

# Reflection of light



# EXERCISE

**Multiple Choice Questions** 

**1.** The number of images observable between two parallel mirrors is

(a) 6	(b) infinite
(c) 2	(d) 4

The number of images formed by two plane mirrors inclined at an angle 60° of an object placed symmetrically between mirrors is

 (a) 5
 (b) infinite

(c) 6 (d) 7

- **3.** How many images of himself does an observer see if two adjacent walls and the ceiling of a rectangular room are mirror surfaced?
  - (a) 6 (b) 7
  - (c) 3 (d) 5
- A thick plane mirror shows a number of images of the filament of an electric bulb. of these, the brightest image is the
  (a) last
  (b) fourth
  (c) first
  (d) second
- 5. A light bulb is placed midway between two plane mirrors inclined at an angle of 40°. The number of images formed are

(a) 5	(b) 4
(c) 6	(d) 8

- 6. Choose the wrong statement.
  - (a) A concave mirror can form a magnified real image.

(b) A concave mirror can form a magnified virtual image.

(c) A convex mirror can form a diminished virtual image.

(d) A convex mirror can form a diminished real image.

- 7. A man 180 cm high stands in front of a plane mirror. His eyes are at a height of 172 cm from the floor. Then to see his full image for minimum length of mirror, the lower end of the mirror should be placed at a height of (a) 86 cm from the floor
  - (b) 94 cm from the floor
  - (c) 4 cm from the floor
  - (d) 8 cm from the floor

- 8. A man standing on the road in front of a large window glass pane sees his image bigger than himself. The glass pane is
  (a) convex outside
  (b) cylindrical outside
  (c) Plane
  (d) concave outside
- **9.** It is desired to photograph the image of an object placed at a distance of 3 m from a plane mirror. The camera, which is at a distance of 4.5 m from the mirror should be focused for a distance of

(a) 6m	(b) 7.5 m
(c) 3m	(d) 4.5m

**10.** An object 5 cm long and a pencil 10 cm long are placed in front of a pin hole camera such that their images have the same length. The ratio of the distance of the object from the pin hole to that of the pencil is

(a) 5 : 2	(b) 1: 4

- (c) 3:2 (d) 1:2 A plane mirror reflecting a ray of incident light
- **11.** A plane mirror reflecting a ray of incident light is rotated through an angle 9 about an axis through the point of incidence in the plane of the mirror perpendicular to the plane of incidence. Then
  - (1) the reflected ray does not rotate
  - (2) the reflected ray rotates through an angle  $\theta$
  - (3) the reflected ray rotates through an angle  $2\theta$

(4) the incident ray is fixed Of the above statements

- (a) (3) and (4) are correct
- (b) and (4) are correct
- (c) Only (1) is correct
- (d) and (3) are correct
- **12.** Given a point source of light, which of the following can produce a parallel beam of light?
  - (a) Concave lens

(b) Two plane mirrors inclined at 90° to each other

- (c) Convex mirror (d) Concave mirror
- **13.** A ray of light is incident on a plane mirror at an angle of incidence of 30°. The deviation produced by the mirror is
  - (a) 90° (b) 120°
  - (c) 30° (d) 60°

