CONCEPT APPLICATION LEVEL - III

SECTION - A

● **Fill in the blanks with the appropriate words:**

Q.1 Impression of an image persists for ..... of the second on retina.
Q.2 Angle of reflection is always ..... to the angle of incidence.
Q.3 ..... is a small opening in the cornea.
Q.4 Cones are sensitive to ..... light.
Q.5 Muscles attached to the eye lens ..... and the lens becomes ..... when distant objects are to be seen.
Q.6 To keep our eyes fit our diet should include vitamin .. .. rich eatables.
Q.7 Impression of an image is formed on .....
Q.8 Braille system has ..... dot patterns.
Q.9 If you touch your ..... ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with .....
Q.10 The size of the pupil becomes ..... when you see in dim light.
Q.11 Night birds have ..... cones then rods in their eyes.
Q.12 The most popular resource for visually challanged person is .....

SECTION - B

● **Match the following items given in Column 'A' with that in Column 'B':**

Q.1

Column 'A'		**Column 'B'**	
(i)	Cornea	(a)	Transparent front part of eye
(ii)	Pupil	(b)	Layer on which impression of images is formed
(iii)	Iris	(c)	Point on retina where there are no more all endings
(iv)	Retina	(d)	Sensitive for bright light
(v)	Blind spot	(e)	Is a small opening in the cornea
(vi)	Rods	(f)	Sensitive for dim light
(vii)	Cones	(g)	Controls the size of the pupil

SECTION - C

● **State whether the statements given below are True or False :**

Q.1 Both incident ray and reflected ray lie in the same plane.
Q.2 Diffused reflection is due to the failure of the laws of reflection.
Q.3 The image formed by plane mirror is laterally inverted.
Q.4 The iris is the coloured part of the eye.
Q.5 Rods are sensitive to bright light.
Q.6 Changing of the thickness of the eye lens is called accommodation.

SECTION - D

● **Choose the correct option in the following questions:**

Q.1 A smooth shining surface, which rebounds the light back in same or in different direction is called
(A) a mirror (B) a lens (C) reflection of light (D) point of incidence

Q.2 Beam of light striking the reflecting surface is called
(A) reflecting ray (B) incident ray (C) refracted ray (D) normal ray

Q.3 Band of seven colours is called
(A) VIBGYOR (B) spectrum (C) dispersion (D) reflection

Q.4 Front bulged part of the eyeball is called
(A) cornea (B) choroid (C) pupil (D) retina

Q.5 Image formed by mirrors are
(A) real only (B) virtual only (C) both real and virtual (D) neither real nor virtual

Q.6 In case of reflection of light, the angle of incidence (i) and the angle of reflection (r) are related as
(A) $i = r$ (B) $i < r$ (C) $i > r$ (D) no definite relation

Q.7 Name the type of mirror used as a backview mirror.
(A) Plane mirror (B) Concave mirror (C) Convex mirror (D) Any of these

Q.8 Visually impaird people can read and write using
(A) electronic writer (B) digital pens (C) braille system (D) hearing aids

Q.9 The image formed by a camera and a simple microscope are respectively
(A) real and real (B) real and virtual (C) virtual and virtual (D) virtual and real

Q.10 What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray ?
(A) 60° (B) 45° (C) 90° (D) 180°

Q.11 The splitting of white tight into its seven constituent colours is called
(A) refraction (B) dispersion (C) deviation (D) reflection

Q.12 The defect due to which a person is not able to see the distant objects clearly :
(A) Myopia (B) Hypermetropia (C) Cornea (D) Cataract

Q.13 The amount of light entering the eye is controlled by
(A) eye lens (B) cornea (C) iris (D) ciliary muscle

Q.14 Myopia can be corrected by using a
(A) concave lens (B) convex lens (C) opaque lens (D) micro lens

Q.15 Light enters the eye through
(A) eye lens (B) pupil (C) cornea (D) retina

Q.16 Light causes the sensation of
(A) Vision (B) Light (C) Both (A) and (B) (D) None

Q.17 When a part of the incident light is returned back into the same medium, it is called :
(A) Refraction (B) Reflection (C) Both (A) and (B) (D) Absorption

Q.18 The branch of physics where light and its phenomena are studied is called :
(A) Optics (B) Acoustics (C) Mechanics (D) None

Q.19 Light is
(A) an electromagnetic radiation (B) a longitudinal wave
(C) massless (D) all of the above

