

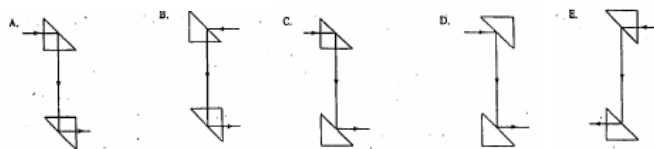
15. 1995/II/13

A magnifying glass is used to read some small print in a book. The glass is placed 3 cm from the book and the magnification is 3. What is the distance between the book and the image of the print?

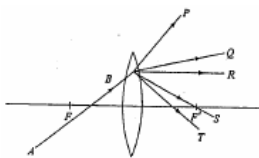
- A. 1 cm B. 3 cm C. 6 cm D. 9 cm E. 12 cm

16. 1995/II/14

Which of the following ray diagrams correctly shows the working principle of a prismatic periscope?



17. 1995/II/16



In the above diagram, F, F' are the foci of the concave lens and AB is an incident ray. Which of the following paths best represents the emergent ray?

- A. P B. Q C. R D. S E. T

18. 1995/II/41

1st statement

The image of an object formed by a concave lens cannot be photographed with a camera.

2nd statement

The image of an object formed by a concave lens cannot be formed on a screen.

19. 1995/II/43

1st statement

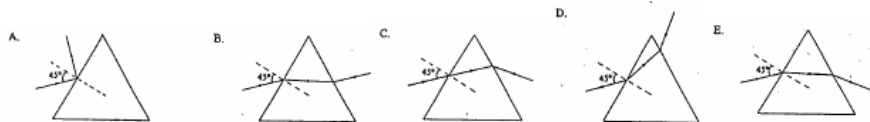
Diffraction of light is more difficult to observe than diffraction of sound.

2nd statement

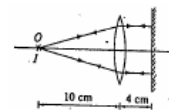
Sound waves are longitudinal but light waves are transverse.

20. 1996/II/14

A ray of red light travels in air and strikes a triangular glass prism at an angle of incidence 45° . The critical angle of red light from the glass is 42° . Which of the following diagrams best shows the path of the ray?



21. 1996/II/15

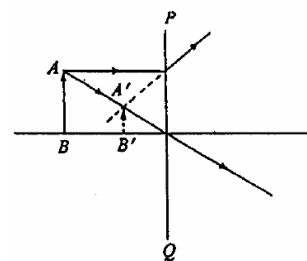


When an object O is placed in front of a convex lens and a plane mirror as shown above, an image I is formed at the same position as the object. Which of the following statements is/are correct?

- (1) The image I is real
- (2) The focal length of the lens is 10 cm
- (3) If the distance between the lens and the plane mirror is changed to 2 cm, the position of the image I remains unchanged.

- A. (1) only B. (3) only C. (1) and (2) only D. (2) and (3) only E. (1),(2) and (3)

22. 1997/II/12



In the above diagram, $A'B'$ is the image of an object AB formed by an optical device PQ . What is PQ ?

- A. a concave mirror (*Out of Syll.*) B. a convex mirror (*Out of Syll.*)
C. a plane mirror D. a concave lens E. a convex lens

23. 1997/II/15

Which of the following phenomena involve(s) total internal reflection of light?

- (1) The sparkling of a diamond
- (2) The formation of a mirage
- (3) A rule appearing bent when dipped in water

- A. (2) only B. (3) only C. (1) and (2) only D. (1) and (3) only E. (1),(2) and (3)

24. 1997/II/41

1st statement

Virtual images cannot be photographed with a camera.

2nd statement

The image formed on the photographic film in a camera is always real.

25. 1997/II/42

1st statement

A convex lens can be used as a magnifying glass.

2nd statement

The image of an object formed by a convex lens is always magnified.

26. 1997/II/43

1st statement

Light is a wave.