- **14.** An object is photographed when placed at a distance of 2 m from the camera. If the same object be placed at a distance of 4 m from the camera, how will the time of exposure be affected?
  - (a) It will be increased four times.
  - (b) It will be decreased four times.
  - (c) It will be decreased two times.
  - (d) It will be increased two times.
- 15. A convex mirror is used to form an image of a real object. Then the incorrect statement is(a) the image is erect(b) the image is real(c) the image lies between the pole and the focus.
  - (d) the image is diminished in size
- **16.** A plane mirror is approaching you at  $10 \text{ cm s}^{-1}$ . You can see your image in it. At what speed will your image approach you
  - (a)  $20 \text{ cm } s^{-1}$  (b)  $15 \text{ cm } s^{-1}$
  - (c)  $10 \text{ cm } s^{-1}$  (d)  $5 \text{ cm } s^{-1}$
- **17.** A virtual image, larger than the object can be produced by
  - (a) plane mirror (b) concave lens
  - (c) convex mirror (d) concave mirror
- **18.** For a real object, a convex mirror always forms an image which is
  - (a) virtual and erect
  - (b) real and magnified
  - (c) real and inverted
  - (d) virtual and inverted
- **19.** The image formed by a pin hole camera is sharpest when the
  - (a) camera is used in a dark room
  - (b) hole is very small
  - (c) object is brightly illuminated
  - (d) distance from the pin hole to the object is small
- **20.** The image of an object placed on the principal axis of a concave mirror of focal length 12 cm is formed at a point which is 10 cm more distant from the mirror than the object. The magnification of the image is
  - (a) 2 (b) 1.5 (c)  $\frac{8}{3}$  (d) 2.5
- **21.** It is necessary to illuminate the bottom of a well by reflected solar beam when the light is

incident at an angle of  $\alpha = 40^{\circ}$  to the vertical. At what angle  $\beta$  to the horizontal should a plane mirror be placed?

(a) 50° (b) 40°

(c) 70° (d) 20°

- 22. A concave spherical mirror forms a 40 cm high real image of an object whose height is 10 cm. The radius of the mirror is 60 cm. Find the distance from the object to its image.
  - (a) 90 cm (b) 112.5 cm

23. A short linear object of length b lies along the axis of a concave mirror of focal length f at a "distance u from the pole of the mirror. The size of the image approximately is equal to

(a) 
$$b\left(\frac{u-f}{f}\right)$$
 (b)  $b\left(\frac{f}{u-f}\right)^2$   
(c)  $b\left(\frac{u-f}{f}\right)^{\frac{1}{2}}$  (d)  $b\left(\frac{f}{u-f}\right)^{\frac{1}{2}}$ 

24. When a plane mirror is placed horizontally on level ground at a distance of 60 m from the foot of a tower, the top of the tower and its image in the mirror subtend an angle of 90° at the eye. The height of the tower is

- **25.** A clock hung on a wall has marks instead of numbers on its dial. On the opposite wall there is a mirror and the image of the clock in the mirror when read gives time as 3:25. Then the time on the clock is
  - (a) 6 : 55 (b) 3 : 25 (c) 7:35 (d) 8 :35
- **26.** In a concave mirror an object is placed at a distance *x* from the focus, and the image is formed at a distance *y* from the focus. The focal length of the mirror is

(a) 
$$\frac{x+y}{2}$$
 (b)  $\sqrt{\frac{x}{y}}$   
(c)  $xy$  (d)  $\sqrt{xy}$ 

- 27. An object 20 cm from a spherical mirror give rise to a virtual image 15 cm behind the mirror. The type of the mirror and its focal length is
  - (a) concave, 8.5 cm (b) convex, 30 cm
  - (c) concave, 60 cm (d) convex, 60 cm

**28.** A candle flame 3 cm high is placed at a distance of 3 m from a wall. How far from the wall must a concave mirror be placed in order that it may form an image of the flame 9 cm high on the wall?

(a) 450 cm	(b) 150 cm
(c) 225 cm	(d) 300 cm

- **29.** In the above question, the radius of curvature of the mirror is
  - (a) 125 cm (b) 150 cm
  - (c) 450 cm (d) 225 cm
- **30.** An object 4 cm high is placed at a distance of 15 cm in front of a convex mirror having a radius of curvature of 10 cm. Then the image formed is at a distance of
  - (a) 7.5 cm behind the mirror
  - (b) 3.75 cm in front of the mirror
  - (c) 7.5 cm in front of mirror
  - (d) 3.75 cm behind the mirror
- **31.** At what distance from a concave mirror of focal length 10 cm must an object be placed in order that an image double its size may be obtained?
  - (a) Either 5 cm or 15 cm
  - (b) At 10 cm
  - (c) 5cm
  - (d) 15 cm only
- **32.** A convex mirror has a focal length 15 cm. A real object placed at a distance 15 cm in front of it from the pole, produces an image at

