



Page 269

Q1. Convex lens

Q2. Two parts which refract light rays are cornea and eye-lens.

Q3.

(a) Iris

(b) Retina

(c) Ciliary muscles

Q4.

(a) Cornea

(b) Retina

Q5. At retina

Q6. Eye lens changes its shape and thickness to focus light on to the retina.

Q7. Pupil expands or contracts according to the intensity of light around the eye.

Q8. The pupil of our eye contracts.

Q9. Retina

Q10. Blind spot

Q11. Retina

Q12. Rods and cones

Page 170

Q13.

(a) Cones

(b) Rods

Q14. True

Q15. The principal function of the eye-lens is to focus light on to the retina.

Q16. At cornea

Q17. Ciliary muscles

Q18. The ciliary muscles make the eyes lens thicker (more converging).

Q19. The least distance of the distinct vision for a normal human eye is about 25cm.

Q20.

(a) The far point of a normal human eye is at infinity.

(b) The near point of a normal human eye is at 25cm from the eye.

Q21. Range of vision of a normal human eyes is from infinity to about 25cm.

Q22. Ciliary muscles

Q23. The ability of an eye to focus the distant objects as well as the nearby objects on the retina by changing the focal length of its lens is called the power of accommodation.

Q24. (a) Optic nerve

(b) Ciliary muscles

(c) Pupil

(d) Cornea

(e) Eye lens

Q25.

(a) cornea

(b) retina

(c) iris

(d) large

(e) light

(f) eye-lens

(g) thinner

(h) thicker

Q26. The normal eye is not able to see clearly the objects placed closer than 25 cm because all the power of accommodation of the eye is exhausted at a distance of 25 cm. The maximum accommodation of the eye is reached when the object is placed at 25 cm from the eye. After this the ciliary muscles cannot make the eye-lens more thick.

Q27.

(a) Eye-lens becomes thicker.

(b) Eye-lens become thinner.

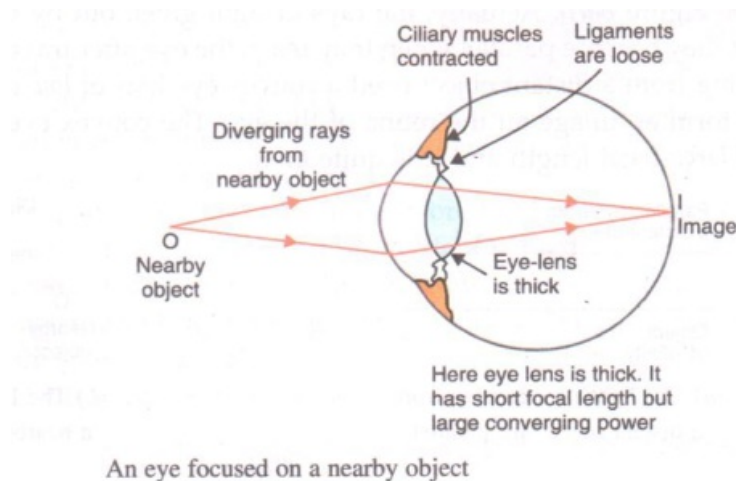
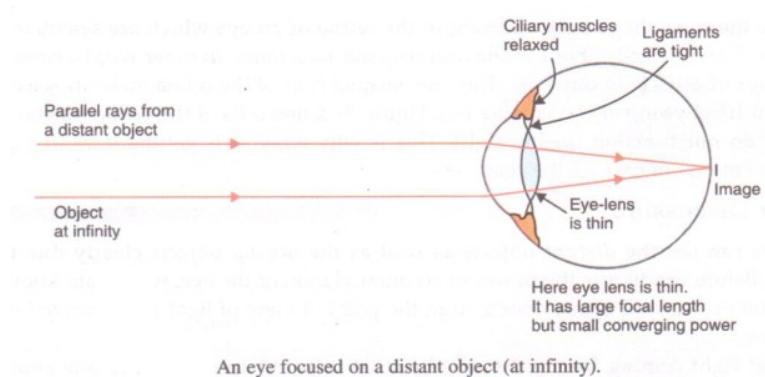
Q28.

(a) When the eye is focused on a distant object.

(b) When the eye is focused on a nearby object.

Q29.

To focus on distant objects, the ciliary muscles of the eye get fully relaxed and pull the suspensory ligaments attached to the eye-lens tightly. This, in turn, stretches the eye-lens and the eye-lens becomes thin.



To focus on nearby objects, the ciliary muscles of the eyes contract and make the suspensory ligaments loose. The ligaments then stop pulling the eye-lens. The eye-lens bulges under its own elasticity and becomes thick.

