

HUMAN EYE

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Q.1. Explain the structure of eye.

Ans: The human eye is like a camera. Its lens system forms an image on a light sensitive screen called the retina.

The eye ball is approx. spherical in shape with a diameter of 2.3cm.

The human eye has the following parts:-

- (a) Cornea:-The transparent spherical membrane covering the front of the eye.
- (b) Iris:-The coloured diaphragm between the cornea and lens.
- (c) Pupil:-The small hole in the iris.
- (d) Eye lens:-Its is a transparent lens made of jelly like material.
- (e) Ciliary muscles:-These muscles hold the lens in position.
- (f) Retina:-The back surface of the eye.
- (g) Blind spot:-The point at which the optic nerve leaves the eye. An image formed at this point is not sent to the brain.
- (h) Aqueous humour:-A clear liquid region between the cornea and the lens.
- (i) Vitreous humour:-The space between eye lens and retina is is filled with another liquid called Vitreous humour.

Q.2.How we are able to see in dim and bright light?

Ans: Our retina's 125 million rods are used only in dim light and help us to see in dim and bright light

Q.3.What is the function of the ciliary muscles?

Ans: Changes focal length of eye lens.

When we see distant objects, the ciliary muscles are relaxed, the lens becomes thin. This, increase focal length of lens . This enables us to see distant objects clearly.

When you are looking at objects closer to the eye, the ciliary muscles contract. The eye lens becomes thicker. Consequently, the focal length of the eye lens decreases. This enables us to see nearby objects clearly

Q.4.What kind of image is formed by eye-lens?

Ans: Real, inverted and diminished

Q.5.What are photoreceptors?

Ans: Photoreceptors are millions of specialized neurons that detect and respond to light, there are 2 types of photoreceptors called rods and cones

Q.6.How we can see colours?

Ans: We see colour because of the Rods and Cones in our eyes

Q.7.What is persistence of vision?

The impression of image is remains on retina for about $1/16$ th of second is called persistence of vision.

This is used during cinematography. The sequence of still picture taken by movie camera is projected on the screen at the rate of 24 or more images per second so that images merge in one another on screen.

Q.8.How does persistence of vision help to see the object as moving?

Persistence of vision of retina help to merge images in one another on screen help to see the object as moving .

Q.9.How we are able to see a moving picture?

Ans Due to persistence of vision of our eyes, images merge in one another with in $1/16$ th of second and we can see movie.

Q.10.Which principle is used in cinematography?

Ans: persistence of vision.

Q.11.What happens when an object is brought closer to the eye and why?

When an object is brought closer to the eye the ciliary muscles contract. The eye lens becomes thicker. Consequently, the focal length of the eye lens decreases. This enables us to see nearby objects clearly

Q.12 What is the far point and near point of the human eye with normal vision?

Ans: The farthest distance at which an object clearly can be seen clearly. It is infinity for normal eyes.

The nearest distance at which an eye focus image clearly of an object is called near point. It is 25 cm from the eye.

Q.13.What are the three defects of the eye?

Ans: There are mainly three common refractive defects of vision. These are (i) myopia or near-sightedness, (ii) Hypermetropia or farsightedness, and (iii) Presbyopia

Q.14. What are the different reasons for vision problems?

Ans: Myopia- This defect may arise due to (i) excessive curvature of the eye lens, or (ii) elongation of the eyeball

(b) Hypermetropia: This defect arises either because (i) the focal length of the eye lens is too long, or (ii) the eyeball has become too small

Presbyopia - It arises due to the gradual weakening of the ciliary muscles and diminishing flexibility of the eye lens

Q.15. Who developed Braille system?

Ans: The Braille system was based on a method of communication originally developed by Charles Barbier.

Q .16 Why are we not able to see immediately after we enter a darkened hall?

Ans. When we are in bright sunlight, outside a darkened hall, iris makes pupil small to receive less light. When we enter a darkened hall from outside, the eye is not able to see with the reduced amount of light entering the pupil. Depending on the darkness of the hall iris increases the size of the pupil to receive more light and then after sometime we are able to see things around us in a semi dark room also.

Q .17 why in poor light we cannot perceive the true colours of an object?

Ans. In dim light the rods are sensitive but cones are not. Cones are responsible for perception of colours.

Q. 18. Which part in the eye provides the most of refraction of the light entering the eye?

Ans. Cornea and aqueous humor.

Q. 19. Why birds wake up with sunrise and sleep in the resting place by sunset.

Ans. Their retina has cones in excess, which are sensitive to bright light only.

Q. 20. Which is the most insensitive part of the eye retina?

Ans. Blind spot is the spot on retina, which is insensitive to light.