(a) 7.5 cm	(b) 30 cm
()	

- (c) infinity (d) 15cm
- **33.** When a convergent beam of light falls incident on a plane mirror, the image formed is
  - (a) inverted and real
  - (b) inverted and virtual
  - (c) erect and real
  - (d) erect and virtual
- **34.** A man stands in the centre of a room. A plane mirror is fixed on the wall in front of him. What should be the smallest length of the mirror so as to enable him to see full image of the back wall?
  - (a) One half of the height of the wall.
  - (b) One sixth of the height of the wall.
  - (c) One fourth of the height of the wall.
  - (d) One third of the height of the wall.

- **35.** A person standing in front of a mirror finds his image thinner but with normal height. This implies that the mirror is
  - (a) convex and cylindrical with axis vertical
  - (b) convex and cylindrical with axis horizontal
  - (c) convex and spherical
  - (d) concave and spherical
- **36.** A person standing in front of a mirror finds his image larger than himself. This implies that the mirror is (a) concave
  - (b) cylindrical with bulging side outwards
  - (c) plane (d) convex
- **37.** A man 180 cm tall stands 4.5 metre in front of a large vertical plane mirror. Then the angle subtended at the eye by his image in the plane mirror is
  - (a) 0.2 radians (b) 0.4 radians
  - (c) 0.2 degrees (d) 0.4 degrees
- **38.** A ray reflected successively from two plane mirrors inclined at a certain angle undergoes a deviation of 240°. Then the number of images observable is

(a) 7	(b) 9
(c) 3	(d) 5

**39.** In a pinhole camera, the effect of doubling the diameter of the hole from 0.5 mm to 1.0 mm is to

(a) increase the blurring of the image caused by diffraction

(b) cut the necessary exposure time to one fourth of its previous value

(c) double the magnification of the image

(d) worsen the chromatic aberration of the image

- **40.** The sun subtends an angle of half a degree at the pole of a concave mirror which has a radius of curvature of 15 m. Then the size (diameter) of the image of the sun formed by the concave mirror is
  - (a) 3.5cm (b) 13.1cm (c) 7.5cm (d) 6.55cm
- **41.** A convex and a concave mirror of radii 10 cm each are facing each other and 15 cm apart. A point object is placed midway between them. Then the position of the final image if the reflection first takes place at the concave mirror and then in the convex mirror is (a) coincident with the object itself.

- (b) 5 cm behind the convex mirror.
- (c) at the pole of the concave mirror.
- (d) at the pole of the convex mirror.
- 42. An object is placed 18 cm away from a concave mirror whose focal length is 10 cm. Then the size of area of the image if the object be 4 mm broad and 12 mm long is (a) 0.75cm<sup>2</sup> (b) 2cm<sup>2</sup> (c) 1.5cm<sup>2</sup> (d) 0.5 cm<sup>2</sup>
- **43.** An object is at a distance of 10 cm from a mirror and the image of the object is at a distance of 30 cms from the mirror on the same side as the object. Then the nature of the mirror and its focal length is

(a) convex, 15 cm (b) concave 1.5 cm

44. At what distance will the image of an object be obtained in a convex spherical mirror with radius of curvature 40 cm if the object is placed at 30 cm from the mirror?
(a) 12 cm
(b) 9 cm

(c) 6 cm (d) 18 cm

**45.** A real image of half the size is obtained in a concave spherical mirror with a radius of curvature of 40 cm. The distance of the object and that of its image will be

(a) 5 15 cm, 30 cm (b) 30 cm, 15 cm (c) 30 cm, 60 cm (d) 60 cm, 30 cm

46. The image of an object in a concave spherical mirror is twice the size of the object. The distance between the object and image is 15 cm. Then the focal length of the mirror is (a) 15 cm (b) 20 cm