2nd statement

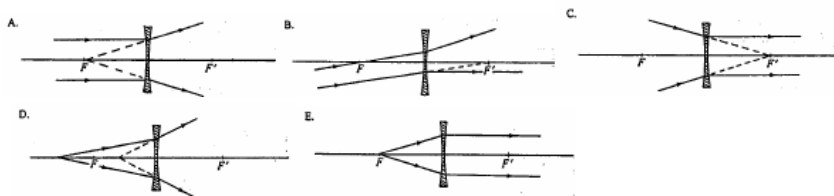
Light can undergo refraction when it travels from one medium to another.

27. 1998/II/14

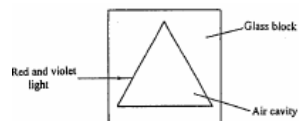
A magnifying glass is used to read some small print in a book. Which of the following statements is correct?

- A. The magnifying glass is a concave lens
- B. The image of the small print is real
- C. The object distance is greater than the focal length of the glass
- D. The image distance is shorter than the object distance
- E. The small print and its image are on the same side of the glass

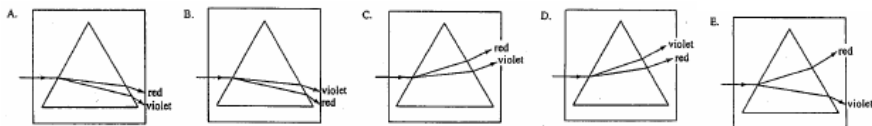
28. 1998/II/15

If F and F' are the foci of the concave lens, which of the following ray diagrams is **incorrect**?

29. 1998/II/16



A beam consisting of red and violet light travels in a glass block with an air cavity. The cavity is in the shape of a prism as shown above. Which of the following diagrams best shows the subsequent path of the beam?



30. 1998/II/18

Which of the following phenomena is/are caused by the refraction of light?

- (1) If a man who is spear-fishing aims his spear at where the fish appears to be, he will miss it.
- (2) A spectrum is formed when white light passes through a prism
- (3) A light ray is transmitted through a curve glass fibre

A. (1) only B. (3) only C. (1) and (2) only D. (2) and (3) only E. (1),(2) and (3)

31. 1998/II/42

1st statement

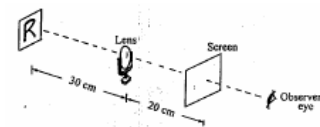
Visible light is a wave.

2nd statement

Visible light can travel through vacuum.

32. 1999/II/11

(For questions 32 and 33) An illuminated letter 'R' is placed in front of a lens as shown below and an image is formed on a translucent screen. The object distance is 30 cm and the image distance is 20 cm.



Which of the following statements is/are correct?

- (1) The lens is a converging lens
- (2) The image is diminished
- (3) The shape of the image seen by the observer is **B**.

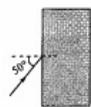
A. (1) only B. (3) only C. (1) and (2) only D. (2) and (3) only E. (1),(2) and (3)

33. 1999/II/12

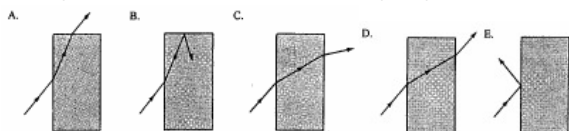
If a piece of paper is used to cover one-half of the lens, which of the following describes the change in the image as seen by the observer?

- A. The whole image can still be seen but the image becomes dimmer.
- B. The whole image can still be seen and its brightness remains unchanged.
- C. Only half of the image can be seen and the image becomes dimmer.
- D. Only half of the image can be seen but its brightness remains unchanged.
- E. The whole image disappears.

34. 1999/II/13



A ray of light travels in air and strikes a rectangular glass block at an angle of incidence 50° . The critical angle of the glass is 42° . Which of the following diagrams best shows the path of the ray?



