Light

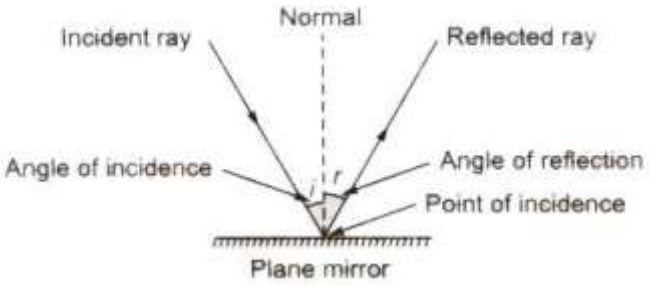
1. **What is Light?**
   Ans. Light is a form of energy which travels in straight line.

2. **How can we see any object?**
   Ans: We see an object when light is falling on the object bounces off it and reaches our eyes. The light energy creates an image in the eyes, and the brain interprets it as the object seen.
3. **What are Laws of Reflection?**
   Ans. Laws of Reflection
   1. The first law of reflection states that the incident ray, reflected ray, and the normal to the surface of the mirror, all lie in the same plane.
   2. The second law of reflection states that the angle of reflection is equal to the angle of incidence.

4. **What is Incident ray?**
   Ans. The ray of light falling on the surface separating the two media, is called Incident Ray.

5. **What is Refracted Ray?**
   Ans. The ray of light is travelling in the other medium in the changed direction is called Refracted Ray.

6. **What is Normal?**
   Ans. The perpendicular drawn on the surface separating the two media at the point where the incident ray strikes it i.e. at the point of incidence is called the Normal.



7. **What is Angle of Incidence?**
   Ans. The angle between the incident ray and the normal is called Angle of Incidence. It is denoted by "i".

8. **What is Angle of Refraction?**
   Ans: The angle between Refracted Ray and the Normal is called Angle of Refraction. It is denoted by "r".

9. **What is the definition of Beams of Light?**
   Ans. A group of light rays which are travelling together is called a beam of light.

10. **What are Parallel Beams of Light?**
    Ans. It consists of light rays that travel parallel to one another.
    A beam of light which comes from a source located very far has light rays parallel to one another.

11. **What are Divergent Beams of Light?**
    Ans. It consist pf light rays that come from a source and travel in different direction.

12. What are Convergent Beams of Light?

Ans. Convergent Beams of Light consists of light that come from different directions and meet at a point.

13. What is Virtual Image?

Ans. The image which can be seen only into a mirror but cannot be obtained on a screen is called a virtual image.

14. What is Real Image?

Ans. The image which can be seen on screen are called Real Image.
It is formed when the light rays after reflection or refraction actually intersect each other.

15. What are the differences between Real Image and Virtual Images?

Ans.

Real Image	Virtual Image
It can be taken on the screen	It cannot be taken on the screen.
It is always inverted.	It is always erect but laterally inverted.
The rays of light after reflection or refraction actually meet at a point.	The rays of light after reflection or refraction appear to meet at a point.

16. What are the characteristics of formed by a plane mirror?

Ans. Some characteristics of images formed by plane mirror are

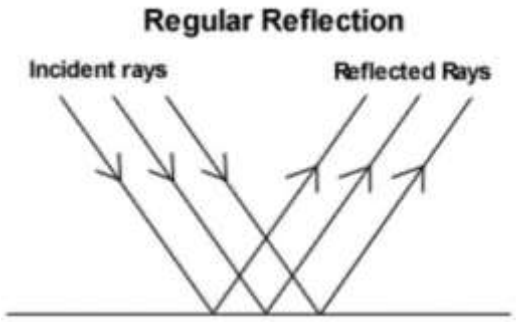
(i) The image is as far behind the mirror as the object is in front of it.
(ii) The image formed is erect.
(iii) The image is of the same size as the object.
(iv) The image formed is virtual, which means, such an image cannot be caught on a screen.
(v) The image is laterally inverted that is the right side of the object appears as the left side of the image.

17. Reflection are how many types?

Ans. Reflection are two types:
a. Regular Reflection
b. Irregular or Diffused Reflection

18. What is Regular Reflection?

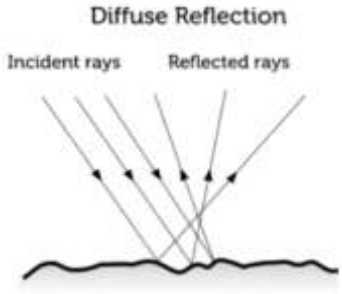
Ans. When a beam of parallel rays falls on a smooth and polished surface and is reflected from it, the rays remain parallel. This is called Regular Reflection.
Ex: Reflection on a plain mirror is an example of Regular Reflection.



