

CLASS X
SUBJECT - PHYSICS

Question 1.

Which of the following can make a parallel beam of light when light from a point source is incident on it?

- (a) Concave mirror as well as convex lens
- (b) Convex mirror as well as concave lens
- (c) Two plane mirrors placed at 90° to each other
- (d) Concave mirror as well as concave lens

Question 2.

A 10 mm long awl pin is placed vertically in front of a concave mirror. A 5 mm long image of the awl pin is formed at 30 cm in front of the mirror. The focal length of this mirror is

- (a) -30 cm
- (b) -20 cm
- (c) -40cm
- (d) -60 cm

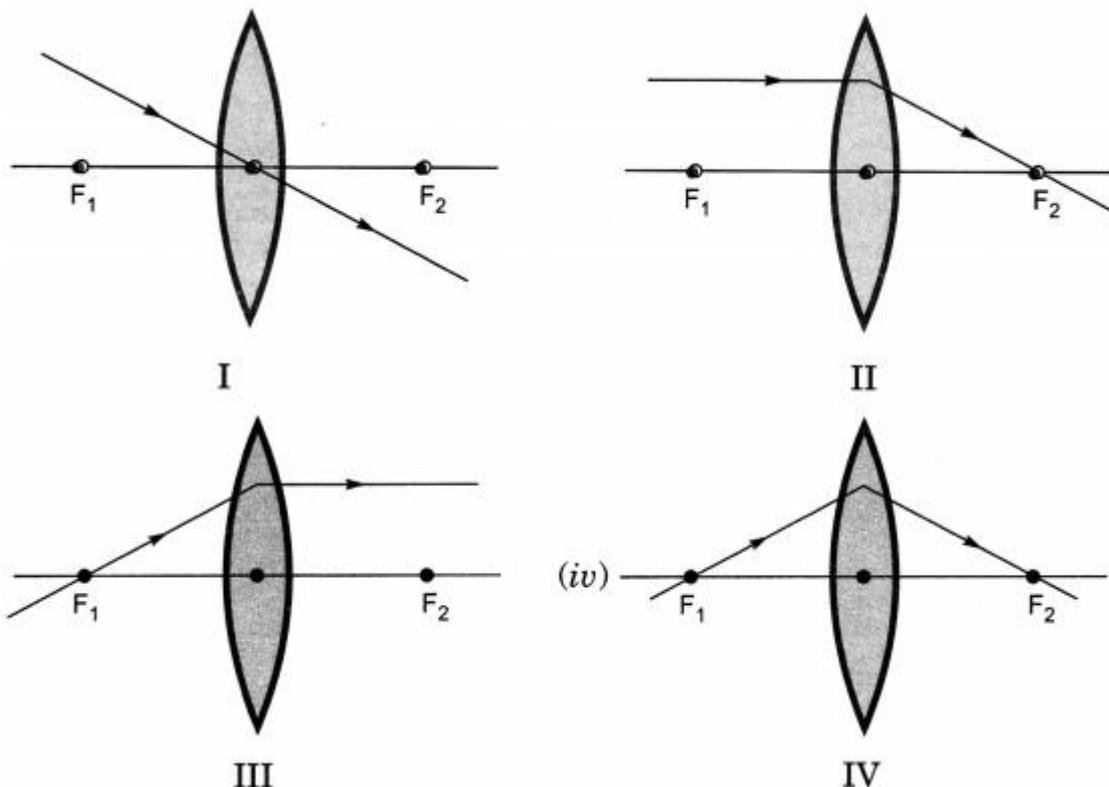
Question 3.

Under which of the following conditions a concave mirror can form an image larger than the actual object?

- (a) When the object is kept at a distance equal to its radius of curvature
- (b) When object is kept at a distance less than its focal length
- (c) When object is placed between the focus and centre of curvature
- (d) When object is kept at a distance greater than its radius of curvature

Question 4.

