PHYSICS

BOOKS - ZEN PHYSICS (KANNADA ENGLISH)

LIGHT - REFLECTION AND REFRACTION

Questions Section In Text Questions

1. Define the principal focus of a concave mirror.

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2. The radius of curvature of a spherical mirror is 20 cm. What is its focal length ?

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3. Name a mirror that can give an erect and eniarged image of an object.

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4. Why do we prefer a convex mirror as a rear - view mirror in vehicles ?

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5. Find the focal length of a convex mirror whose radius of curvature is 32 cm.

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6. A concave mirror produces three times magnified (enlarged) real image of an object placed at 10 cm front of it. Where is the image located ?

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7. A ray of light travelling in air enters obliquely into water. Does the light ray bend towards the normal or way from the normal ? Why ?

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8. Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass ? [The speed of light in vacuum is $3 \times 10^8 ms^{-1}$].

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9. You are given kersoene, turpentine and water. In which of these does the light travel

fastest ? [The refractive indices of Kerosene is 1.44 , Water is 1.33 , Turpentine oil is 1.47].

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10. The refractive index of diamond is 2.42. What is the meaning of this statement ?

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11. Define I dioptre of power of a lens ?

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12. A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the convec lens if the image is equal to the size of the object ? Also, find power of the lens.

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13. Find the power of a concave lens of focal length 2 m.

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14. Define the principal focus of a concave mirror.

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26. Find the power of a concave lens of focal length 2 m.

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Questions Section Textual Exercise

1. Which one of the following materials cannot be used to make a lens ?

A. Water

B. Glass

C. Plastic

D. Clay

Answer: D

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2. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object ?

A. Between the principal focus and the centre of curvature

B. At the centre of curvature

C. Beyond the centre of curvature

D. Between the pole of the mirror and its principal focus.

Answer: D

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3. Where should an object be placed in front of a convec lens to get real image of the size of the object ?

A. At the principal focus of the lens

B. At twice the focal length

C. At infinity

D. Between the optical centre of the lens and its principal focus.

Answer: B

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4. A spherical mirror and a thin spherical lens have each a focal length of - 15 cm. The mirror and the lens are likely to be

A. both concave

B. both convex

C. the mirror is concave and the lens is convex

D. the mirror is convex, but the lens is concave

Answer: A

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5. No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be .....

A. only plane

B. only concave

C. only convex

D. either plane or convex

Answer: D

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6. Which of the following lenses would you prefer to use while reading small letters found in a dictionary ?

A. A convex lens of focal length 50 cm

B. A concave lens of focal length 50 cm.

C. A convex lens of focal length 5 cm.

D. A concave lens of focal length 5 cm

Answer: C

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7. We wish to obtain an erect image of an object, using a concave mirror of focal length 15 cm. What should be the range of distance

of the object from the mirror ? What is the nature of the image ? Is the image larger or smaller than the object ? Draw a ray diagram to show the image formation in this case.

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8. Name the type of mirror used in the following situations.

(a) Headlights of a car.

(b) Side/rear - view mirror of a vehicle.

(c) Solar furnace.

Support your answer with reason.

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9. One - half of a convex lens is convered with a black paper. Will this lens produce a complete image of the object ? Verify your answer experimentally. Explain your observations.

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10. An object 5 cm in length is held 25 cm away a converging lens of focal length 10 cm. Draw the ray diagram and find the position, size and nature of the image formed.

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14. An object 5.0 cm in length is placed at a distance of 20 cm in front of a convex mirror of radius of curvature 30 cm. Find the position of the image, its nature and size.

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15. An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focused

image can be obtained ? Find the size and the nature of the image.

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16. Find the focal length of a lens pf power -2.0 D. What type of lens is this ?

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Is the prescribed lens diverging or converging ?

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18. Which one of the following materials cannot be used to make a lens ?

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D. Between the pole of the mirror and its principal focus.

