



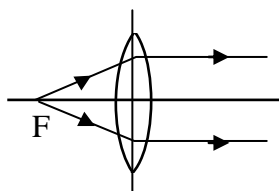
Grade 11

Science

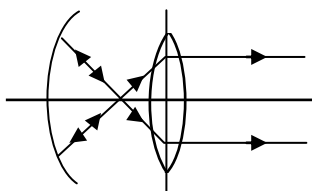
Unit : 05 - Optics

MCQ Questions

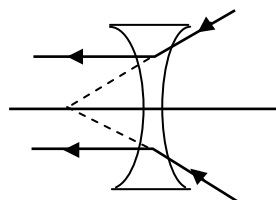
- 1) Which of the following is the incorrect ray diagram.



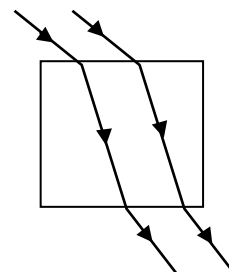
(i)



(ii)

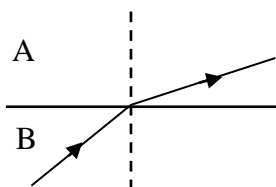


(iii)

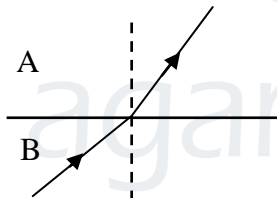


(iv)

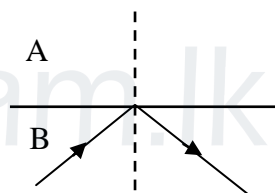
- 2) The critical angle for two media A and B is  $35^\circ$ . Where A is optically rare and B is optically denser. Which of the following correctly illustrate the path of a light ray. (Angle of incidence is  $42^\circ$ )



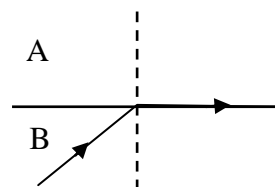
(i)



(ii)



(iii)



(iv)

- 3) Which of the following statement correctly describes the characteristics of the image formed by an object placed in front of a concave mirror and on its focus.

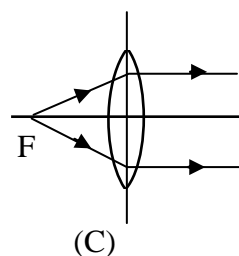
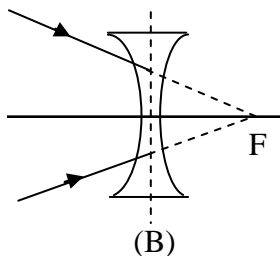
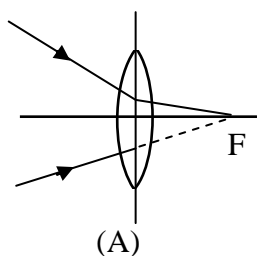
- i) Smaller than the object, erect and real.
- ii) Smaller than the object, inverted and virtual.
- iii) Larger than the object, erect and virtual.
- iv) Larger than the object, erect and real.

- 4) Which is a characteristic of the image formed by an object placed at any point opposite a concave lense.

- i) Magnified
- ii) Real
- iii) inverted
- iv) erect

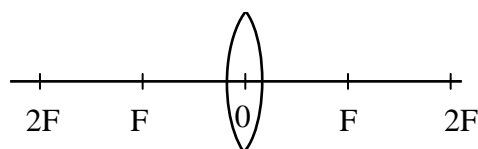
- 5) The head lamp of automobile has a concave reflecting surface. In order to direct light to a greater distance the bulb should be placed
- Between P and f of the concave surface.
  - of f of the concave surface.
  - Between f and C of the concave surface.
  - On C of the concave surface.

- 6) Which of the following setting will give a parallel emergent beam of light.