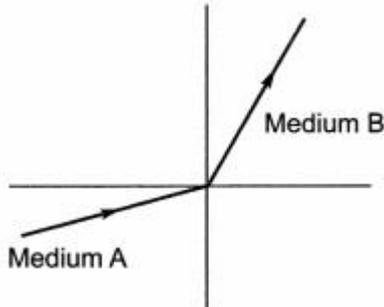
The diagrams showing the correct path of the ray after passing through the



- (a) II and III only
- (b) I and II only
- (c) I, II and III
- (d) I, II and IV

Question 5.

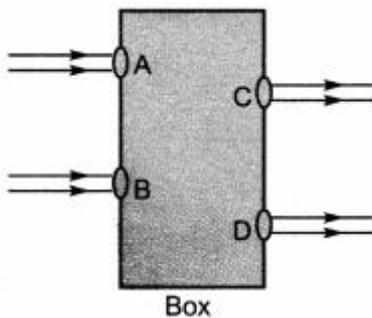
A light ray enters from medium A to medium B as shown in figure. The refractive index of medium B relative to A will be



- (a) greater than unity
- (b) less than unity
- (c) equal to unity
- (d) zero

Question 6.

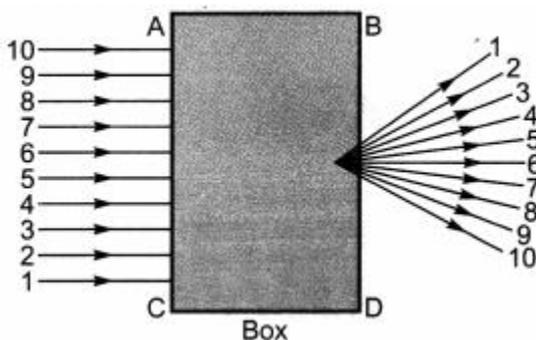
Beams of light are incident through the holes A and B and emerge out of box through the holes C and D respectively as shown in the figure. Which of the following could be inside the box?



- (a) A rectangular glass slab
- (b) A convex lens
- (c) A concave lens
- (d) A prism

Question 7.

A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box as shown in the figure. Which of the following could be inside the box?



- (a) Concave lens

- (b) Rectangular glass slab
- (c) Prism
- (d) Convex lens

Question 8.

Which of the following statements is true?

- (a) A convex lens has 4 dioptre power having a focal length 0.25 m
- (b) A convex lens has -4 dioptre power having a focal length 0.25 m
- (c) A concave lens has 4 dioptre power having a focal length 0.25 m
- (d) A concave lens has -4 dioptre power having a focal length 0.25 m.

Question 9.

Magnification produced by a rear view mirror fitted in vehicles

- (a) is less than one
- (b) is more than one
- (c) is equal to one
- (d) can be more than or less than one depending upon the position of the object in front of it.

Question 10.

Rays from Sun converge at a point 15 cm in front of a concave mirror. Where should an object be placed so that size of its image is equal to the size of the object?

- (a) 15 cm in front of the mirror
- (b) 30 cm in front of the mirror
- (c) between 15 cm and 30 cm in front of the mirror
- (d) more than 30 cm in front of the mirror

Question 11.

A full length image of a distant tall building can definitely be seen by using

- (a) a concave mirror
- (b) a convex mirror
- (c) a plane mirror
- (d) both concave as well as plane mirror

Question 12.