	. ,
(c) 5cm	(d) 10cm

**47.** A ray of light makes an angle of 10° with the horizontal and strikes a plane mirror which is inclined at an angle to the horizontal. The angle *r* for which reflected ray becomes vertical, is

(a) 80°	(b) 100°
(c) 40°	(d) 50°

**48.** Rays of light strike a horizontal plane mirror at an angle of 45°. A second plane mirror is arranged at an angle 6 with it. If the ray after reflection from the second mirror goes horizontally parallel to the first mirror, then 6 is

(a) 67.5° (b) 135°

(c) 45° (d) 60°

49. Two vertical plane mirrors are inclined at an angle of 60°, with each other. A ray of light travelling-horizontally is reflected first from one mirror and then from the other mirror. Then the resultant deviation is

(a) 180°
(b) 240°

() 600	(1) 4200
(C) 60°	(d) 120°

- **50.** Two planes mirrors are inclined to each other at an angle of 70°. A ray is incident on one mirror at an angle 9. The ray reflected from this mirror falls on the second mirror from where it is reflected parallel to the first mirror. The value of e is
  - (a) 50° (b) 40° (c) 70° (d) 60°
- **51.** Two plane mirrors are inclined to each other at an angle 9. A ray of light is reflected first at one mirror and then at the other. The total deviation of the ray is

(a) $360^{\circ} - 2\theta$	(b) $180^{\circ} - \theta$
(c) 20	(d) $240^{\circ} - 2\theta$

**52.** A motorcar is fitted with a convex driving mirror of focal length 20 cm. A second motorcar 2 m broad and 1.6 m high is 6 m away from the first car. Then the position of the second car as seen in the mirror of the first car is

(a) 21.4 cm	(b) 15.4 cm
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- (c) 19.4 cm (d) 17.4 cm
- **53.** In the above question, the breadth and height of the second car seen in the mirror of first car, are respectively

(a) 2.5 cm, 4.6 cm	(b) 1 m, 0.8 m
(c) 5.2 cm, 6.4 cm	(d) 6.4 cm, 5.2 cm

54. An object is placed in front of a convex mirror at a distance of 50 cm. A plane mirror is introduced covering the lower half of the convex mirror. If the distance between the object and the plane mirror is 30 cm, it is found that there is no parallax between the images formed by the two mirrors. The radius of the curvature of the convex mirror is

(a) 12.5 cm
(b) 25 cm

(c) = 50  cm	(d) 27 5 cm
(C) 50 Cm	(a) 37.5 cm

**55.** The focal length of a concave mirror is *f* and the distance from the object to the principal focus is *x*. Then the ratio of size of the image to the size of the object is

(a) 
$$\frac{f^2}{x^2}$$
 (b)  $1 + \frac{x}{f}$   
(c)  $\sqrt{\frac{f}{x}}$  (d)  $\frac{f}{x}$ 

56. A person standing midway between the-two walls of a room 15 m high looks into a plane mirror fixed on the wall. The minimum length of the plane mirror required for him to see the full length image of the wall behind him is equal to (h) 75m(a) Em

(c) 15 m (d) 10 m	

57. A concave mirror of focal length 200 cm is used to obtain the image of the sun which subtends an angle of 30', then diameter of the image of the sun is

(c) 0.87 cm (d) 1.74 cm

58. A convex mirror of focal length f produces an image  $\frac{1}{n}$  th of the size of the object. The

distance of the object from the mirror is

(a) 
$$\frac{n+1}{n}f$$
 (b)  $(n+1)f$ 

 $(\mathsf{d})\left(\frac{n-1}{n}\right)f$ (c) (n-1)f

59. A small piece of wire bent into an L shape with upright and horizontal portions of equal lengths, is placed with the horizontal portion along the axis of the concave mirror whose radius of curvature is 10 cm. If the bend is 20 cms from the pole of the mirror, then the ratio of the lengths of the images of the upright and horizontal portions of the wire is (a) 1:3 (b) 2 :1

