

Light

1. Which one of the following statements is true?
 - (a) A plane mirror sometimes forms an inverted image.
 - (b) A concave mirror always forms a virtual, erect and diminished image.
 - (c) A concave lens always forms a virtual, erect and diminished image.
 - (d) All of the above
2. Which of the following is used for splitting sunlight into seven colours?
 - (a) A prism
 - (b) A plane mirror
 - (c) A concave mirror
 - (d) A convex lens
3. Which of the following is a natural source of light?
 - (a) Electric lamp
 - (b) Tube light
 - (c) Torch
 - (d) The sun
4. What is the nature of the propagation of light?
 - (a) Curvilinear
 - (b) Rectilinear
 - (c) Random
 - (d) Circular
5. What is rectilinear propagation of light?
 - (a) Travelling in curved lines
 - (b) Travelling in straight lines
 - (c) The ability to bend around obstacles
 - (d) The display of the phenomenon of diffraction
6. What is called a source of light?
 - (a) An object that can absorb light
 - (b) An object that can reflect light
 - (c) An object that can refract light
 - (d) An object that can emit light
7. Which of the following is a reflector of light?
 - (a) The sun
 - (b) The moon
 - (c) The star
 - (d) The filament
8. What causes the formation of shadows?
 - (a) Rectilinear propagation of light
 - (b) Curvilinear propagation of light
 - (c) Total internal reflection
 - (d) Refraction
9. A Identify the nature of light emitted from a torchlight.
 - (a) Convergent
 - (b) Divergent
 - (c) Parallel
 - (d) Irregular
10. What is a stream of light called?
 - (a) Ray
 - (b) Beam
 - (c) Twilight
 - (d) Sunlight
11. A ray of light is incident on a plane mirror at an angle of incidence of 30° . What is the angle of reflection?
 - (a) 30°
 - (b) 60°
 - (c) 90°
 - (d) 120°

- 12.** How many colours is white light made up of?
(a) A single colour
(b) Primary colours
(c) Five colours
(d) Seven colours
- 13.** Why can't we see anything in a dark room?
(a) Everything is black in colour.
(b) Our eyes do not work in darkness.
(c) No light reaches our eyes.
(d) All the light gets scattered.
- 14.** Which of these surfaces cannot produce clear images?
(a) Rough surface
(b) Ideal surface
(c) Smooth surface
(d) Curved surface
- 15.** What enables us to see objects?
(a) Light absorbed by an object
(b) Light that enters our eyes after it is reflected by an object
(c) Light dispersed by an object
(d) Light refracted through the object
- 16.** If the angle of incidence is 80° , what will be the angle of reflection with respect to the normal drawn perpendicular at the point of reflection?
(a) 80°
(b) 100°
(c) 160°
(d) 20°
- 17.** Which of the following is used by an E.N.T. doctor?
(a) Convex mirror
(b) Convex lens
(c) Plane mirror
(d) Concave mirror
- 18.** If the angle of incidence is 50° , what is the angle between the incident ray and the reflected ray?
(a) 50°
(b) 100°
(c) 130°
(d) 80°
- 19.** Which of the following are used in projectors?
(a) Concave lens
(b) Convex mirrors
(c) Plane mirrors
(d) Convex lenses
- 20.** Which of the following are used as reflectors in torchlights?
(a) Concave mirrors
(b) Plane mirrors
(c) Convex mirrors
(d) Concave lens

- 21.** To prevent the mirror from getting scratched, which colour is painted at the back of the mirror?
- (a) Red
 - (b) Yellow
 - (c) Blue
 - (d) Green
- 22.** What kind of an image is always produced by a convex mirror?
- (a) An erect, virtual and diminished image
 - (b) An erect, real and diminished image
 - (c) An erect, real and enlarged image
 - (d) A virtual, erect and enlarged image
- 23.** Which of the following can form enlarged, virtual images?
- (a) Convex mirrors
 - (b) Concave mirrors
 - (c) Plane mirrors
 - (d) Concave lens
- 24.** What is a spherical mirror?
- (a) A reflecting, elliptical surface
 - (b) A reflecting, spherical surface
 - (c) A reflecting, parabolic surface
 - (d) A flat, reflecting surface
- 25.** What is a real image?
- (a) It cannot be captured on a screen.
 - (b) It can be captured on a screen.
 - (c) It can be captured only on a celluloid screen.
 - (d) It is always magnified.
- 26.** Which of the following produces a virtual image for any position of the object?
- (a) Convex lens
 - (b) Pinhole camera
 - (c) Concave mirror
 - (d) Convex mirror
- 27.** What happens during lateral inversion?
- (a) The right of the object will be on the right side of the image.
 - (b) The left side of the object will be on the left side of the image.
 - (c) The upper part of the object will be at the bottom of the object.
 - (d) The right side of the object will be on the left side of the image.
- 28.** A reflecting surface is curved outwards, which of the following mirrors is it likely to be?
- (a) Concave
 - (b) Plane
 - (c) Convex
 - (d) All of the above
- 29.** Why are convex mirrors used by drivers as rear view mirrors in vehicles?
- (a) They reflect light better than other mirrors.
 - (b) They produce images which are clearer than those produced by others
 - (c) They produce magnified images.
 - (d) They give a wide field of view.