Answer: D

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B. At twice the focal length

C. At infinity

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Answer: B

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21. A spherical mirror and a thin spherical lens have each a focal length of - 15 cm. The mirror and the lens are likely to be

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Zen Additional Questions Section Multiple Choice Questions

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

A. Concave mirror as well as convex lens

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

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

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B. very near to the focus of the reflector

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D. at the centre of curvature of the reflector

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5. 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

Answer: C

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6. The speed of light in vacuum is

A. $3 \times 10^{6} m / s$

B. $3 \times 10^{-8} m / s$

C. $3 \times 10^{8} m / s$

D. $3 \times 10^{8} m / s$

Answer: C

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7. Virtual images formed by a convex mirror are always .....

A. Upright and Diminished

B. Inverted and Diminished

C. Upright and Enlarged

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Answer: A

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8. Which of these can be used to obtain a real image having the same size as the object ?

A. Only a concave mirror

B. Convex mirror and Concave lens

C. Concave mirror and Convex lens

D. Concave mirror and Concave lens

Answer: C

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9. The distant object method can be used to find the focal length of which of the following ?

A. Only a convex lens

B. Convex mirror and Convex lens

C. Concave mirror and Convex lens

D. Concave mirror and Concave lens

Answer: C

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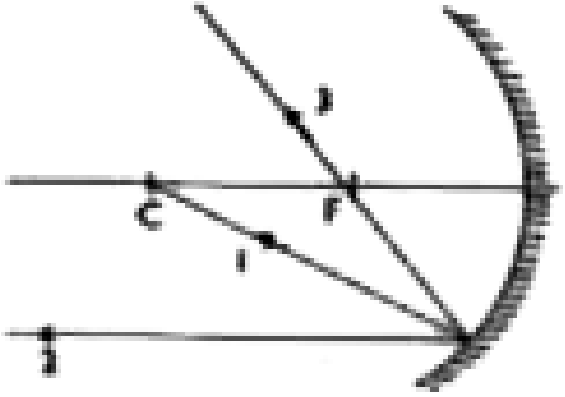
10. A light ray is incident on a concave mirror which passes through the centre of curvature of a concave mirror. Which of these rays indicates the reflected ray ?



A. Only ray 1

B. Ray 1 and 2

C. Ray 2

D. Ray 3

Answer: A

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11. When a biconvex lens made of glass is immersed in a liquid which is optically denser than glass then the lens serves as a :

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C. Plano concave lens

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Answer: B

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12. The power of a spherical lens is given by :

A. $\frac{l}{P} = \frac{l}{\text{f(in metre)}}$

B. $P = \frac{l}{\text{f(in centimetre)}}$

C. $P = \frac{l}{\text{f(in metre)}}$

D. $P - f = l$

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13. When a concave lens made of glass is kept in a liquid which has greater refractive index than glass then the lens behaves like a :

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C. Plane mirror

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14. An object is kept 15 cm in front of a concave lens of focal length 20 cm. If the object is moved by 3 cm towards the lens, by what factor will the magnifiation change ?

A. 20/19

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Answer: C

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15. The nature and size of an object placed focus F_1 of a convex lens is :

A. Virtual and erect, enlarged , image formed at F_2

B. Real and inverted, diminished , image formed at F_2

C. Real and inverted, diminished , image formed at F_1

D. Real and inverted, enlarged , image formed at ∞

Answer: B

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16. The power of a concave lens of focal length 50 cm is :

A. $+2D$

B. $+0.02D$

C. $-0.02D$

D. $-2D$

Answer: D

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17. u, v, f and r represents the object distance, image distance, focal length and radius of curvature of a mirror respectively. Which of these relations is correct ?