(c) 1:2	(d) 3:1
(() 1.2	(u) 5.1

- 60. An object is at a distance d = 20 cm from a plane mirror. Then it is displaced by  $\Delta d_1 = 10$ cm from the mirror in the normal direction and by  $\Delta d_2 = 50$  in the direction parallel to the mirror surface. What is the initial and final distance between the object and its image? (a) 40 cm, 10 cm (b) 20 cm, 80 cm (c) 40 cm, 100 cm (d) 40 cm, 60 cm
- 61. A perfectly reflecting mirror has an area or cm<sup>2</sup>. Light energy is allowed to fall on it for one hour at the rate of 10 W  $cm^{-2}$ . The force that acts on the mirror is

(a) 3.35×10 <sup>-7</sup> N	(b) $6.7 \times 10^{-7} \mathrm{N}$
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#### (c) $3.35 \times 10^{-8}$ N (d) $6.7 \times 10^{-8}$ N

Ray optics is valid, when characteristic 62. dimensions are

(a) of the order of one millimeter

(b) much larger than the wavelength of light

(c) of the same order as the wavelength of light

(d) much smaller than the wavelength of light

63. A short linear object, of length l, lies along parallel to the axis of a concave mirror, of focal length f, at a distance d from the pole of the mirror. The size of the image is then (nearly)

(a) 
$$\frac{lf^2}{(d+f)^2}$$
 (b) 
$$\frac{(d+f)^2}{f_2}l$$
  
(c) 
$$\frac{lf}{d+f}$$
 (d) 
$$\frac{d+l}{lf}$$

64.

All of the following statements are correct except

(a) a virtual, erect, magnified image can be formed using a concave mirror

(b) a real, inverted, same sized image can be formed using a convex mirror

(c) the magnification produced by a convex mirror is always less than one

(d) a virtual, erect, same sized image can be obtained by using a plane mirror

65. The maximum deviation produced by a prism in a monochromatic light ray

(a) depends upon refractive index of prism

(b) depends upon the angle of incidence

(c) depends upon the refracting angle of the prism

(d) depends upon incident angle

- 66. A ray of light is incident on a plane mirror at an angle of incidence 30° The ray, after reflection, is deviated through
  - (a) 30° (b) 60°
  - (c) 90° (d) 120°
- A man runs towards the plane mirror at 67.  $2ms^{-1}$ . The relative speed of his image with respect to him will be

(a) $2ms^{-1}$	(b) $4ms^{-1}$
(c) $8ms^{-1}$	(d) $10ms^{-1}$

**68.** Which of the following can produce a virtual image?

(a) Plane mirror	(b) Concave mirror
(c) Convex lens	(d) All of the above

**69.** A virtual image three times the size of the object is obtained with a concave mirror of radius of curvature 36 cm. The distance of the object from the mirror is

(a) 20 cm	(b) 10 cm
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(c) 12 cm (d) 5 cm

- 70. The image formed by a convex mirror of focal length 30 cm is a quarter of the size of object. The distance of the object from the mirror is
  (a) 60 cm
  (b) 120 cm
  (c) 90 cm
  (d) 30 cm
- **71.** An object is placed at the centre of curvature of a concave mirror. The distance between its image and the pole is
  - (a) equal to f (b) between/and 2f
  - (c) equal to 2f (d) greater than 2f
- **72.** If an incident ray passes through the centre of curvature of a spherical mirror, the reflected ray will
  - (a) pass through the pole
  - (b) pass through the centre of curvature
  - (c) retrace its path
  - (d) be parallel to the principal axis
- **73.** For a concave mirror, whenever the distance of the object is less than the focal length, the image is virtual. That is called virtual image, because
  - (a) the image is formed behind the mirror
  - (b) the image is not inverted
  - (c) the image cannot be obtained on screen

