Chapter 12. Light

Very Short Q&A:

Q1: The sense of light is one of the most important _____

Ans: Senses

Q2: Eyes alone cannot see the objects. True/False.

Ans: True

Q3: Define a mirror.

Ans: A mirror is an shiny or polished object that reflects light or sound in a way that preserves much of its original quality subsequent to its contact with the mirror.

Q4: Define light.

Ans: A form of energy that can be detected by the human eye.

Q5: Define incident ray.

Ans: The light ray which strikes any surface is called the incident ray.

Q6: Which mirror used is used in vehicles?

a. **Plain mirror**
b. **concave mirror**
c. **Convex mirror**
d. **none of the above**

Ans: Convex mirror.

Q7: Which property of light is responsible for the occurrence of Rainbows

a. **Reflection**
b. **Refraction**
c. **Radiation**
d. **rectilinear propagation of light.**

Ans: Refraction

Q8: Define reflected ray.

Ans: The ray which comes back from the surface after reflection is called reflected ray.

Q9: Define angle of incidence.

Ans: Angle of incidence is a measure of deviation of something from "straight on".

Q10: The angle between normal and incident rays is called the _____.

Ans: angle of incidence.

Q11: The angle between normal and reflected rays is called the _____.

Ans: angle of reflection.

Q12: Define angle of reflection.

Ans: The angle between normal and reflected rays is called angle of reflection.

Q13: The angle of incidence is always equal to _____.

Ans: angle of reflection

Q14: What is the first law of reflection?

Ans: The angle of incidence is always equal to angle of reflection

Q15: What is the second law of reflection?

Ans: Incident rays, reflected rays and normal rays drawn at the point of incidence to the reflecting surface lies in the same plane

Q16: Mita is in front of a plane mirror, in the image formed by mirror her left hand will appear on the_____.

Ans: Right

Q17: Define lateral inversion.

Ans: In an image formed by mirror left of the object appears on the right and the right appears on the left, this property of mirror is called lateral inversion.

Q18: Name the two types of reflection.

Ans: Regular and irregular reflection.

Q19: Define irregular reflection.

Ans: Reflection that place from rough surfaces is called irregular reflection.

Q20: Define regular reflection.

Ans: Regular reflection takes place when light is incident on smooth, polished and regular surfaces.

Q21: What is the colour of sunlight in actual?

Ans: White

Q22: Splitting of light into its colours is called _____.

Ans: dispersion of light

Q23: Give an example of dispersion of light.

Ans: Rainbow

Q24: _____ is the natural phenomenon showing dispersion.

Ans: Rainbow

Q25: Name the dark muscular part of eyes behind the cornea.

Ans: Iris

Q26: Name the small opening in the iris.

Ans: Pupil

Q27: Name the part of eyes which gives it its distinctive colour.

Ans: Iris.

Q28: The _____ controls the amount of light entering the eyes.

Ans: Iris

Q29: In which case do you need to allow more light in the eye, when the light is dim or bright?

Ans: Dim

Q30: The lens of the eyes focuses light on_____.

Ans: Retina

Q31: Name the nerve which helps in the sense of vision.

Ans: Optic nerve

Q32: Which of these form virtual image only?

a. **Concave mirror**
b. **Concave mirror**
c. **Concave lens**
d. **Convex lens**

Ans: Convex mirror

Q33: What kind of Image is formed by a concave mirror?

a. **Virtual image**
b. **Real image**
c. **Sometimes real sometimes virtual**
d. **None of the above**

Ans: Sometimes real sometimes virtual

Q34: Cones are sensitive to dark light. True/False.

Ans: False

Q35: At which part of eyes there is no sense of vision?

Ans: At the junction of optic nerve and the retina there is no sensory cells, so there is no sense of vision.

Q36: Visually challenged persons can read and write by using _____.

Ans: Braille system.

Q37: Too little or too much light is good for eyes. True/False

Ans: False

Q38: Which property of light helps in formation of shadows

a. **Reflection**
b. **Refraction**
c. **Radiation**
d. **Rectilinear propagation of light**

Ans: Rectilinear propagation of light

Q39: The size of the pupil becomes _____ when we see in dim light.

Ans: Large

Q40: Angle of incidence is equal to the angle of reflection

a. **Under special conditions**
b. **Sometimes**
c. **Never**
d. **Always**

Ans: Always

Short Q&A:

Q1: Define light .Discuss its importance.

Ans: Light is an electromagnetic radiation that is visible to the human eye, and is responsible for the sense of sight. Visible light has a wavelength in the range of about 380 nanometres to about 740 nm between the invisible infrared.

Q2: Why we are not able to see any object in the dark?

Ans: We can see any object when light reflected by that object reaches our eyes, but in dark room no light is reflected by the object thus we are not able to see in the dark.

Q3: Why the image formed by concave mirror is sometimes real, while sometimes virtual?