Q30. The amount of light entering the eye is controlled by the iris. It automatically adjusts the size of the pupil according to the intensity of light received by the eye. If the amount of light received by the eye is large, then the iris contracts the pupil and reduces the amount of light entering the eye. If the amount of light received by the eye is small, then the iris expands the pupil so that more light may enter the eye.

Q31. When we enter a darkened cinema hall from bright sunshine, at first we cannot see anything clearly. After a short time our vision improves. This is because in bright sunshine the pupil of our eye is small and when we just enter the darkened room very little light enters our eye due to which we cannot see properly. After a while,

when the pupil of our eye expands, more light enters our eye and we can see clearly.

Q32. It takes some time to see objects in a dim room when we enter the room from bright sunshine outside because it takes some time to the small pupil of our eye to become large so that more light enters our eye and we can see clearly.

Page 271

Q33.

(a) Pupil becomes smaller.

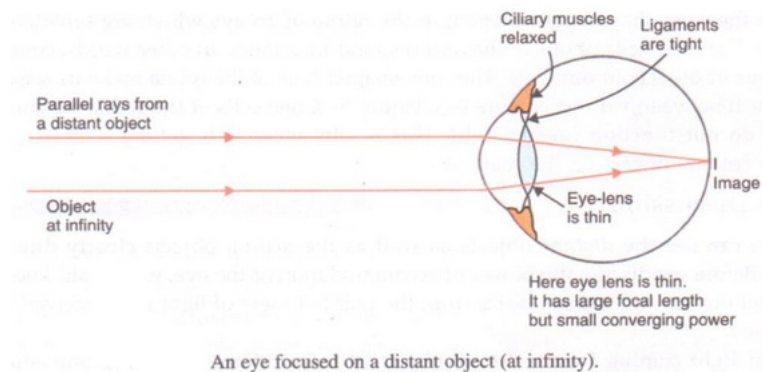
(b) The amount of light entering the eye is reduced.

Q34.

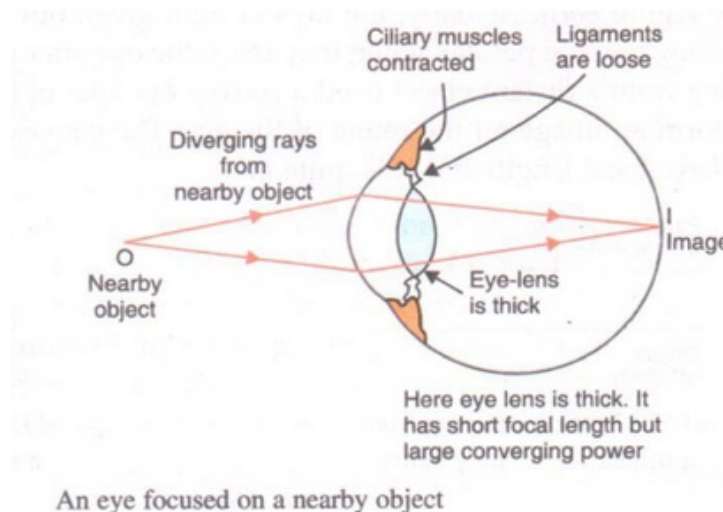
Ciliary muscles get relaxed and the eye lens becomes thin when the eye is looking at a distant object, and these muscles contract and make the eye-lens thick when the eye is looking at a nearby object. Thus, ciliary muscles help in the normal functioning of the eye by changing the thickness of the eye-lens while focussing.

Q35.

To focus on distant objects, the ciliary muscles of the eye get fully relaxed and pull the suspensory ligaments attached to the eye-lens tightly. This, in turn, stretches the eye-lens and the eye-lens becomes thin. This thin eye-lens has large focal length and small converging power sufficient to converge the parallel rays of light coming from a distant object to form an image on the retina.



To focus on nearby objects, the ciliary muscles of the eyes contract and make the suspensory ligaments loose. The ligaments then stop pulling the eye-lens. The eye-lens bulges under its own elasticity and becomes thick. This thick eye-lens has small focal length and large converging power which converges the diverging rays coming from the nearby object to form an image on the retina.



Q36.

(a) The two types of light-sensitive cells are found in the retina.

(b) They are called rods and cones.

(c) Rods are sensitive to dim light and cones are sensitive to bright light and colours.

Q37.

Rods are the rod-shaped cells present in the retina of an eye which are sensitive to dim light.

Cones are the cone-shaped cells present in the retina of an eye which are sensitive to bright light.

Our night vision is relatively poor compared to the night vision of an owl due to the presence of relatively smaller number of rod cells in the retinas of our eyes.

Q38.

(a) The focal length of the convex eye-lens can be changed by the action of ciliary muscles, but the focal length of the ordinary convex lens made of glass is fixed.