A. $\frac{r}{2} = \frac{uv}{u+v}$

B. $f = \frac{uv}{u-v}$

C. $f = \frac{u+v}{uv}$

D. $f = \frac{u-v}{uv}$

Answer: A

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21. The relation between refractive index of a medium (μ) in terms of velocity of light in medium (v) is given by :

A. $\mu = vc$

B. $\mu = 1/vc$

C. $\mu = v/c$

D. $\mu = c/v$

Answer: D

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22. The bending of a light ray due to change in velocity of light as the medium changes is called :

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B. Refraction

C. Total internal reflection

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Answer: B

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23. To form an image twice the size of the object, using a convex lens of focal length 20 cm, the object distance must be

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B. Teeth is placed at the curvature of the mirror

C. Teeth is placed between the focus and the pole of the concave mirrror

D. Teeth is placed beyond the centre of curvature of the concave mirror

Answer: C

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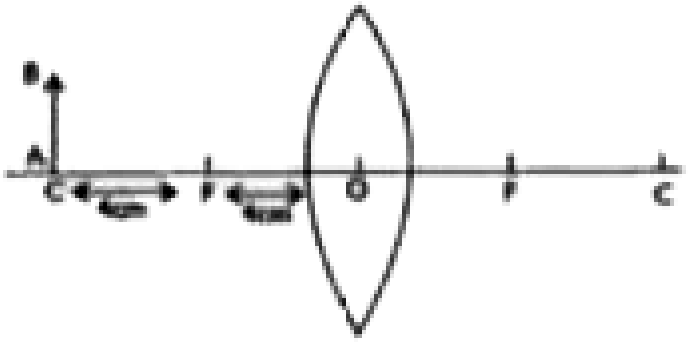
26. In the figure, AB is an object of height 2 cm. The position and height of the image formed are :



A. At C and 4 cm

B. At F and 4 cm

C. At C and 2 cm

D. Beyond C and 2 cm

Answer: C

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27. Concave mirrors are used as reflectors in the headlights of vehicles, torch lights. Where is the bulb placed ?

A. In between the pole and the focus

B. At the centre of curvature

C. At the focus

D. Anywhere between C and F

Answer: C

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28. Which of these is true about the value of linear magnification $(|m|)$ of a convex mirror ?

A. $|m| = i$

B. $|m| > l$

C. $|m| \geq l$

D. $|m| < 1$

Answer: D

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29. The refractive index of a given pair of media is independent on which of these factors given below.

A. Wavelength of the light used

B. Nature of the media

C. Angle of incidence

D. Colour of the light ray

Answer: C

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30. A student has obtained a point image of a distant object using a convex lens. To find the focal length of the convex lens, he should measure the distance between the :

A. Convex lens and the object

B. Convex lens and the screen

C. Object and the screen

D. Convex lens and the object and also between the object and the screen

Answer: B

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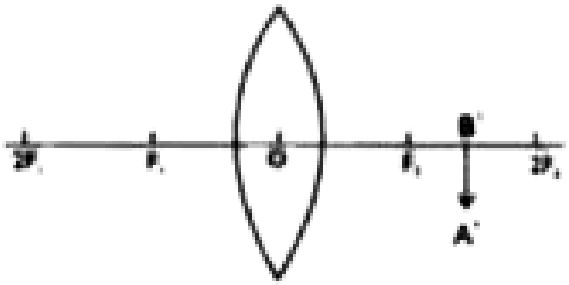
31. In the incomplete ray diagram given below, the object AB would be at the position



A. Beyond $2F_1$

B. At infinity

C. Between $2F_1$ and F_1

D. At $2F_2$

Answer: A

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32. Two lenses of power +3.5 D and - 2.5 D are placed in contact. The lens in the combination set up acts like a

A. Concave lens

B. Convex lens

C. Glass slab

D. Concave mirror

Answer: B

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33. To obtain a diminished image of an object from a concave mirror, position of the object should be