Ans: In case of concave mirror the image depends upon the distance of the object from the mirror. If the object is beyond the focus then real image is formed and if the object is closer than the focus then virtual image is formed

Q4: Why convex mirrors are used in vehicles?

Ans: Convex mirrors are used in vehicles because the image formed by convex mirror is always erect and smaller in size.

Q5: Explain the two laws of reflection.

Ans: There are two laws of reflection: the angle of incidence is equal to the angle of reflection and incident rays, reflected rays and normal rays drawn at the point of incidence to the reflecting surface lies in the

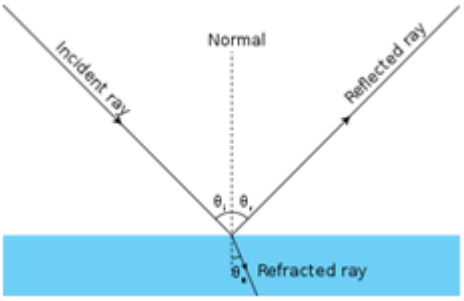
same plane.

Q6: Define the following;

a. **Incident ray**
b. **Reflected ray**

Ans:

a. Incident ray: The ray of light which strikes any surface is called the incident ray.
b. Reflected ray: The ray which comes back from the surface after reflection is called reflected ray.

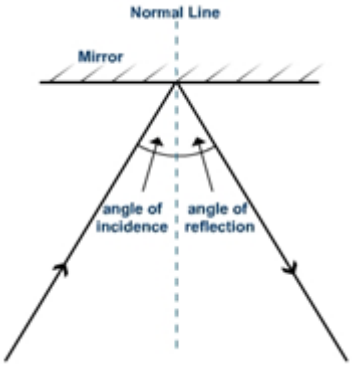


Q7: Define the following:

a. **Angle of incidence**
b. **Angle of reflection.**

Ans:

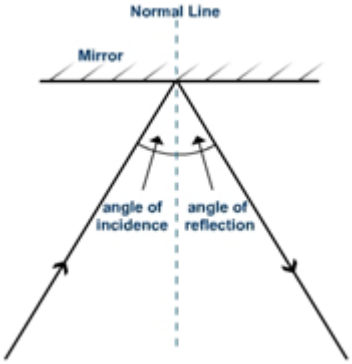
a. Angle of incidence: Angle of incidence is a measure of deviation of something from "straight on". Angle of incidence is always equal to angle of reflection.
b. Angle of reflection: The angle between normal and reflected rays is called angle of reflection.



Q8: Draw a diagram showing angle of incidence and angle of reflection.

Ans:

a. Angle of incidence: Angle of incidence is a measure of deviation of something from "straight on". Angle of incidence is always equal to angle of reflection.
b. Angle of reflection: The angle between normal and reflected rays is called angle of reflection.



Q9: What kind of image is formed by a plane mirror?

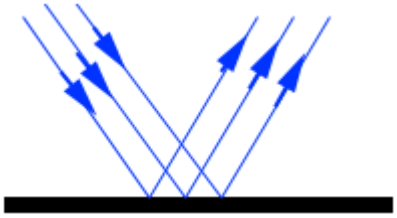
Ans: Image formed by plane mirror is virtual, upright and of the same shape and size as of the object.

Q10: What do you mean by lateral inversion?

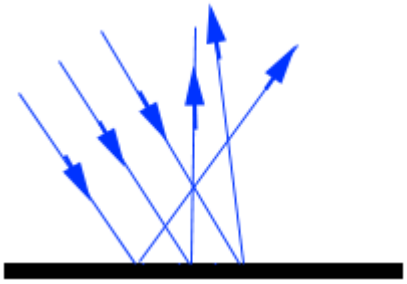
Ans: Lateral inversion is the reversal experienced by the image formed in a flat mirror. Although the image is the correct way up, its left and right sides are transposed.

Q11: Explain regular and irregular reflection via a diagram.

Ans: When a beam pass of parallel light rays is incident on a smooth and plane surface, the reflected rays will also be parallel. This type of reflection is called Regular Reflection.



When a beam of parallel light rays is scattered in all directions. Thus, the parallel rays incident on the surface will reflect in different directions. This type of reflection is called "Irregular or Diffuse Reflection".



Q12: "Reflected light can be reflected again", give an example to justify this statement.

Ans: Sit in front of a mirror, tell your friend to hold a mirror behind you to see your hair cut, your hair image will be shown in the mirror in front of you, this is the best example of reflected light can be reflected again.

Q13: Name the seven colours of rainbow.