In torches, search lights and headlights of vehicles the bulb is placed

- (a) between the pole and the focus of the reflector
- (b) very near to the focus of the reflector
- (c) between the focus and centre of curvature of the reflector
- (d) at the centre of curvature of the reflector

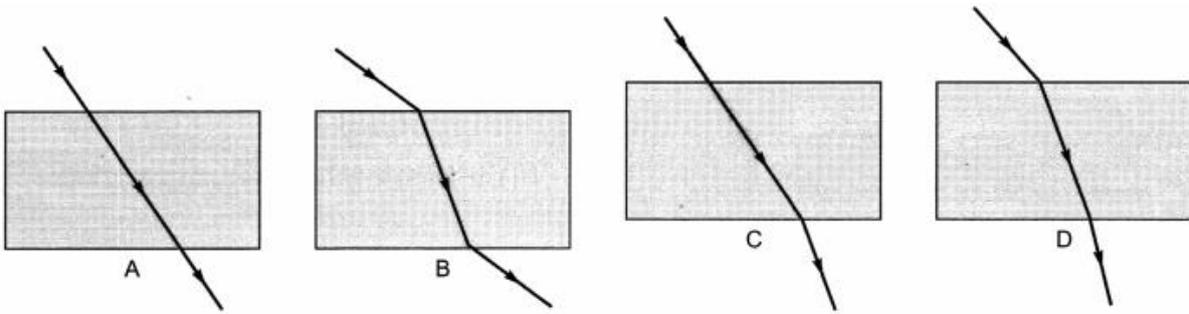
Question 13.

The laws of reflection hold good for

- (a) plane mirror only
- (b) concave mirror only
- (c) convex mirror only
- (d) all mirrors irrespective of their shape

Question 14.

The path of a ray of light coming from air passing through a rectangular glass slab traced by four students are shown as A, B, C and D in figure. Which one of them is correct?



- (a) A
- (b) B
- (c) C
- (d) D

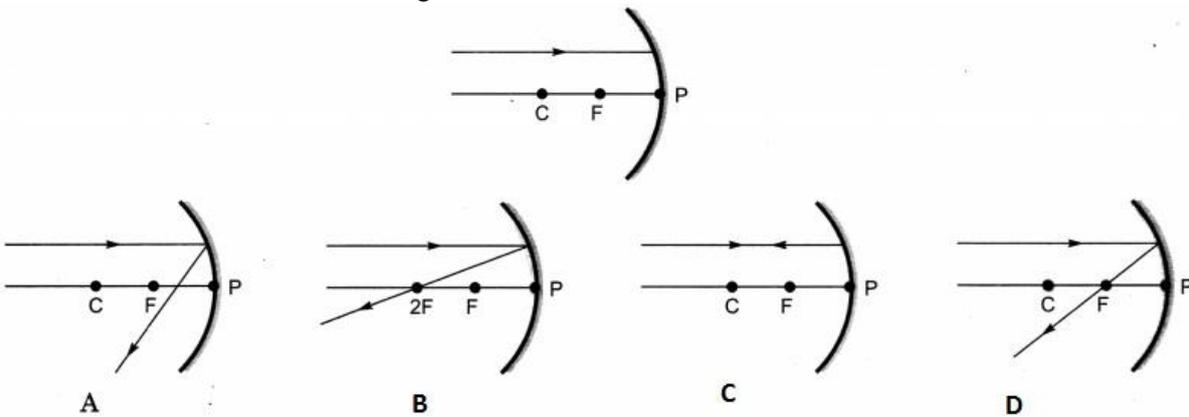
Question 15.

You are given water, mustard oil, glycerine and kerosene. In which of these media a ray of light incident obliquely at same angle would bend the most?

- (a) Kerosene
- (b) Water
- (c) Mustard oil
- (d) Glycerine

Question 16.

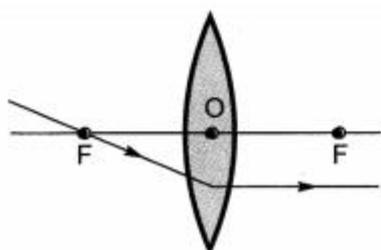
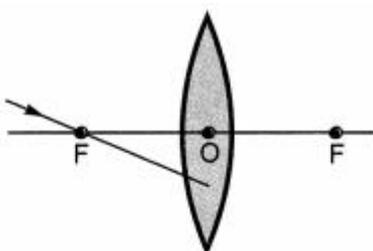
Which of the following ray diagrams is correct for the ray of light incident on a concave mirror as shown in figure?