- 30.** Why are images inverted in a pinhole camera?
 (a) Light travels in straight lines.
 (b) Images are always inverted.
 (c) Image gets inverted when the light travels through a hole.
 (d) There is no specific reason.
- 31.** An object placed 3 m from a plane mirror is shifted by 0.4 m away from the mirror. What is the new distance between the object and its image?
 (a) 6.4 m
 (b) 6.8 m
 (c) 6 m
 (d) 5.2 m
- 32.** Which of the following is NOT a characteristic feature of a convex mirror?
 (a) The image lies between the pole and focus.
 (b) The image is diminished in size.
 (c) The image is erect.
 (d) The image is real.
- 33.** The figure given below shows an image produced by an object placed in front of a plane mirror.



Which is the object from among the following?

- (a)
- (b)
- (c)
- (d)

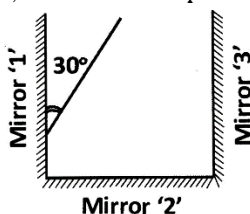
- 34.** Why is a spectrum of seven colours formed when sunlight passes through a prism?
 (a) White light is a mixture of seven colours.
 (b) The different colours of light is reflected at different angles in a glass prism.
 (c) The prism adds colour to the white sunlight.
 (d) Light travels at high speed.
- 35.** Rahul told his friend that 'X' can form a virtual image larger than the object by reflection. What is 'X'?
 (a) Plane mirror
 (b) Convex mirror
 (c) Concave mirror
 (d) Concave lens

36. The image produced by Q is real. Identify Q from the following.
- Plane mirror
 - Convex lens
 - Concave lens
 - Convex mirror
37. How many letters in the English alphabets have the image formed in a plane mirror appear exactly like the letter itself?
- 4
 - 8
 - 9
 - 11

38. A Match the entries given in Column-I with those in Column-II.

	Column I		Column II
a.	Plane mirror	1.	Used as a magnifying glass
b.	Convex mirror	2.	Can form images of objects spread over a large area
c.	Convex lens	3.	Used by dentists to see enlarged images of teeth
d.	Concave mirror	4.	1 mage is erect and of the same size as the object
e.	Concave lens	5.	The image is erect and smaller than the object

- a - 4, b - 5, c - 3, d - 1, e - 2
 - a - 4, b - 5, c - 1, d - 3, e - 2
 - a - 4, b - 3, c - 2, d - 5, e - 1
 - a - 4, b - 1, c - 3, d - 2, e - 5
39. Mirrors '1, '2' and '3' are placed at right angles as shown below and a beam of light is made incident on mirror T.



What will be the angle of reflection from mirror 3?

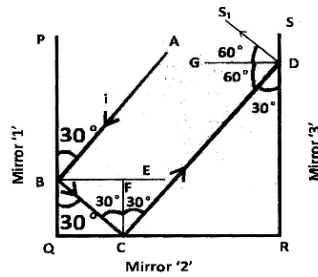
- 30°
 - 45°
 - 60°
 - The reflected ray from mirror '2' will be parallel to the surface of mirror '3'
40. Which of the following letters will be seen without any change in a plane mirror?
- S
 - T
 - L
 - P