(d) the image can be located by virtue of parallax

**74.** In case of concave mirror, the minimum distance between a real object and its real image is

(a) <i>f</i>	(b)2f
(c) 4 <i>f</i>	(d) zero

**75.** If the magnification of a body of size 1 m is 2, what is the size of the image?

(a) 2m	(b) 2 m
(c) 3m	(d) 4 m

**76.** A plane mirror is moved towards a stationary observer with a speed of  $4ms^{-1}$ . The speed with which his image will move towards him?

(a)  $2ms^{-1}$  (b)  $4ms^{-1}$ 

(c)  $8 m s^{-1}$ 

- (d) the image will stay at rest
- 77. Choose the only wrong statement from the following

(a) a convex mirror forms virtual images for all positions of the object.

(b) a concave mirror forms real images for all positions of the object.

(c) a concave mirror, if suitably placed in front of an object, can form a unity.

(d) the magnification produced by a convex mirror is always less than unity.

**78.** A concave mirror gives an image three times as large as the object placed at a distance of 20 cm from it. For the image to the real, the focal length should be

(a) 10 cm	(b) 15 cm
(c) 20 cm	(d) 30 cm

### FILL IN THE BLANKS

- A concave mirror gives real, inverted and same size image if the object is placed at.....
- A concave mirror gives virtual, erect and enlarged image if the object is placed.....
- **3.** Focal length of combination of two thin lenses of power + 6 D and 2 D is .....
- The radius of curvature of a mirror is 20 cm, its focal length is .....
- **5.** An incident ray makes 60° angle with the surface of the plane mirror the angle of reflection is .....
- 6. If the linear magnification in case of spherical mirror is greater than one, then the image formed is .....
- 7. The magnification of image in case if an object is placed 10 cm in front of a concave mirror of radius of curvature 15 cm is ......
- **8.** A ray of light falling normally on a mirror reflect by .....angle.
- **9.** If an object is placed between two plane mirrors inclined at 30° to each other then the number of images formed is ......
- **10.** If distance of a surface from a source is made twice, the luminance of the surface becomes
- **11.** If the object is placed at focus of a concave mirror, the image is formed at .....

# TRUE OR FALSE

- Light is an electromagnetic radiation. 1.
- 2. Light always behaves like a wave.
- 3. The effective width of a spherical mirror from which reflection can take place is called its aperture.
- 4. A convex mirror produces a virtual, erect and magnified image.
- 5. Laws of reflection are applicable to all types of reflecting surfaces.
- According to sign conventions, the distance 6. measured in the direction of incident light is takes as negative.
- 7. The pole of a spherical mirror is the centre of the mirror.
- 8. When an object is at the centre of curvature a concave mirror, the image formed will be virtual and erect.
- 9. If an object of height 1 cm is placed near a concave mirror of magnification 10, then the height of the image will be 10 cm.
- 10. Α convex mirror is used in the ophthalmoscope.
- Irregular reflection of light gives a sharp 11. image
- 12. Spherical mirrors can also be used as trick mirrors.
- 13. Focal length of a plane mirror is infinity.
- Concave mirror forms a full size image of a 14. far- off large object.
- 15. A virtual image cannot be photographed.
- 16. Linear magnification of a convex mirror is always negative.
- 17. A ray incident along normal to the mirror retraces its path.

#### Matrix Match T

In this section each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in Column-I have to be matched with statements (p, q, r, s) in Column-II

Column I (A) f (focal length)

1.