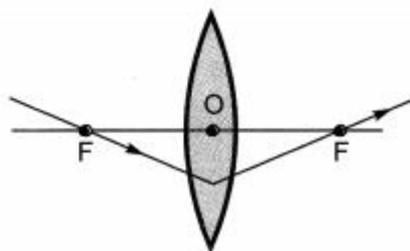
- (a) Fig. A
- (b) Fig. B
- (c) Fig. C
- (d) Fig. D

Question 17.

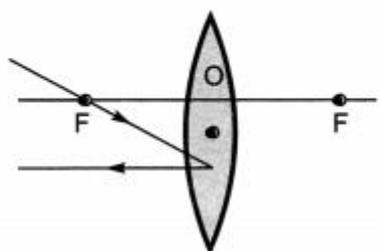
Which of the following ray diagrams is correct for the ray of light incident on a lens shown in figure?



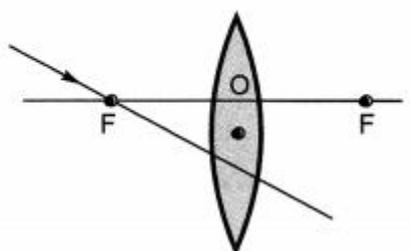
A



B



C



D

- (a) Fig. A
- (b) Fig. B
- (c) Fig. C
- (d) Fig. D

Question 18.

A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of the same size and that of the legs smaller. The following is the order of combinations for the magic mirror from the top.

- (a) Plane, convex and concave
- (b) Convex, concave and plane
- (c) Concave, plane and convex
- (d) Convex, plane and concave

Question 19.

In which of the following, the image of an object placed at infinity will be highly diminished and point sized?

- (a) Concave mirror only
- (b) Convex mirror only
- (c) Convex lens only
- (d) Concave mirror, convex mirror, concave lens and convex lens

Question 20.

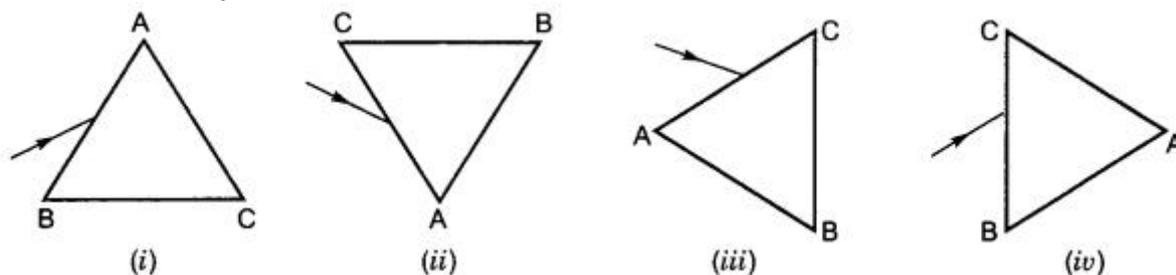
Light travel fastest in

- (a) Water
- (b) Air
- (c) Glass
- (d) Diamond

SECTION -B

Question 21.

A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in the Figures given below. In which of the following cases, after dispersion, the third colour from the top corresponds to the colour of the sky?



- (a) (i)
- (b) (ii)
- (c) (iii)
- (d) (iv)

Question 22.

At noon the sun appears white as

- (a) light is least scattered.
- (b) all the colours of the white light are scattered away.
- (c) blue colour is scattered the most.
- (d) red colour is scattered the most.

Question 23.

Which of the following phenomena of light are involved in the formation of a rainbow?

- (a) Reflection, refraction and dispersion
- (b) Refraction, dispersion and total internal reflection
- (c) Refraction, dispersion and internal reflection
- (d) Dispersion, scattering and total internal reflection

Question 24.