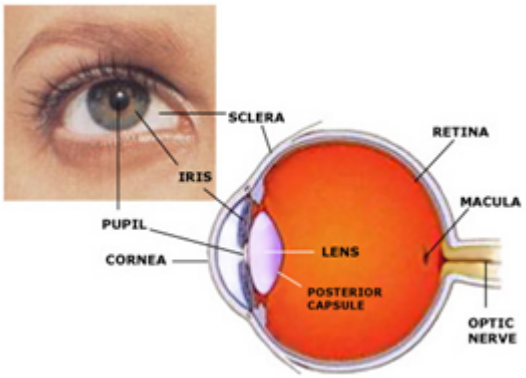
Ans: Seven colours of rainbow:

Red Orange Yellow Green Blue Indigo Violet

The seven primary colours

Q14: Draw a diagram showing structure of human eye.

Ans:



Q15: Explain all parts of a human eye.

Ans: The eye has roughly spherical surface. The outer coat of eyes is white and tough to protect the interior of eyes from any kind of accident. Its transparent front part is called cornea, behind the cornea there is a dark muscular structure called iris. In the iris there is small opening called pupil. The size of the pupil is controlled by the iris, the iris control the amount of light entering into the eye.

Q16: Explain the function of retina of eyes.

Ans: The lens focuses light on the retina which contains several nerve cells. Sensations felt by the nerve cells are then transmitted to brain through the optic nerve.

Q17: Why blind spot is named so?

Ans: At the junction of the optic nerve and the retina, there are no sensory cells, so there is no possibility of vision at that spot, thus it is called blind spot.

Q18: What is the function of eyelids?

Ans: Eyelids prevent any object from entering the eye, eyelids also shut out light when not required.

Q19: What is myopia? How it can be corrected?

Ans: Myopia is a vision condition in which close objects are seen clearly, but objects farther away appear blurred. Most commonly myopia can be corrected through the use of corrective lenses, such as glasses or contact lenses. It may also be corrected by refractive surgery, though there are cases of associated side effects. The corrective lenses have a negative optical power (i.e. are concave) .

Q20: What is hyper myopia? How it can be corrected?

Ans: Hypermetropia means long sight and is where the image of a nearby object is formed behind the retina. This could be because the eye is too short, or the cornea or crystalline lens does not refract the light enough. A hypermetropic person may have blurred vision when looking at objects close to them, and

clearer vision when looking at objects in the distance. By placing a convex (plus powered) lens in front of a hypermetropic eye, the image is moved forward and focuses correctly on the retina.

Q21: Why eyesight becomes foggy in old age?

Ans: In old age eyes eye lens becomes cloudy, and person develops a cataract that is loss of vision. This defect can be treated by replacing opaque lens with a new artificial lens.

Q22: How cataract disorder can be corrected?

Ans: In old age eyes eye lens becomes cloudy, and person develops a cataract that is loss of vision. This defect can be treated by replacing opaque lens with a new artificial lens.

Q23: Give some possible measures to take care of the eyes.

Ans:

- If advised use suitable spectacles
- avoid too much or too little eyes
- do not look at the sun or a powerful light directly
- never rub your eyes
- wash your eyes properly and frequently with water
- Always read at the normal distance for vision.

Q24: What is the braille system?

Ans: Braille is a writing system which enables blind and partially sighted people to read and write through touch. It was invented by Louis Braille.

Q25: Why owl can see very well in the night but not during the day like other animals?

Ans: The owl has a large cornea and a large pupil to allow more light into the eye. It has large number of rods on its retina and few cones that enables it to see properly in dim light or in dark.

Q26: Differentiate between regular and irregular reflection. Does irregular reflection mean the failure of the laws of reflection?

Ans:

Regular reflection	Diffused reflection
1. It takes place from a smooth or regular surface 2. Here all reflected rays are parallel to each other 3. Reflected rays go in one direction.	1. It takes place from a rough surface 2. Here all reflected rays are not parallel to each other 3. Reflected rays are scattered in different direction.

In diffused reflection each ray obeys the law of reflection, thus there is no failure of law of reflection.

Q27: Mention whether diffused or regular reflection will take place when :

a. **A beam of light strikes a mirror**
b. **A beam of light strikes a cardboard surface.**
c. **A beam of light strikes a piece of paper. To the incident ray**

Ans:

a. regular reflection because mirror has smooth surface
b. diffused reflection because cardboard has irregular surface.

c. diffused reflection, because a piece of paper appears smooth but it has lot of minor irregularities.

Q28: Give an important characteristic of a normal eye.

Ans: Normal eye can clearly see distant objects as well as object nearby.

Long Q&A:

Q1: Can you say what will be the angle of incidence of a ray if the reflected ray is at an angle of 90 degree?

Ans: From the law of reflection we know that angle of incidence = angle of reflection

$$\angle i + \angle r = 90^\circ$$
$$\angle i = \angle = 90/2$$
$$= 45^\circ$$

Thus angle of incidence equals to 45 degree.

Q2: How many images of a mobile will be formed if it is placed between two parallel plane mirrors separated by 30 cm?

Ans: Infinite number of image will be formed if it is placed between two parallel plane mirrors .