the eye are smooth muscles?

30) The _____ is the clear part of the eye that focuses light images on the retina. Many patients benefit from having it re-shaped with a laser to correct myopia, hyperopia, or astigmatism.

31) _____ are neurons that sense light energy; they are found in the retina.

32) What are the two major types of photoreceptors called? _____ and _____.

33) The _____ are the photoreceptors that provide color vision and the _____ are the photoreceptors that provide black-and-white vision.

34) What are the three types of color-sensing photoreceptors (what colors)? ____, ____, and ____.

35) The retina has three sub-layers. The cells of the three layers (from anterior-most to posterior-most) are called _____, _____, and _____.

36) In order to be absorbed by photoreceptors, light must actually pass through the _____ layer and the ____ layer of the retina.

37) The axons of the retinal ganglion cells run along the surface of the retina then they become bundled together, pass through the back of the eye, and connect to the brain. This bundle of axons is called the _____.

38) The region of the retina where the axons of the retinal ganglion cells leave the eye is called the _____ or _____, and lacks _____.

39) Color blindness is due to the genetic absence of one type of _____.

40) Color blindness is more common in which sex? _____

41) The retina generates a nerve signal when it is struck by light. Use the numbers 1 – 5 to indicate in what order the nerve signal passes through the following structures:

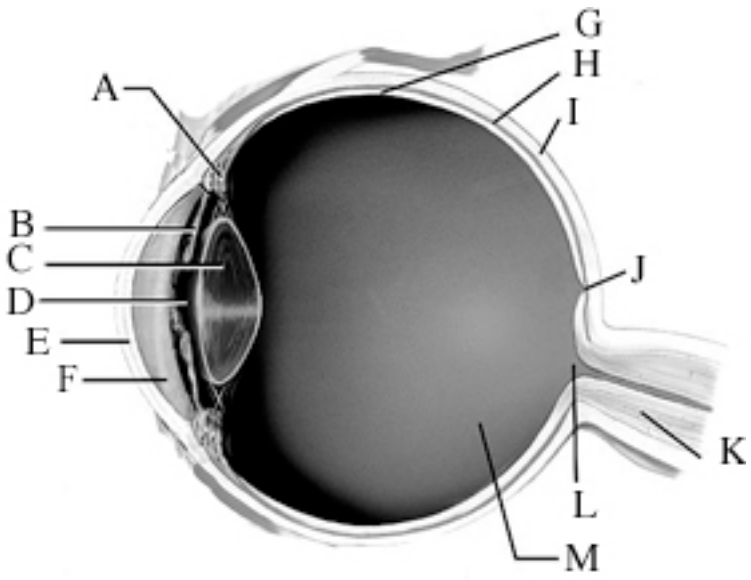
Optic nerve: ____
Ganglion cell: ____
Visual area of cerebrum: ___
Photoreceptor cell: ____
Bipolar cell: ____

42) When a visual pigment molecule in a photoreceptor cell is hit by light, this results in the photoreceptor cell generating a _____.

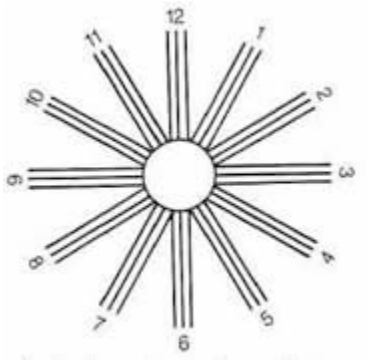
43) When performing the visual acuity test using the Snellen eye chart, how far away from the chart does the subject stand? _____ feet. What number is considered normal vision? _____.

44) 20/15 vision is better/worse (circle one) than 20/20 vision.

45) In the diagram below, name the eye parts with letters. You can omit letters F, J, and M.



46) In lab, the chart below was used to test for what eye disorder?



47) Astigmatism is caused by a defect (non-smooth area) in the _____ or the _____.

48) _____ is the ability of eye to focus on near objects.