Column II  
(p) 
$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

(B) Plane mirror (q) 
$$\frac{\pi}{2}$$

(C) Mirror equation 
$$(r) = -\frac{u}{u}$$
  
(D) Magnification  $(s) m = +1$   
2. Column I Column II  
(A) Car head lights (p) Plane mirror  
(B) Looking glass (q) Convex mirror  
(C) Make-up mirror (r) Concave mirror  
(D) Vigilance mirror (s) Diverging mirror  
3. Column I Column II  
(A) Power of convex (p) Positive power  
mirror  
(B) Power of concave (q) Negative power  
mirror  
(C) Power of plane mirror (r) Zero power  
(D) Power of convex lens (s) Infinite power  
4. Column I Column II  
(A) Regular reflection (p) Paper  
(B) Concave mirror (r) Mirror  
(D) Irregular reflection (s) Real focus  
5. Column I Column II  
(A) Reflector (p) Plane mirror  
(B)Lateral inversion (q) Sun

(D)Luminous object

#### (s) Waxed paper

## ASSERTION & REASON QUESTIONS

Directions: In each of the following questions, a statement of Assertion (A) is given followed by a an responding statement of Reason (R) just below it. Of the statements, mark the correct answer as

(a) If both assertion and reason are true and reason is the correct explanation of assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of assertion.

(c) If assertion is true but reason is false

(d) If assertion is false but reason is true.

- 1. Assertion: If a plane glass slab is placed on the letters of different colours all the letters appear to be raised up to the same height. Reason: Different colours have different wavelengths.
- 2. Assertion: The mirrors used in search lights are parabolic and not concave spherical. Reason: In a concave spherical mirror the image formed is always virtual.

(r) U (C) Mirror equation

(C)Translucent (r) Silver

- Assertion: The twinkling of star is due to reflection of light.
   Reason: The velocity of light does not change while going from one medium to the other.
- Assertion: A ray incident along normal to the mirror retraces its path.
   Reason: In reflection, angle of incidence is always equal to angle of reflection.
- **Assertion:** For the observing traffic at our back, we prefer use a convex mirror.
   **Reason:** A convex mirror has a much larger field of view than a plane mirror or a concave mirror.
- Assertion: If the angle between the two plane mirror is 72° and the object is asymmetrically placed between the two mirrors, then 5 images of the object will be formed.



**Reason:** For given system of mirror the total number of images formed due to successive

reflection is equal to eithe  $\frac{360^{\circ}}{\theta}$  or  $\frac{360^{\circ}}{\theta}$ .

accordingly as  $\frac{360^{\circ}}{\theta}$  is odd or even

respectively.

- Assertion: When a concave mirror is held under water, its focal length will increase.
   Reason: The focal length of a concave mirror is independent of the medium in which it is placed.
- Assertion: A convex mirror is used as a driver's mirror.
   Reason: Because convex mirror's field of view is large and images formed are virtual erect

is large and images formed are virtual, erect and diminished.

**9. Assertion:** Keeping a point object fixed, if a plane mirror is moved, the image will also move.

**Reason:** In case of a plane mirror, distance of object and its image is equal from any point on the mirror.

**10. Assertion:** We can decide the nature of a mirror by observing the size of erect image in the mirror



**Reason:** The minimum distance between a real object and its real image in a concave mirror is zero.

- Assertion: The fluorescent tube is considered better than an electric bulb.
   Reason: Efficiency of fluorescent tube is more than the efficiency of electric bulb.
- 12. Assertion: When the object moves with a velocity  $\vec{v}$ , its image in the plane mirror moves with a velocity of  $-2\vec{v}$ Reason: The minimum height of the mirror to be required to see the full image of man of height h is
- **13. Assertion:** Reflection of light is the phenomenon of bouncing back of light in the same medium on striking the surface of any object.

**Reason:** Light particle possess, elastic property.

- Assertion: ENT specialist use a concave mirror as a head mirror to concentrate light on the body parts like eye, ear, nose etc.
   Reason: A concave mirror is more cost effective and easily available.
- **15. Assertion:** Large convex mirrors are used to concentrate sunlight to produce heat is solar cookers.

**Reason:** Convex mirror converges the light rays falling on it to a point.