Twinkling of stars is due to atmospheric

- (a) dispersion of light by water droplets
- (b) refraction of light by different layers of varying refractive indices
- (c) scattering of light by dust particles
- (d) internal reflection of light by clouds

Question 25.

The clear sky appears blue because

- (a) blue light gets absorbed in the atmosphere.
- (b) ultraviolet radiations are absorbed in the atmosphere.
- (c) violet and blue lights get scattered more than lights of all other colours by the atmosphere.
- (d) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere.

Question 26.

Which of the following statements is correct regarding the propagation of light of different colours of white light in air?

- (a) Red light moves fastest.
- (b) Blue light moves faster than green light.
- (c) All the colours of the white light move with the same speed.
- (d) Yellow light moves with the mean speed as that of the red and the violet light.

Question 27.

The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light

- (a) is scattered the most by smoke or fog.
- (b) is scattered the least by smoke or fog.
- (c) is absorbed the most by smoke or fog.
- (d) moves fastest in air.

Question 28.

Which of the following phenomena contributes significantly to the reddish appearance of the sun at sunrise or sunset?

- (a) Dispersion of light
- (b) Scattering of light
- (c) Total internal reflection of light
- (d) Reflection of light from the earth

Question 29.

The bluish colour of water in deep sea is due to

- (a) the presence of algae and other plants found in water
- (b) reflection of sky in water
- (c) scattering of light
- (d) absorption of light by the sea

Question 30.

A student traces the path of a ray through a glass prism for four different values of angle of incidence. On analysing the diagrams he is likely to conclude that the emergent ray

- (a) is always parallel to the incident ray.
- (b) is always perpendicular to the incident ray.
- (c) is always parallel to the refracted ray.
- (d) always bends at an angle to the direction of incident ray.

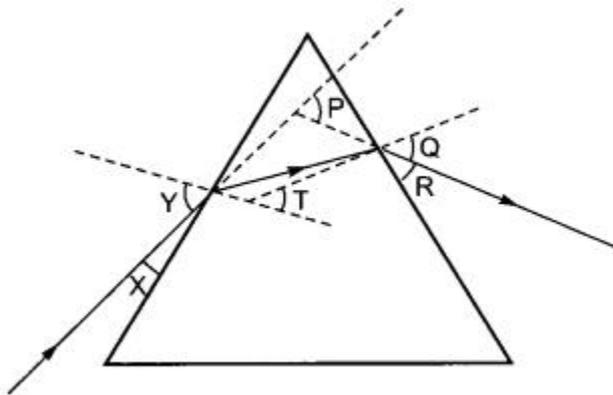
Question 31.

A student is observing the diagram showing the path of a ray of light passing through a glass prism. He would find that for all angles of incidence the ray of light bends:

- (a) towards the normal while entering into the prism and away from the normal while emerging out of the prism
- (b) away from the normal while entering into the prism and towards the normal while emerging out of the prism.
- (c) away from the normal while entering as well as while emerging out of the prism.
- (d) towards the normal while entering as well as while emerging out of the prism.

Question 32.

In the following diagram, the path of a ray of light passing through a glass prism is shown:

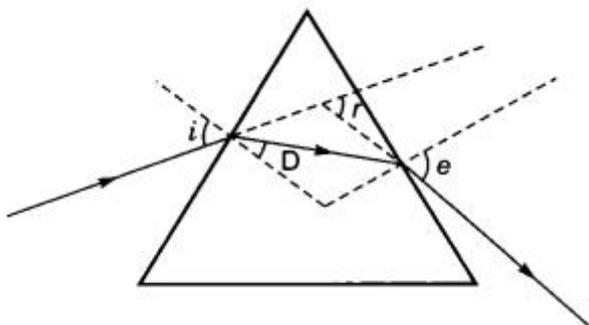


In this diagram the angle of incidence, the angle of emergence and the angle of deviation respectively are (select the correct option):

- (a) X, R and T
- (b) Y, Q and T
- (c) X, Q and P
- (d) Y, Q and P

Question 33.