49) Accommodation occurs when the _____ bends the _____ into a different shape.

50) In a relaxed eye, the lens focuses far/near (circle one) objects on the retina.

51) Contracting the ciliary body of an eye results in focusing far/near (circle one) objects on the retina.

52) _____ is nearsightedness: All focal points are anterior/posterior (circle one) compared to where they normally are found.

53) _____ is farsightedness: all focal points are anterior/posterior (circle one) compared to where they normally are found.

54) Which disorder (hyperopia or myopia) is the one where the person can see far objects but not near objects? _____

55) The vision problem _____ occurs when the focal point of the lens is deeper than (behind) the retina.

56) If a person with myopia is looking at a near object and their ciliary body is relaxed, the focal point of the object will fall in front of/on/behind (circle one of the three) the retina.

57) If a person with myopia is looking at a near object and their ciliary body is contracted, the focal point of the object will fall in front of/on/behind (circle one of the three) the retina.

58) If a person with myopia is looking at a far object and their ciliary body is relaxed, the focal point of the object will fall in front of/on/behind (circle one of the three) the retina.

59) If a person with hyperopia is looking at a far object and their ciliary body is contracted, the focal point of the object will fall in front of/on/behind (circle one of the three) the retina.

60) If a person with hyperopia is looking at a far object and their ciliary body is relaxed, the focal point of the object will fall in front of/on/behind (circle one of the three) the retina.

61) Name the test you performed in lab to measure how close an object could be and still be focused.

62) Explain briefly how you performed the near point of accommodation test.

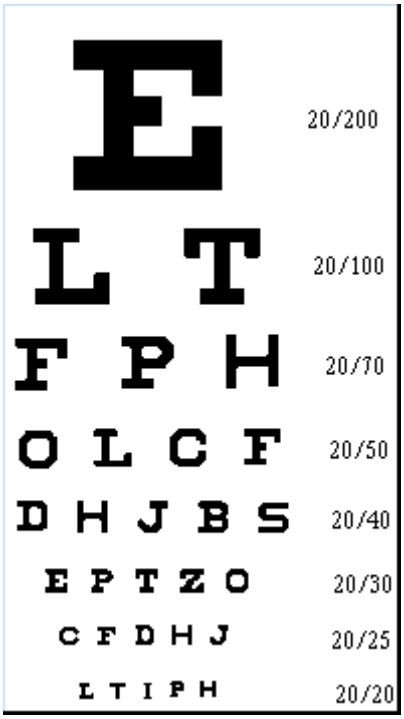
63) _____ is a problem in which the cornea or lens is unevenly shaped, so that some objects appear blurry but others are in focus.

64) Match these terms with the appropriate description:

____Myopia	(a) A region of abnormal curvature of the cornea or lens
____Hyperopia	(b) All light is focused abnormally shallow in the eye
____Presbyopia	(c) Normal focusing ability of the eye
____Astigmatism	(d) All light is focused abnormally deep in the eye
____ Emmetropia	(e) Loss of lens elasticity

65) Describe how, in the normal functioning of the eye, the shape of the lens is changed, and use this information to explain how images are kept in focus on the retina as a distant object is brought closer to the eyes.

66) Name the vision test that the chart below was used for in lab.



67) Explain the reason for blurred vision in a person with myopia, and describe how this person's vision is improved by the lenses in a pair of glasses.

68) What do the external eye muscles do? In what ways are they different from the other eye muscles (the iris and the ciliary body)?

69) Explain (in two or three sentences) what is the anatomical reason that we have a blind spot. In other words, what is at that spot instead of light-detecting cells?