19. What is Irregular Reflection?

Ans. When a beam of parallel Rays falls on a rough and dull surface, the light rays are scattered in all direction. This is called Irregular or Diffused Reflection.

Ex: Reflection on Rough wall is an example of Irregular Reflection.



20. What is the difference between Regular and Irregular Reflection?

Regular Reflection	Irregular Reflection
In regular reflection, all the light that falls on the reflecting surface is reflected in a definite direction.	In irregular reflection, all the light that falls on the reflecting surface is not reflected in a definite direction.
It takes place on a smooth highly polished surface.	It takes place on a rough and uneven surface.

21. What is Rectilinear Propagation of Light?

Ans. Line travels in a straight line. The property of light travelling in a straight line is called rectilinear propagation of light.

22. What is the working principle of a Periscope?

Ans. In a periscope, light from an object strikes the top mirror at 45° and bounces off at the same angle. This sends light directly down the tube and onto the lower mirror. This mirror, also at a 45° angle, reflects light directly to your eye.

23. Why multiple images are formed by using two plain mirrors?

Ans. When two mirrors are inclined at an angle θ, then not only two images are formed in the two mirrors by a single reflection, but also additional images of these images are formed.

24. What happen when two mirrors are placed perpendicular to each other?

Ans. If you place two mirrors at an angle, rather than one multiple images are formed. This is because the image formed in the first mirror acts as the object for the second mirror.

In this case, if you place the mirrors at right angle (90°), Then the formula (360/n)-1 is used,

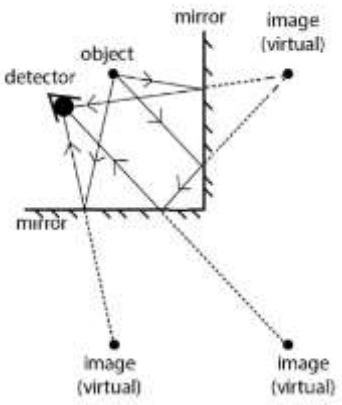
where n is the angle between the mirror.

Here, n= 90. So,

(360/90)–1

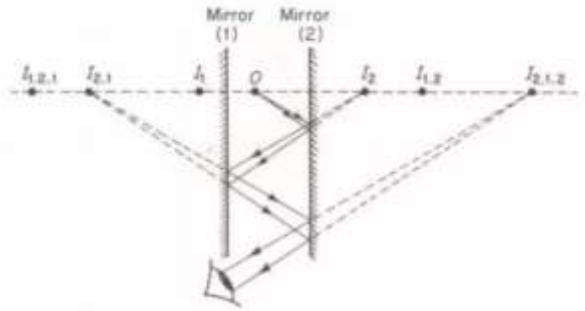
=4–1 = 3.

Therefore, 3 images will be formed.



25. What happen when two mirrors are placed parallel to each other?

Ans. When an object placed is placed between two parallel plane mirrors, infinite images are formed as shown in the ray diagram.



Because

Angle between mirrors = θ=0

Hence,

Number of images formed

= (360/0)

= ∞

So, case of parallel mirrors we get infinite images.

26. What are the uses of Plain Mirror?

Ans. Following are the uses of Plain Mirrors

a. Plain Mirrors are used as looking glass
b. Plain mirrors are used for making periscope or Kaleidoscope.
c. Plain mirrors are used by barbers to show the customers the backside during haircut.
d. Plain mirrors are used for providing false dimensions in showcase, displaying jewelry.

27. What is Dispersion of Light?

Ans. The sunlight is reflected to as white light. Splitting of light into its constituent colors is known as Dispersion of Light.

28. What is Cornea?

Ans. This is the front portion of the eye ball. It is made up of a transparent material. The light enters the eye through cornea. It protects the eyes; at the same time it helps in focussing Light.

29. What is Pupil and Iris?

Ans. Iris is situated behind the cornea. It has a hole in the centre known as pupil. It is a dark-coloured muscular diaphragm. The pupil Looks black as no light is reflected from it. Iris controls the amount of light that enters the eyes by adjusting the size of the pupil.