Q.20 Which of the following is a natural luminous source of light ?
(A) Sunlight (B) Wood (C) Electric lamp (D) Torch light

Q.21 Which of the following is not a translucent object ?
(A) Greased paper (B) Paraffin wax (C) Froasted glass (D) Water

Q.22 Light shows :
(A) Random propagation (B) Curvilinear propagation
(C) Rectilinear propagation (D) None of these

Q.23 Which of the following is a reflector of light ?
(A) Sun (B) Star (C) Filament (D) Moon

Q.24 Wood is an example of :
(A) Translucent (B) Transparent (C) Polymer (D) Opaque

Q.25 The image formed by a plane mirror is :
(A) Laterally inverted
(B) Virtual
(C) At a same distance behind the mirror as the object
(D) All of the above

Q.26 If two plane mirrors are inclined at an angle of 60° then the number of images formed by the object placed between these mirrors are :
(A) 4 (B) 3 (C) 5 (D) 6

Q.27 The surfaces which cannot produce clear images are called :
(A) rough surface (B) ideal surface (C) smooth surface (D) curved surfaces

Q.28 If the angle of incidence is 50°, then calculate the angle between the incident ray and the reflected ray :
(A) 50° (B) 100° (C) 130° (D) 80°

Q.29 The angle of incidence in a plane mirror is ..... the angle of reflection :
(A) equal to (B) greater than (C) less than (D) can't say

Q.30 Plane mirrors are arranged parallel to each other to get :
(A) A single image (B) Two images
(C) A large number of reflected images (D) No image

Q.31 To get 9 multiple images the angel between the plane mirrors should be :
(A) 60° (B) 36° (C) 50° (D) 90°

Q.32 When an object is moved towards the plane mirror :
(A) Image moves away from the object (B) Size of the image increases
(C) Image moves closer to the object (D) Size of the image decreases

Q.33 Which of the following statement is true ?
(A) The angle of incidence is twice the angle of reflection.
(B) The incident ray, the reflected ray and the normal drawn at the point of incidence lie in the same plane.
(C) Some types of virtual images can be caught on the screen.
(D) A plane mirror forms a real image.

Q.34 A real image :
(A) cannot be captured on a screen (B) can be captured on a screen
(C) can be captured only on a celluloid screen (D) none of the above

Q.35 When the distance between the object and the plane mirror increases :
(A) the image remains same
(B) the size of the image will become less than the size of the object.
(C) the distance between the image and the plane mirror increases
(D) the distance between the image and the plane mirror decreases

Q.36 A virtual image is
(A) always real (B) always inverted
(C) always caught on a screen (D) always uncapturable on a screen

Q.37 In lateral inversion :
(A) right of the object will be right side of the image
(B) left side of the object will be left side of the image
(C) upside of the object will be down side of the image
(D) right side of the object will be left side of the image

Q.38 Human eye has lens of
(A) Fixed forcal length (B) Variable focal length
(C) Variable refractive index (D) Glass

Q.39 Eye defect due to aging is called
(A) Myopia (B) Hypermetropia (C) Presbyopia (D) Astigmatism

Q.40 Cylindrical lens is used in case of
(A) Myopia (B) Hypermetropia (C) Presbyopia (D) Astigmatism

Q.41 The amount of light entering into the eye is controlled by :
(A) Iris (B) Pupil (C) Cornea (D) Optic nerves

Q.42 The persistence of vision of the eye is :
(A) $\frac{1}{16}$ second (B) $\frac{1}{10}$ second (C) $\frac{1}{26}$ second (D) $\frac{1}{100}$ second

Q.43 The accommodation of a normal eye is from :
(A) 0 to 25 cm (B) zero of infinite (C) 25 cm to infinity (D) None of the above

Q.44 In the human eye, which part of the eye receive the optical image of the object and then convert it to electrical pulses ?
(A) Cornea (B) Sclerotic (C) Retina (D) None of these

Q.45 The defect of vision in which person can see distant objects clearly but nearby object look blurred is :
(A) Myopia (B) Astigmatism (C) Hypermetropia (D) Presbyopia

Q.46 The human eye form the image of an object at its :
(A) Iris (B) Cornea (C) Retina (D) Pupil

Q.47 A human eye can focus objects at different distances by adjusting the focal length of the eye lens. This is due to :
(A) Far-Sightedness (B) Near-sightedness (C) Accommodation (D) Persistence of vision