70) If you stare at a blue-green colored dot for 30 seconds and then look at a white piece of paper, you will see a colorful after-image of the dot.

a) What color will the after-image be? _____

b) Explain briefly (2–3 sentences) what causes this phenomena:

Answers for Review Questions for Vision Review topic:

1) D

2) A

3) C

4) D

5) B

6) C

7) D

8) A

9) A

10) A

11) C

12) C

13) A

14) A

15) D

16) C

17) B

18) A

19) a) The ability of the eye to form sharp in-focus images

b) The ciliary body muscles changing the shape of the lens to move all focal points forward to focus on near objects.

c) Normal vision (far objects and near objects can be focused)

d) When a sense organ stops responding to a stimulus when it has been over stimulated by that stimulus.

20) Six

21) Tunics

22) Cornea
Sclera

23) Choroid coat

24) Retina

25) Iris
Control the size of the pupil (to regulate the amount of light entering the eye).

26) Astigmatism

27) Dilate

28) Blood vessels
Light-absorbing pigments

29) The iris and the ciliary body are smooth muscles. (The external eye muscles are skeletal muscles, not smooth muscles).

30) Lens

31) Photoreceptor cells

32) Cones and rods

33) Cones
Rods

34) Red
Blue
Green

35) Ganglion cells
Bipolar cells
Photoreceptor cells

36) Ganglion cell
Bipolar cell

37) Optic nerve

38) Blind spot
Optic disk
Photoreceptor cells

39) Cone types

40) Males

41) Optic nerve = 4
Ganglion cell = 3
Visual area of cerebrum = 5
Photoreceptor cell = 1
Bipolar cell = 2

42) Nerve signal

43) 20
20/20

44) Better

45) a) Ciliary body
b) Iris
c) Lens
d) Pupil
e) Cornea
g) Retina
h) Choroid coat
i) Sclera
k) Optic nerve
l) Blind spot/optic disk

46) Astigmatism

47) Lens
Cornea

48) Accommodation

49) Ciliary body
Lens

50) Far

51) Near

52) Mypoia
Anterior (forward)

53) Hyperopia
Posterior (deep)

54) Hyperopia

55) Hyperopia

56) On

57) In front of

58) In front of

59) On

60) Behind

61) Near point accommodation

62) An object (such as a pen) was slower brought closer and closer to the test sunject's eye. A ruler was used to measure the closest distance that the subject could keep the object in focus.

63) Astigmatism

64) Mypoia = b
Hyperopia = d
Presbyopia = e
Astigmatism = a
Emmetropia = c

65) The ciliary body muscles, which surround the lens of the eye, can change the shape of the lens. When a person is looking at a far object, the ciliary body muscles are relaxed and the lens' shape is such that it focuses far object onto the retina. When a person looks at a near object, the ciliary body muscles contract. This changes the shape of the lens such that near objects are focused onto the retina.

66) Visual acuity test using the Snellen eye chart

67) In myopia, the shape of the lens has changed such that the focal points of all objects are abnormally forward in the eye. To correct this problem, glasses (or contact lenses) are worn that move all focal points backward.

68) The external eye muscles move the eye up, down, left, right, and diagonally. In other words, they control what direction the eye is looking. They are different from the eye muscles of the iris and ciliary body in that the external muscles are skeletal (voluntary) mucles, whereas the iris and ciliary body muscles are smooth (involuntary) muscles.

69) There are three layers of neurons in the retina of the eye. The ganglion cells are the last group of neurons in the retina to receive the nerve signal when light is detected. The axons of the ganglion cells bundle together and then the bundle of axons (which is the optic nerve) passes through the back wall of the eye. At the location where the optic nerve passes through the back of the eye, the nerve takes up all the room so there is no room left for photoreceptor cells, and therefore no light can be detected at that location of the retina.

70) Red

There are three cone types of photoreceptor cells in the retina: Blue, green, and red. If a person stares at a blue-green dot for a long period of time, the blue and green cones undergo “adaptation,” which means they temporarily stop responding to the stimulus they normally detect (blue and green light, in this case). When the person starts to look at a white piece of paper (which normally stimulates all three cones types) the blue and green cones are not stimulated (because they are still undergoing adaptation). The only cones that respond, therefore, are the red cones. This produces a red after image of the dot.