A. between C and F

B. beyond C

C. between P and F

D. at F

Answer: B

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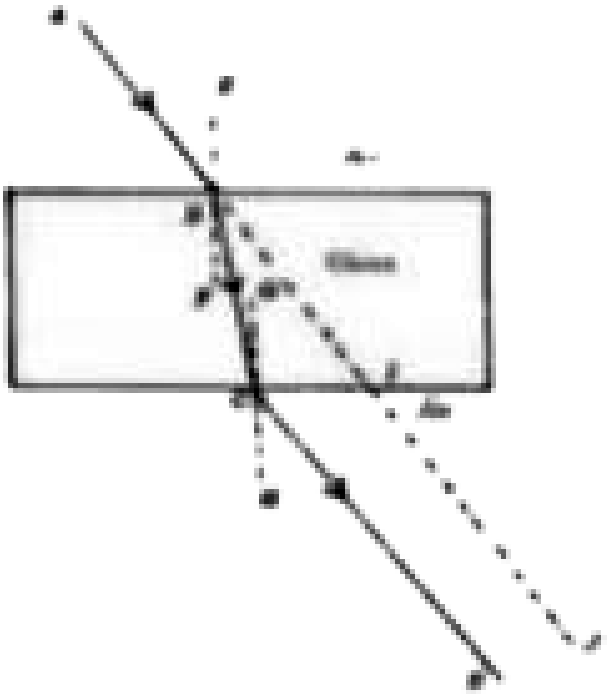
34. Identify the emergent ray in the given figure



A. CD

B. BC

C. AB

D. l

Answer: A

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35. An object is kept at the centre of curvature of a concave mirror. The position and nature of the image formed is

A. between F and C and inverted

B. behind the mirror and erect

C. between F and P and erect

D. at the centre of curvature and inverted

Answer: D

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

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C. Two plane mirrors placed at 90° to each other

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B. $3 \times 10^{-8} m / s$

C. $3 \times 10^{8} m / s$

D. $3 \times 10^{8} m / s$

Answer: C

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42. Virtual images formed by a convex mirror are always .....

A. Upright and Diminished

B. Inverted and Diminished

C. Upright and Enlarged

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43. Which of these can be used to obtain a real image having the same size as the object ?

A. Only a concave mirror

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C. Concave mirror and Convex lens

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Answer: C

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A. Only a convex lens

B. Convex mirror and Convex lens

C. Concave mirror and Convex lens

D. Concave mirror and Concave lens

Answer: C

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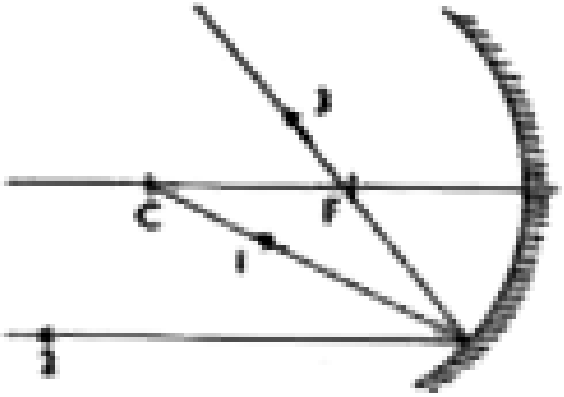
45. A light ray is incident on a concave mirror which passes through the centre of curvature of a concave mirror. Which of these rays indicates the reflected ray ?



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A. $\frac{l}{P} = \frac{l}{\text{f(in metre)}}$

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A. Converging lens

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C. Plane mirror

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C. 35/32

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50. The nature and size of an object placed focus F_1 of a convex lens is :

A. Virtual and erect, enlarged , image formed at F_2

B. Real and inverted, diminished , image formed at F_2

C. Real and inverted, diminished , image formed at F_1

D. Real and inverted, enlarged , image formed at F_2

Answer: B

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51. The power of a concave lens of focal length 50 cm is :

A. $+2D$

B. $+0.02D$

C. $-0.02D$

D. $-2D$

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52. u, v, f and r represents the object distance, image distance, focal length and radius of curvature of a mirror respectively. Which of these relations is correct ?