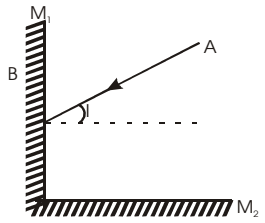
Q.48 Two mirrors are kept at 60º to each other and a body is placed at the middle. The total number of images formed is :
(A) Three (B) Four (C) Five (D) Six

Q.49 When a ray of light is incident on a plane mirror, with reflection it is deviated through angle θ . If the angle made by incident ray with the mirror is i. then angle of deviation θ will be :
(A) 1 i (B) 2i (C) 180 - 2i (D) 80 - i

Q.50 A mirror is rotated through angle θ about an axis passing through the point of incident and lying in the plane of the mirror. The reflected ray will be rotated through.
(A) θ/2 (B) θ (C) 2θ (D) 3θ

Q.51 A car is moving towards a plane mirror at a speed of 30 m/s. Then the relative speed of its image with respect to car will be :
(A) 30 m/sec. (B) 60 m/sec (C) 15 m/sec (D) 45 m/sec

Q.52 The mirrors are perpendicular at each other as shown in the figure. A light ray AB is incident on the mirror M_1. Then the reflected ray will also suffer a reflection from the mirror M_2. Then the final ray after reflection from M_2 will be parallel to the incident ray if.



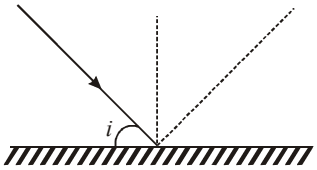
(A) i = 45º (B) i = 60º
(C) i < 30º (D) for any i between 0º and 90°

Q.53 Two mirrors make an angle of 90º with each other. If a ray of light is incident on the first mirror at an angle of incident i, the reflected ray from the second mirror will make an angle of reflection.
(A) 0º (B) i (C) 90 – i (D) 45 - i

Q.54 The radius of curvature and magnification of a plane mirror are :
(A) R= ∞ , m= 0 (B) R= 0 , m= 1 (C) R= ∞ , m= 1 (D) R=0 , m=0

Q.55 Which of the following are used in Kaleidoscope?
(A) Plane mirror (B) Cocave mirrors (C) Convex mirrors (D) all above

Q.56 An ray incidents on a mirror as shown in Figure, angle of reflection would be :



(A) i (B) 2i (C) 90 – i (D) 180 – 2i

Q.57 The mirror used in automobiles to see the rear field of view is
(A) concave (B) convex (C) plane (D) none of these

Q.58 The mirror used in search lights is
(A) concave (B) convex (C) plane (D) none of these

Q.59 If we say that the focal length of a spherical mirror is *n* times its radius of curvature, then *n* must be
(A) 2.0 (B) 1.5 (C) 0.2 (D) none of these

Q.60 Which is the wrong statement out of the following ?
(A) A concave mirror can give a virtual image.
(B) A convex mirror can give a virtual image.
(C) A concave mirror can give a diminished virtual image.
(D) A convex mirror cannot give a real image.

Q.61 An inverted image can be seen in a convex mirror
(A) under no circumstances.
(B) when the object is very far from the mirror.
(C) when the object is at a distance equal to the radius of curvarture of the mirror.
(D) when the distance of the object from the mirror is equal to the focal length of the mirror.

Q.62 A virtual image is one which
(A) can be taken on a screen.
(B) cannot be taken on a screen.
(C) sometimes can be and sometimes cannot be taken on a screen.
(D) is formed only by a concave mirror.

Q.63 When an object is placed between the focus and the pole of a concave mirror, the image formed is
(A) real, inverted and small. (B) real, inverted and same size.
(C) real, inverted and enlarged. (D) virtual, erect and enlarged.