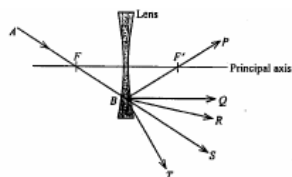
35. 1999/II/15

Which of the following statements concerning virtual images is/are correct?

- (1) Virtual images are always diminished
- (2) Virtual images can be photographed with a camera
- (3) Virtual images cannot be formed on a screen

A. (1) only B. (3) only C. (1) and (2) only D. (2) and (3) only E. (1),(2) and (3)

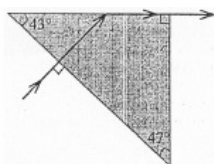
36. 2000/II/15



F and F' are foci of the above lens and AB is an incident ray. Which of the following paths best represents the emergent ray?

A. P B. Q C. R D. S E. T

37. 2000/II/16



A ray of light enters a glass prism and travels along the path as shown above. Find the refractive index of the glass.

A. 0.68 B. 1.07 C. 1.37 D. 1.47 E. 1.50

38. 2000/II/18



A student uses two triangular prisms to construct a periscope as shown above. Which of the following shows the image of the object as seen by the observer?

A. ↓ B. ↑ C. ↘ D. ↗ E. ↖↗

39. 2000/II/43

1st statement

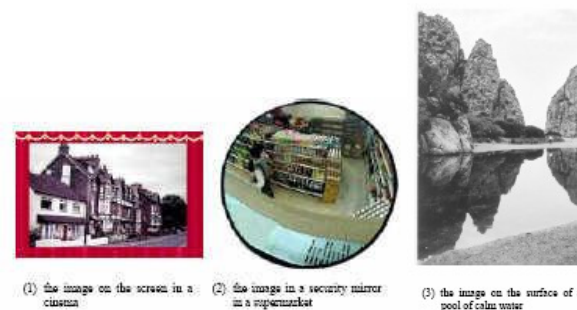
Without a screen, a real image cannot be seen by an observer.

2nd statement

The image of an object formed on a screen is always real.

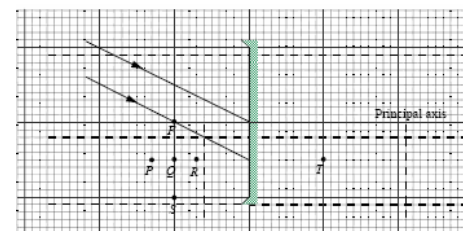
40. 2001/II/13

Which of the following images in the photographs is/are virtual?



A. (1) only B. (3) only C. (1) and (2) only D. (2) and (3) only E. (1),(2) and (3)

41. 2001/II/14



Two parallel rays from a distant object strike a concave mirror as shown above, where F is the focus. At which of the following points does the image of the object form?

A. P B. Q C. R D. S E. T

42. 2001/II/43

1st statement

When a lens is used as a magnifying glass to look on a small object, the image formed is real.

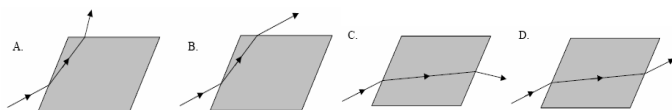
2nd statement

When a lens is used as a magnifying glass, the object and the image formed are on different sides of the lens.

43. 2002/II/14



A ray of light travels in air and strikes a glass block as shown above. Which of the following diagrams best shows the path of the ray?

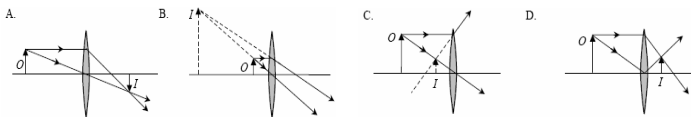


44. 2002/II/17

(For Questions 44 and 45.) A cup is placed in front of a window, outside which is a distant building. Two photos P_1 and P_2 as shown below are taken with the same single-lens camera.

Photo P_1 Photo P_2

Which of the following ray diagrams correctly shows how the image I of the cup O is formed by the lens of the camera in photo P_1 ?