30. What is Eye Lens?

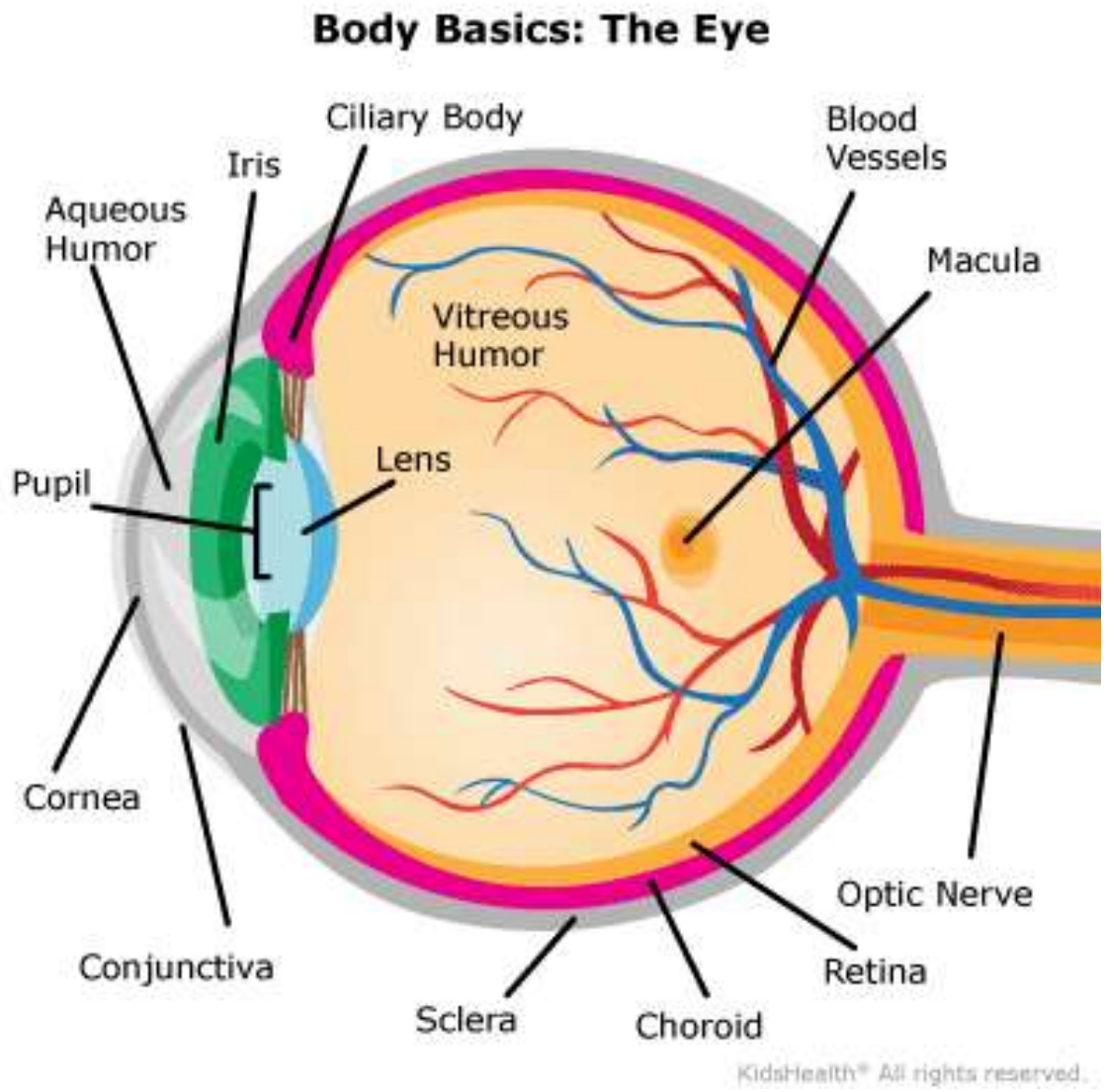
Ans. It is a convex Lens made of a transparent jelly like material. Eye Lens is held in position with the help of ciliary muscles and changes the focal length of the eye lens.

31. What is Aqueous Humour?

Ans. This is a transparent liquid, which fills the region between the cornea and the eye lens. This in fact, is also the part of the eye lens.

32. What is Vitreous Humour?

Ans. It is a jelly-like substance which fills the space between retina and the lens.



33. What is Retina?

Ans. It consists of fine nerve tissue which lines the inside wall of the eyes and act, like the film in the cornea. Its function is to convert light into electrical signals that are later sent down the optic nerve to the brain.