Q.64 The mirror used by dentists to concentrate light on the tooth to be examined is a _____ mirror.
(A) concave (B) plane or concave (C) convex (D) plane

Q.65 Which of the following mirror is used to concentrate light on a given spot ?
(A) Concave mirror (B) Convex mirror (C) Plane mirror (D) None of these

Q.66 The unit of power of a lens is
(A) metre (B) dyne (C) dioptre (D) None of these

Q.67 The focal length of a lens is 50 cm. Its power would be
(A) 50 dioptre (B) 2 dioptre (C) 20 dioptre (D) None of these

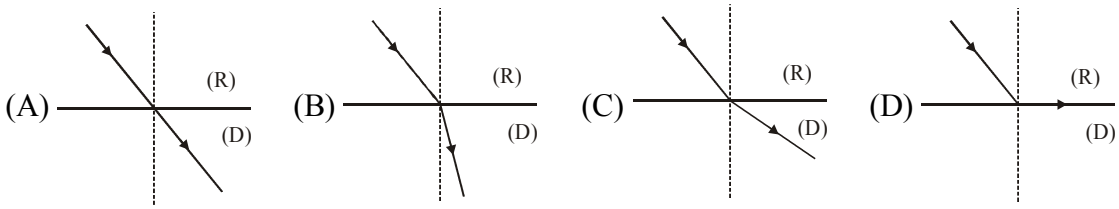
Q.68 A simple magnifying glass consists of a
(A) concave lens (B) convex lens of large focal length
(C) convex lens of small focal length (D) plane mirror only

Q.69 The power of a lens being +4 dioptres suggests it is a
(A) convex lens (B) plano-convex lens (C) concave lens (D) none of these

Q.70 If the power of a lens is 0.1 D, its focal length is
(A) 1 m (B) 10 m (C) 100 m (D) –10 m

Q.71 The refraction of light is commonly known as
(A) bending (B) scattering (C) reflection (D) interference

Q.72 Which of the following shows the bending of light from rarer (R) into denser (D) medium?



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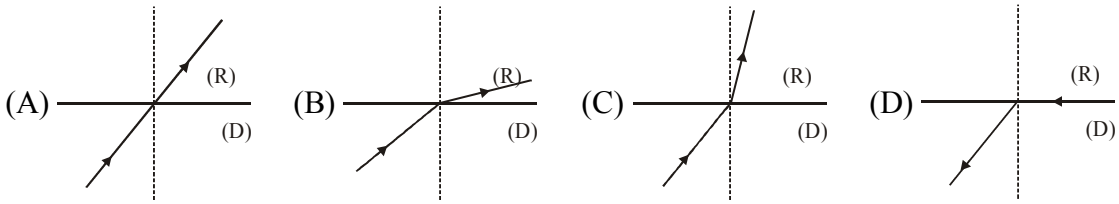
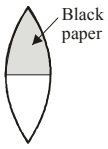
Q.73 Which of the following shows the bending of light from denser (D) medium into a rarer (R) medium?



Q.74 How will the image formed by a convex lens be affected if the upper half of the lens is wrapped with a black paper?



(A) The size of the image is reduced to one-half (B) The upper half of the image will be absent
(C) The brightness of the image is reduced (D) There will be no effect

Q.75 The focal length of a lens is –0.4 m. The lens is
(A) convex (B) concave (C) cylindrical (D) none of these

Q.76 The focal length of a lens is 0.1 m. Then the lens must be
(A) convex (B) concave (C) cylindrical (D) none of these

Q.77 The screen behind the eye lens is called the
(A) iris (B) ciliary muscle (C) retina (D) pupil

Q.78 Cornea is a transparent spherical structure which
(A) reflects light (B) scatters light (C) refracts light (D) none of these

Q.79 The amount of light entering the eye is controlled by the
(A) iris (B) cornea (C) pupil (D) crystalline lens

Q.80 The eye lens contains a watery liquid called the
(A) aqueous humour (B) peroxide (C) vitreous humour (D) none of these

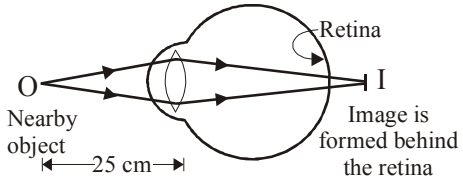
Q.81 Long-sightedness is caused by the eyeball being too short. It can be corrected by the use of a
(A) convergent lens (B) plane mirror (C) divergent lens (D) none of these

Q.82 Hypermetropia is due to the _____of the eye.
(A) low converging power (B) low diverging power
(C) high converging power (D) high diverging power

Q.83 Which of the following lens is used to minimise myopia?
(A) Convex lens (B) Conave lens (C) Cylindrical lens (D) none of these

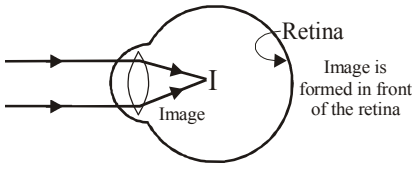
Q.84 The hyman eye forms the image of an object at its
(A) cornea (B) iris (C) pupil (D) retina