45. 2002/II/18

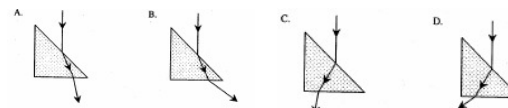
Which of the following statements about the two photos must be correct?

- A. In P_1 , the images of the cup and the building are on different sides of the lens of the camera.
- B. In P_1 , the image of the cup is real while that of the building is virtual.
- C. On taking P_2 , the distance between the lens and the film of the camera is shorter than that on taking P_1 .
- D. After taking P_1 , the photographer has to move forward in order to take P_2 .

46. 2003/II/13



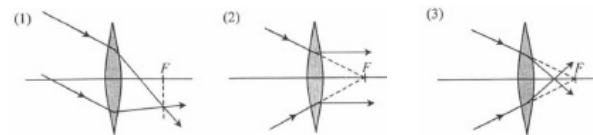
A ray of light travels in air and strikes a glass prism as shown above. Which of the following diagram best shows the path of the ray?



47. 2003/II/15

Which of the following ray diagrams concerning the refraction of light ray by a converging lens is/are incorrect?

F denotes the focus of the lens



- A. (2)
- B. (3)
- C. (1) and (2) only
- D. (1) and (3) only

48. 2003/II/16



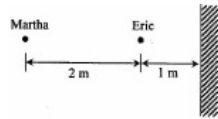
The photograph shows a student using a magnifying glass of focal length 20 cm to view a distant object.

Which of the following statements about the image formed is/are correct?

- (1) The image will be erect
- (2) The image will be diminished
- (3) The student must use a screen in order to see the image.

- A. (1) only
- B. (2) only
- C. (1) and (3) only
- D. (2) and (3) only

49. 2004/II/13



Eric stands 1 m in front of a plane mirror. Martha stands 2 m behind Eric as shown above. Find the distance between Eric and the image of Martha formed by the mirror.

- A. 2 m B. 3 m C. 4 m D. 6 m

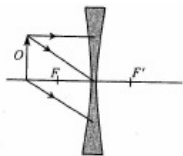
50. 2004/II/14



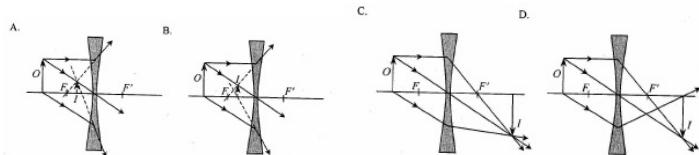
The photograph shows the image of a tree formed by the surface of a pool of calm water. Which of the following phenomena explains the formation of the image?

- A. reflection B. total internal reflection C. refraction D. diffraction

51. 2004/II/16



An object O is placed in front of a concave lens. F and F' are the foci of the lens. Which of the following diagrams shows the refracted rays of the three incident rays and the image I formed?



52. 2004/II/17



The photograph shows a watch with a lens positioned over the date-display.

Which of the following statements are correct?

- (1) The lens is a convex lens
 (2) The image of the date-display formed by the lens is virtual
 (3) The date-display and its image lie on the same side of the lens
- A. (1) and (2) only B. (1) and (3) only C. (2) and (3) only D. (1), (2) and (3)

53. 2004/II/45

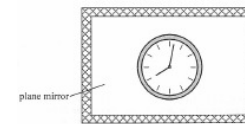
1st statement

When light travels from air to glass, its wavelength decrease.

2nd statement

When light travels from air to glass, its frequency decreases.

54. 2005/II/10



The diagram shows the image of a clock formed in a plane mirror. What is the time displayed by the clock at this instant?

- A. 3:58 B. 4:02 C. 8:58 D. 8:02

55. 2005/II/11



Cecilia uses a magnifying glass to read some small print. Which of the following diagrams shows how the image of the print is formed?