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B. Direction of light ray

C. Wavelength

D. Frequency

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C. bending of light does not occur

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A. $\mu = vc$

B. $\mu = 1/vc$

C. $\mu = v/c$

D. $\mu = c/v$

Answer: D

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57. The bending of a light ray due to change in velocity of light as the medium changes is called :

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B. Refraction

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D. equal to 40 cm

Answer: A

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59. The combination of a convex lens and a concave lens each of focal length 10 cm acts like a :

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B. Diverging lens

C. Glass slab

D. Glass prism

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60. A dentist uses a concave mirror to examine the teeth. The position of the concave mirror is adjust such that the teeth in which position ?

A. Teeth is at the focus of the concave mirror

B. Teeth is placed at the curvature of the mirror

C. Teeth is placed between the focus and the pole of the concave mirrror

D. Teeth is placed beyond the centre of curvature of the concave mirror

Answer: C

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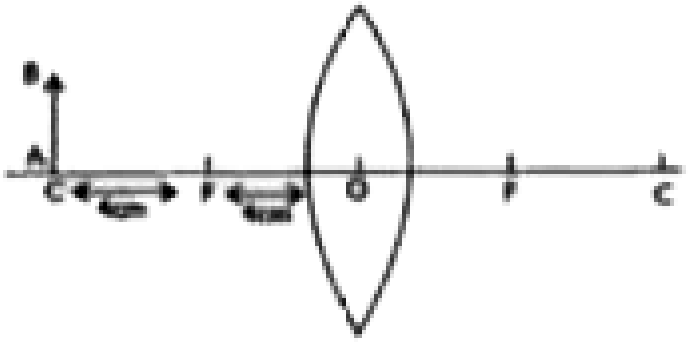
61. In the figure, AB is an object of height 2 cm. The position and height of the image formed are :



A. At C and 4 cm

B. At F and 4 cm

C. At C and 2 cm

D. Beyond C and 2 cm

Answer: C

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62. Concave mirrors are used as reflectors in the headlights of vehicles, torch lights. Where is the bulb placed ?

A. In between the pole and the focus

B. At the centre of curvature

C. At the focus

D. Anywhere between C and F

Answer: C

Watch Video Solution

63. Which of these is true about the value of linear magnification $(|m|)$ of a convex mirror ?

A. $|m| = i$

B. $|m| > l$

C. $|m| \geq l$

D. $|m| < 1$

Answer: D

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64. The refractive index of a given pair of media is independent on which of these factors given below.

A. Wavelength of the light used

B. Nature of the media

C. Angle of incidence

D. Colour of the light ray

Answer: C

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65. A student has obtained a point image of a distant object using a convex lens. To find the focal length of the convex lens, he should measure the distance between the :

A. Convex lens and the object

B. Convex lens and the screen

C. Object and the screen

D. Convex lens and the object and also between the object and the screen

Answer: B

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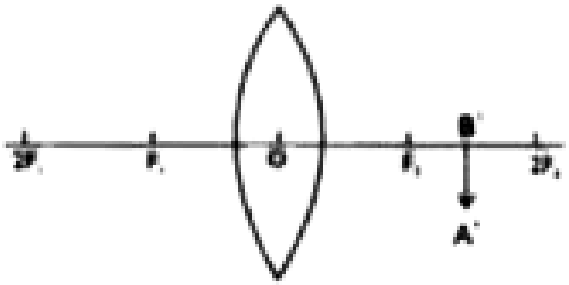
66. In the incomplete ray diagram given below, the object AB would be at the position



A. Beyond $2F_1$

B. At infinity

C. Between $2F_1$ and F_1

D. At $2F_2$

Answer: A

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67. Two lenses of power +3.5 D and - 2.5 D are placed in contact. The lens in the combination set up acts like a