(b) Cornea, pupil, eye-lens, retina.

Q39.

(a) (i) In dim light, pupil becomes large.

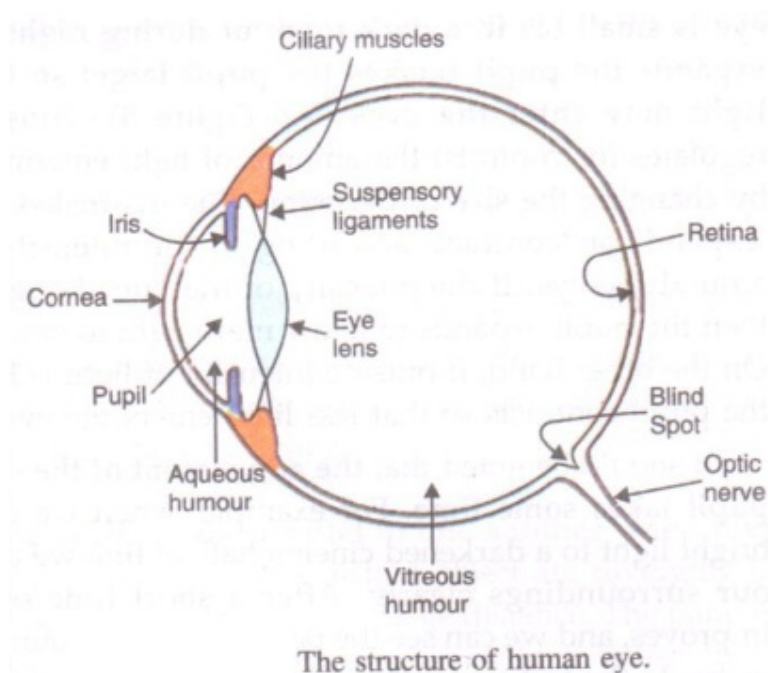
(ii) in bright light, pupil becomes small.

(b) (i) Cones

(ii) Rods

(iii) Cones

Q40.



(b) Working of the human eye

The light rays coming from the object kept in front of the eye enter the cornea, pass through the pupil and fall on the eye lens. The eye lens is a convex lens, so it converges the light rays and produces a real and inverted image of the object on the retina. The image formed on the retina is conveyed to the brain by the optic nerve and gives rise to the sensation of vision.

(c) The eye adjusts itself to deal with light of varying intensity with the help of the iris. The iris automatically adjusts the size of the pupil according to the intensity of light received by the eye. If the intensity of light is large, then the iris contracts the pupil and reduces the amount of light entering the eye. And, if the intensity of light is small, then the iris expands the pupil so that more light may enter the eyes.

Q41.

(a) a. Cornea: It is the front part of the eye. The light coming from objects enters the eye through the cornea.

b. Iris: It controls the amount of light entering the eye.

- c. Pupil: It controls the illumination in the eye.
  - d. Ciliary muscles: The focal length of the eye-lens can be changed by changing its shape by the action of ciliary muscles.
  - e. Eye-lens: It focuses light on to the retina.
  - f. Retina: It is a delicate membrane having a large number of light sensitive cells called 'rods' and 'cones' which respond to the intensity of light and colour of objects respectively.
  - g. Optic nerve: It conveys the image formed on the retina to the brain.
- (b) If we walk from a dark room into sunlight, the pupil of the eye contracts. On again entering the dark room, the pupil of the eye expands.
- (c) When we enter a darkened cinema hall from bright sunshine, at first we cannot see our seats clearly but gradually they become visible. This is because in bright sunshine the pupil of our eye is small and when we just enter the darkened room very little light enters our eye due to which we cannot see properly. After a while, when the pupil of our eye expands, more light enters our eye and we can see clearly.

Page 272

Q53.

- (i) d
- (ii) c
- (iii) a
- (iv) e
- (v) b

Q54.

- (a) Thick
- (b) Thin

Q55.

Irises help to protect the retinas of our eyes from damage by bright light by adjusting the size of the pupil according to the intensity of light received by the eye.

Q56.

- (a) Cornea and eye-lens
- (b) Cornea
- (c) Eye lens

By changing its thickness and hence conversing power.

Q57.

Ciliary muscles should change the shape of eyes-lens to make it thicker and increase its converging power.

Q58.

The eye-lens does not have to do all the work of converging incoming light rays because cornea of the eye also converges light rays entering the eye.

Q59.

The color detecting cells of the retina of the eye called 'cones' do not work well in dim light.

Q60.

Wide pupils allow more light to enter the eye during night.

Rod cells in the retina are sensitive to dim light and hence help in seeing properly at night.

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