Answers With Solutions

1. (c) (i) A concave lens always forms a virtual, erect, and diminished image.
(ii) A plane mirror always forms a virtual, erect image of the same size as that of the object.
(iii) A concave mirror forms a virtual, erect and magnified image.
2. (a) A prism is used for splitting sunlight into seven colours.
3. (d) The sun is a natural source of light.
4. (b) Light travels in a straight line. This property of light travelling in a straight line is called rectilinear propagation of light.
5. (b) Rectilinear propagation of light is a mode by which light travels in straight lines.
6. (d) An object which emits light is a source of light.
7. (b) Moon does not emit any light of its own. When sunlight falls on the moon, it is reflected and appears as moonlight for the people on the earth.
8. (a) Light rays cannot pass through opaque bodies. The light rays cannot bend around to the other side of the body. Hence, a shadow of the opaque body is formed.
9. (b) Since, the light beam emanating from a torch appears to be starting from a point and travels in various directions, it is said to be a divergent beam of light.
10. (b) A collection of a large number of rays of light is called a beam of light.
11. (a) Give $\angle i = 30^\circ$
 $\angle r = 30^\circ (\because \angle i = \angle r)$
12. (d) White light consists of seven colours violet, indigo, blue, green, yellow, orange and red.
13. (c) Objects are visible only when light reflected from them reaches the retina of our eyes. As there is no light in the dark room, no light reaches our eyes and we cannot see any object inside a dark room.

- 14.** (a) When light is incident on a rough surface, irregular reflection takes place. Hence/the image formed is not clear.
- 15.** (b) The object is visible to us when light reflected from the object reaches the retina of our eyes.
- 16.** (a) According to the laws of reflection, the angle of reflection is equal to the angle of incidence.
 $\angle i = \angle r = 80^\circ$
- 17.** (d) E.N.T. doctors use a concave mirror to focus light on the internal parts of ear, nose and throat for proper examination.
- 18.** (b) According to the laws of reflection, the angle of incidence is equal to the angle of reflection.
The angle between the incident and reflected ray ($\angle i = \angle r = 50^\circ$)
 $= 50^\circ + 50^\circ = 100^\circ$
- 19.** (a) Concave lenses are used in projectors.
- 20.** (a) Concave mirrors are used as reflectors in torches, room heaters, etc.
- 21.** (a) The backside of the mirror is painted with red paint to prevent the silver coating on the mirror from getting scratched.
- 22.** (a) A convex mirror always forms an erect, virtual and diminished image of the object.
- 23.** (b) Enlarged and virtual images can be formed by concave mirrors.
- 24.** (b) The portion of a reflecting surface, which forms part of a sphere is called a spherical mirror.
If a small portion of the hollow. Glass sphere is cut along a plane and silvered on one side, it serves as a spherical mirror.
- 25.** (b) A real image is the image that can be caught on the screen by the actual meeting of reflected rays on the screen.
- 26.** (d) Irrespective of the position of the object, a convex mirror always forms a virtual, erect and diminished image of the object.
- 27.** (d) In lateral inversion, the right side of the object will be on the left side of the image.

- 28.** (c) When the reflecting surface is curved outwards, the mirror is convex.
- 29.** (d) A driver uses a convex mirror as rear view mirror because of two reasons:
 (i) A convex mirror always produces an erect image of the objects.
 (ii) The image formed in a convex mirror is highly diminished or much smaller than the object, due to which a convex mirror gives a wide field of view.
- 30.** (a) Pinhole camera works on the principle of rectilinear propagation of light and the images formed in it are inverted.
- 31.** (b) Distance between the object and its image
 $= (3.4 + 3.4)m = 6.8\text{ m}$
- 32.** (d) Image formed by a convex mirror is erect, virtual and diminished.
- 33.** (b) The image produced by the given object is:
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- 34.** (b) A spectrum of seven colours is formed when the sunlight passes through the prism as the coloured light reflects at different angles in a glass prism.
- 35.** (c) A concave mirror forms a virtual, erect and magnified image when the object is placed very close to the mirror.
- 36.** (b) The image produced by Q is real as Q is a convex lens.
- 37.** (d) A, H, I, M, O, T, U, V, W, X, Y
 All these letters look similar when viewed through a plane mirror.
- 38.** (b) The correct combination is
 A - 4, b - 5, c - 1, d - 3, e - 2
- 39.** (c)



$$\angle ABP = \angle QBC = 30^\circ$$

$$\angle BCF = \angle FCD = 30^\circ$$

$$\therefore \angle CDR = 30^\circ$$

\therefore Angle of incidence on mirror 3,

$$\angle CDG = 60^\circ$$

As per the laws of reflection $\angle i = \angle r$

$$\therefore \text{Angle of reflection } \angle GDS' = 60^\circ$$

- 40.** (b) The letter T is laterally symmetrical and hence its image in a plane mirror would be the same as itself.