34. What is the working principle of Optic Nerve?

Ans. The optic nerve carries image of objects from the retina to the brain.

35. What is Sclera?

Ans. Sclera is the white part of the human eyes. The purpose of sclera is to provide structure, strength and protection to the eyes.

36. What is Yellow Spot?

Ans. It is the spot located in the centre at the back of the eye. It contains light-sensitive cells, especially the cones. The rest part of the retina (other than central part) has lesser cones and more rods. It helps the eyes to have colour vision and brightest vision with the help of rods and cones.

37. What is Blind Spot?

Ans. It is situated just below the yellow spot. There is no light receptors on the blind spot. That is why the vision does not perceive here. Thus, blind spot is also called the area of no vision.

38. What is Defect of Vision?

Ans. Some people can see objects close to them clearly but cannot see distant objects so clearly. on the other hand, some people cannot see objects close by clearly but they can see distant objects clearly. This abnormalities in the normal vision of the eye are called defects of Vision.

39. **Which are the common defects of vision?**

Ans. The common defects of vision are

a. Myopia or shortsightedness
b. Hypermetropia or longsightedness

40. What is Myopia?

Ans. The person who suffers from Myopia they can see nearby objects clearly, but distant objects appear blurred.

41. What is the cause of Myopia?

Ans. Causes of Myopia is

a. Eye lens becomes too thick.
b. The ciliary muscles do not relax sufficiently to make the eye lens thin when viewing distant objects.

42. **How can we correct Myopia?**

Ans. Spectacles with concave lenses of the required power are used. The concave lens diverges the parallel rays coming from a distant object in such a way that they appear to come from the far point of the objective eye. In other words, the lens forms a virtual image of a far-off object at the far point of the defective eye. The eye then can see the distant object clearly.

43. What is Hypermetropia?

Ans. This is also known as long sightedness.

A person suffering from this defect can see distant objects clearly but nearby objects appear blurred.

44. What is the main cause of Hypermetropia?

Ans. The Cause of this defect are

a. This defect of vision is caused due to the eye lens being too thin.
b. The ciliary muscles are unable to thicken the eye lens enough to see nearby objects clearly. This defects generally occurs in old age when the ciliary muscles become weak.

45. How can we correct Hypermetropia?

Ans. Spectacles with convex lenses of the required power are used. The convex lens converges the rays from a nearby object in such a way that they appear to come from the near point of the defective eye and forms a sharp image of the object on the retina.

46. How can we care our eyes?

Ans. We can care our eyes by the following ways

a. Do not read, write or do any work in dim light or very bright light. This can cause defect to vision.
b. If any injury is caused to your eyes, consult a doctor immediately.
c. Do not read in moving vehicle be ca use eye strained and in the long run can cause serious defects to vision.
d. Wash and clean your eyes with clean cold water at least thrice a day.
e. Avoid working continuously in long stretches if the work requires a close look.
f. Do not play carelessly and avoid playing with pointed and sharp objects, which may damage eyes.
g. If anything, get into eyes, do not rub your eyes. Use clean and cold water to clean eyes.

47. Why are some people visually challenged?

Ans. Sometimes, particularly in old age, the cornea, the eyes lens, the retina or the optic nerve of a person fails to perform its function, the person is unable to see. Such persons are called blind or visually challenged.

48. What is Congenital Blindness?

Ans. In this case the person is blind by birth. It is due to the reason of eye lens becoming opaque before birth. Sometimes, pregnant mother who takes some medicine, which causes this defect in the child in the mother's womb.

49. Why Acquired Blindness can occur?

Ans. The infant born may be healthy with good eyesight but they become blind later on because of one of the following reasons:

a. Retina damage may be caused due to wrong methods of treatment of eye discase.
b. Sometime, due to accident optic nerve can be damaged, which can cause a disease called Glaucoma. This disease is caused because of the increased pressure by the fluid of the eye.
c. Cataract is a disease of eye in which an elderly person's lens becomes cloudy and opaque. This disease can be correctly surgically or by laser and artificial is planed in place of removed defective lens.

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52. What is Braille System?

Ans. The Braille system is a way of writing things. It is named after Louis Braille. It is a method that is widely used by blind people to read and write. Braille designed a coding system, based on patterns of raised dots which the blind could read by touch. Each Braille character or cell is made up of six dot or raised points.

The Braille system consists of 63 possible combinations. It is used in modified form for printing, writing and musical notation for the blind. The present system was adopted in l932, Many Indian languages can be read using the Braille system.