Q.85 Figure shows the eye suffering from



(A) hypermetropia (B) myopia (C) astigmatism (D) none of these

Q.86 Figure shows the eye suffering from



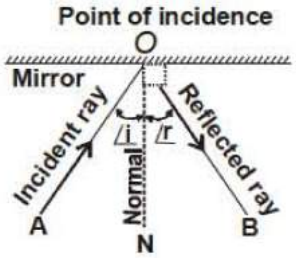
(A) hypermetropia (B) myopia (C) astigmatism (D) none of these

Q.87 When the light is very bright?
(A) the iris makes the pupil expand (B) the iris makes the pupil contract
(C) the iris and the pupil remain as they are (D) none of these

SECTION - E

Previous Years Questions

Q.1 The figure shows what happens to a ray of light as it strikes a plane mirror. Which statement is not true about this figure? **[NSO-2010]**

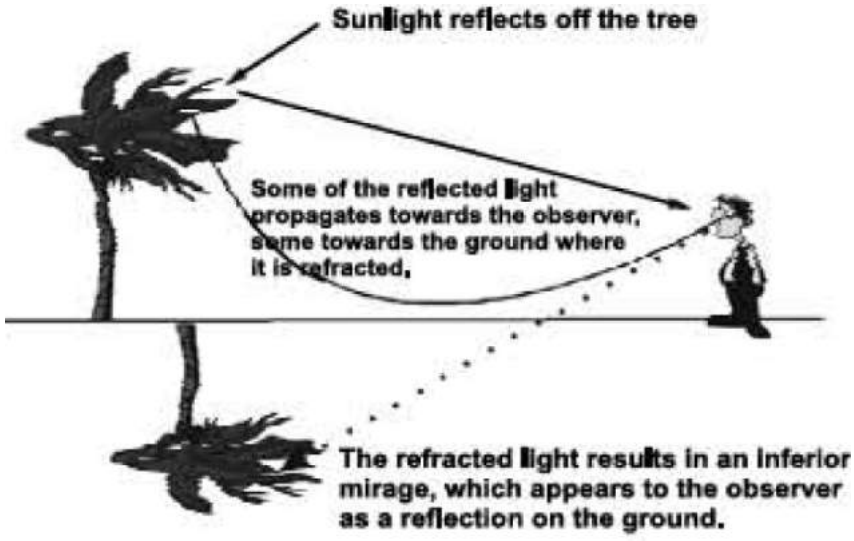


(A) ∠AON = ∠BON
(B) AO is the incident ray.
(C) O is the only point from where the light ray can be reflected.
(D) If BO is the incident ray, then OA will be the reflected ray.

Q.2 Sangi needs to identify three different materials, X, Y and Z. Material X casts a faint shadow when light is shone on it. Material Y does not cast a shadow when light is shone on it. Material Z casts a clear shadow. Which one of the following could materials X, Y and Z be? **[NSO-2011]**

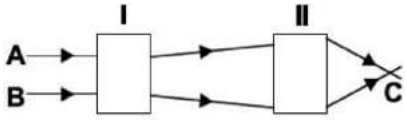
	X	**Y**	**Z**
(A)	Fabric	Metal	Tracing paper
(B)	Tracing paper	Glass	Metal
(C)	Tracing paper	Glass	Fabric
(D)	Glass	Fabric	Metal

Q.3 A mirage is observed when _____. **[NSO-2011]**



(A) Density of air decreases with increase of height.
(B) Density of air increases with height.
(C) Refractive index of air decreases with increase of height
(D) Earth acts like a mirror.

Q.4 Two parallel rays of light A and B as shown in the figure pass through two boxes. The possible combination of devices used in boxes I and II are _____. **[NSO-2011]**



(A) Convex lens and concave lens
(B) Concave mirror and convex mirror
(C) Concave lens and concave mirror
(D) Concave lens and convex lens

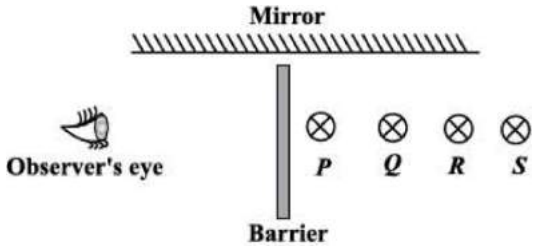
Q.5 A candle is placed before a thick plane mirror. When looked obliquely in the mirror a number of images are seen from the surface of the plane mirror. Which of the following statements is correct? **[NSO-2012]**
(A) First image is brightest.
(B) Second image is brightest.
(C) Third image is brightest.
(D) All images are equally bright.