After tracing the path of a ray of light through a glass prism a student marked the angle of incidence ($\angle i$), angle of refraction ($\angle r$), angle of emergence ($\angle e$) and the angle of deviation ($\angle D$) as shown in the diagram. The correctly marked angles are:



- (a) $\angle i$ and $\angle r$
- (b) $\angle i$ and $\angle e$
- (c) $\angle i$, $\angle e$ and $\angle D$
- (d) $\angle i$, $\angle r$ and $\angle e$

Question 34.

The splitting of white light into its component colours is called

- (a) refraction
- (b) refraction
- (c) dispersion
- (d) tyndall effect

Question 35.

Reason behind advance sunrise and delayed sunset

- (a) atmospheric refraction
- (b) total internal reflection

- (c) dispersion
- (d) reflection

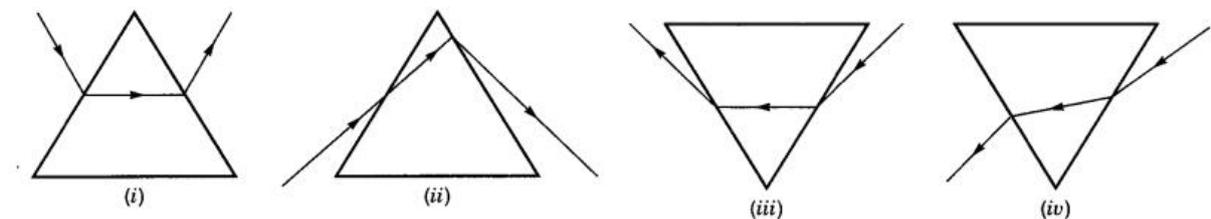
Question 36.

In an experiment to trace the path of a ray of light through a glass prism for different values of angle of incidence a student would find that the emergent ray:

- (a) is parallel to the incident ray
- (b) is perpendicular to the incident ray
- (c) is parallel to the refracted ray
- (d) bends at an angle to the direction of incident ray

Question 37.

While performing the experiment to trace the path of a ray of light passing through a glass prism, four students marked the incident ray and the emergent ray in their diagrams in the manner shown below.



The correct path of the rays has been shown by:

- (a) I
- (b) II
- (c) III
- (d) IV

Question 38.

The splitting of light into its component colours is called

- (a) Spectrum
- (b) Dispersion
- (c) Tyndall effect
- (d) Refraction

Question 39.

Stars appears to be twinkling because of

- (a) atmospheric refraction
- (b) reflection
- (c) Tyndall effect
- (d) spectrum

Question 40.

When a beam of white light falls on a glass prism, the colour of light which will deviate least is:

- (a) Violet
- (b) Red
- (c) Green
- (d) Blue

SECTION -C

Following questions consist of two statements – Assertion (A) and Reason (R).

Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Q.1. Assertion(A) : The centre of curvature is not a part of the mirror. It lies outside its reflecting surface.

Reason (R) : The reflecting surface of a spherical mirror forms a part of a sphere. This sphere has a centre.

Q.2. Assertion (A) : A ray passing through the centre of curvature of a concave mirror after reflection, is reflected back along the same path.

Reason (R) : The incident rays fall on the mirror along the normal to the reflecting surface.

Q.3. Assertion (A) : Light does not travel in the same direction in all the media.

Reason (R) : The speed of light does not change as it enters from one transparent medium to another.

Q.4. Assertion(A) : The emergent ray is parallel to the direction of the incident ray.

Reason (R) : The extent of bending of the ray of light at the opposite parallel faces (air- glass interface and glass-air interface) of the rectangular glass slab is equal and opposite.

Q.5. Assertion(A) : A ray of light travelling from a rarer medium to a denser medium slows down and bends away from the normal. When it travels from a denser medium to a rarer medium, it speeds up and bends towards the normal.

Reason (R) : The speed of light is higher in a rarer medium than a denser medium.