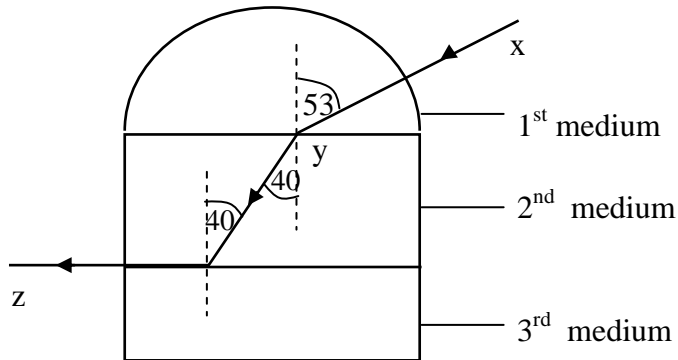
- A and B
  - A and C
  - B and C
  - A, B, C
- 7) What is the best place to keep a hand lens of 20 cm focal length to get best performance as a magnifying lens
- 30cm
  - 10cm
  - 22cm
  - 20cm
- 8) The common feature of plane mirror, concave mirror and convex mirror is,
- Formation of erect image.
  - Formation of virtual image.
  - Formation of image due to reflection of light.
  - Atleast exist one chance that the image is equal to the object.
- 9) An object was placed between F and 2F of a convex lens. Which of the following is not a characteristic of the image formed?

- Image is formed beyond 2F.
- Image is larger than the object
- Image is smaller than the object
- Image is real.



**Structured Essay Questions**

1) i) The decorative item shown in the diagram is made of three different transparent media. The upper part of the item is hemispherical and the center of its circular bottom is y. The diagram shows a light ray coming from air and going through the decorative item.



i) Why is the light ray passing at x without deviation?

.....

ii) Find the refractive index of the second medium relative to the first medium using the data given in diagram.

( $\sin 53^\circ = 0.80$  and  $\sin 40^\circ = 0.64$ )

.....  
 .....

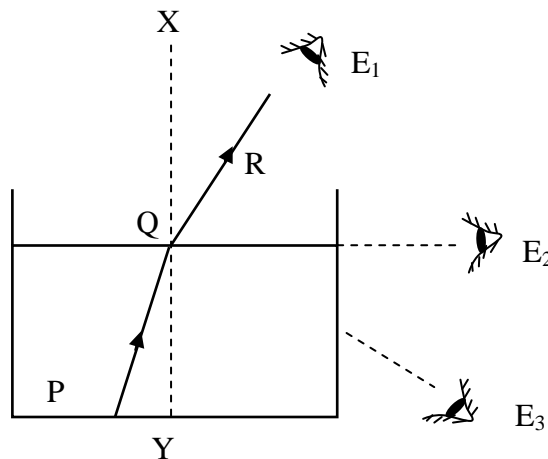
iii) What is the special name given to the angle of incidence at the point z when the light ray falls as shown in the diagram?

.....

iv) What is the name given to the phenomenon undergone by a light ray that falls on z with an angle of the incidence larger than the angle shown in the diagram.

.....

2) Below diagram shows a path of a light ray that emitted by an object at P in a glass tank containing water.



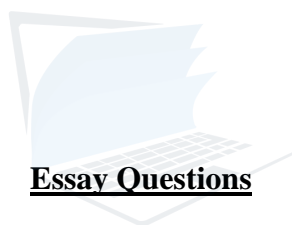
- i) Name the behaviour of the light ray ?.....
- ii) Name the angle of incidence using the letter given .....
- iii) It is observed that the ray QR travels along the water surface, what eye is kept  $E_2$  and the position of the object adjusted. What is the special name used for angle of incidence in the situation.

.....

- iv) If the light ray could be observed by keeping eye at the position  $E_3$ . Name the behaviour of light at that instance.

.....

- v) Draw the ray diagram to show above situation.



### Essay Questions

- 1) Sumudu sees her image from the plane mirror which is in her dressing table.
- What is the quality of the plane mirror that Sumudu is using?
  - Write the two lens separately which is derived from the above quality mentioned on (i)
  - Draw the ray diagram for the light rays which is fall on to a mirror.
  - Name two types of curved mirrors.
  - Draw the types of mirrors mentioned in above (iv) and mark the radius of curvate, pole, and main axis separately.
- 2)
  - What is the meaning of refraction of light.
  - If a light ray moves from a block of glass and then to a layer of water. Draw the ray diagram for the given situation.
  - Write the two laws related to refraction.
  - Derive the incident critical angle using a diagram.
  - Draw and describe how total internal reflection takes place in a prism.