Q.6 On holding a stainless steel spoon near our face, we see **[NSO-2012]**
(A) Our inverted image on outer side of the spoon.
(B) Our erect image on inner side of the spoon.
(C) Our inverted image on inner side of the spoon.
(D) Our laterally inverted image on inner side of the spoon.

Q.7 The light reflected by a plane mirror may form a real image _____. **[NSO-2012]**
(A) If the rays incident on the mirror are converging.
(B) If the object is placed very close to the mirror.
(C) If the rays incident on the mirror are diverging.
(D) Under no circumstances.

Q.8 Two plane mirrors are placed parallel to each other as shown in the figure. There is an object placed at O between the mirrors at 5 cm from the mirror M_2. What is the distance of third image from the mirror M_2? **[NSO-2012]**
(A) 5 cm (B) 15 cm (C) 25 cm (D) 35 cm

Q.9 The figure shows a barrier placed at right angles to a plane mirror with four lamps at position P, Q, R and S. Which lamp can be seen by the observer? **[NSO-2013]**



(A) P (B) Q (C) R (D) S

Q.10 By using a concave mirror, image of a tree is focused on a screen. The distance between the screen and the mirror is **[NSO-2013]**
(A) Equal to twice the focal length of the concave mirror.
(B) Equal to one fourth of the focal length of the concave mirror.
(C) Equal to half the radius of curvature of the concave mirror.
(D) Equal to the radius of curvature of the concave mirror.

Q.11 Two plane mirrors are inclined to each other at an angle of 60°. If a ray of light incident on the first mirror is parallel to the second minor, it is reflected from the second mirror **[NSO-2013]**

(A) Perpendicular to the first mirror (B) Parallel to the first mirror
(C) Parallel to the second mirror (D) Perpendicular to the second mirror.

Q.12 Read the following statements and select the correct option. **[NSO-2013]**

Statement-1 : A convex mirror is preferred over a plane mirror in vehicles to observe traffic coming from behind.

Statement-2 : Images formed by convex mirror are erect and diminished in size.

(A) Both statement-1 and 2 are true and statement-2 is the correct explanation of statement- I.
(B) Both statement-1 and 2 are hue but statement-2 is not the correct explanation of statement-I.
(C) Statement-1 is true and statement-2 is false.
(D) Both statement-1 and 2 are false.

Q.13 At particular time of a day, the ratio of height of an object and the length of it's shadow is x. Using this, calculate the height of a tree if the length of the shadow of tree is L. **[NSO-2013]**

(A) $\frac{x}{L}$ (B) $x \times L$ (C) $x + L$ (D) $L - x$

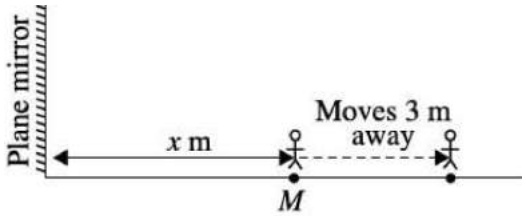
Q.14 The image formed by the side-view mirror of an automobile is

(i) of the same size as that of object. (ii) virtual and diminished
(iii) erect and real. (iv) erect and magnified.

Which of the following statements is/are correct? **[NSO-2014]**

(A) (i) only (B) (ii) only (C) (i) and (iii) only (D) (iii) and (iv) only

Q.15 The diagram shows a man standing at a position M in front of a plane mirror, a distance of x m from the mirror. **[NSO-2014]**



When the man moves 3 m away from the mirror, the new distance between the man and his image becomes 12 m. What is the value of x?

(A) 1 m (B) 2 m (C) 3 m (D) 4 m

Q.16 Read the given statements and mark the correct the option. **[NSO-2014]**

Statement-1: A convex minor always forms a real image.

Statement-2 : A diverging beam incident on a convex minor is reflected as a diverging beam.

(A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
(B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
(C) Statement 1 is false but statement 2 is true.
(D) Both statements 1 and 2 are false.