A. Concave lens

B. Convex lens

C. Glass slab

D. Concave mirror

Answer: B

Watch Video Solution

68. To obtain a diminished image of an object from a concave mirror, position of the object should be

A. between C and F

B. beyond C

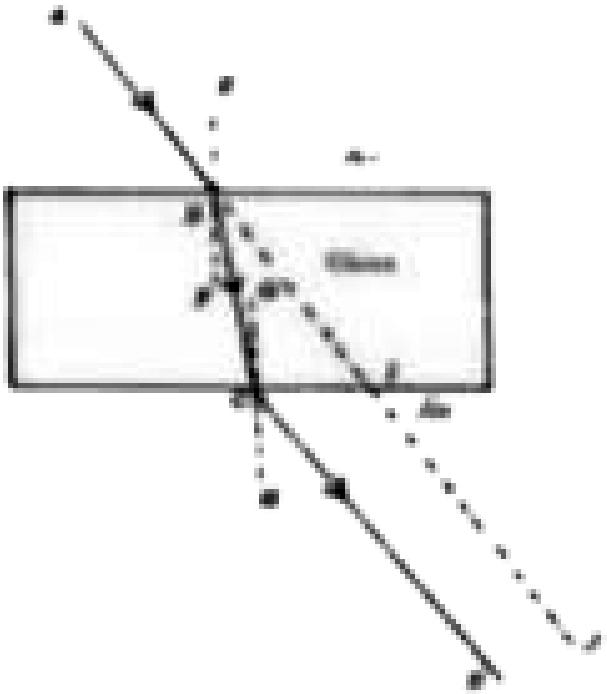
C. between P and F

D. at F

Answer: B

Watch Video Solution

69. Identify the emergent ray in the given figure



A. CD

B. BC

C. AB

D. l

Answer: A

Watch Video Solution

70. An object is kept at the centre of curvature of a concave mirror. The position and nature of the image formed is

A. between F and C and inverted

B. behind the mirror and erect

C. between F and P and erect

D. at the centre of curvature and inverted

Answer: D

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Zen Additional Questions Section Very Short Answer Type Questions Vsa

1. What is the minimum distance between an object and its real image in the case of a concave mirror ?

Watch Video Solution

2. Why does ray of light passing through the centre of curvature of a concave mirror gets reflected along the same path (ray retraces its path) ?

Watch Video Solution

3. When a light ray is incident normally on a mirror. What is its angle of reflection ?

Watch Video Solution

4. What is the relation between focal length of a spherical mirror and its radius of curvature ?

Watch Video Solution

5. Express the relation between the power (P) and the focal length of a lens.

Watch Video Solution

6. List the important factor on which the ability of a lens to converge or diverge light

rays depends on ?

Watch Video Solution

7. A light ray travelling from medium 1 to medium 2, does not suffer refraction. List down all the conditions which support this occurrence.

Watch Video Solution

8. What do you understand from the term 'Refractive index' of a medium or a substance ?

Watch Video Solution

9. Lens X has focal length 20 cm and lens Y has focal length 40 cm. Which lens would you select to obtain a more convergent beam of light ?

Watch Video Solution

10. Concave mirrors A and B each focal length - 15 cm. Concave mirror A has a larger aperture than B. Which of these will form a sharper image ? Why ?

Watch Video Solution

11. A convex lens has a focal length 15 cm. A student obtains a clear sharp image of an object by placing it at 20 cm distance from the lens. At what distance approximately will he obtain an image of magnification - l ?

Watch Video Solution

12. Can we find the focal length of a concave lens using the distant object method ? Give reasons.

View Text Solution

13. A concave mirror is dipped in vessel containing kerosene. Will this affect the focal length of the concave mirror ? Justify.

View Text Solution

14. What is the kind of mirror used by an ENT specialist to examine the ears of a patient ?

View Text Solution

15. A convex lens is immersed in a container of water. Will this cause a change its focal length ?

Watch Video Solution

16. When a light ray emerges out after refraction at a rectangular glass slab, it is parallel to the incident ray. Why ?

Watch Video Solution

17. Define the following terms in the context of spherical mirrors :

(i) Pole

(ii) Centre of curvature

(iii) Radius of curvature

(iv) Principal axis

(v) Principal focus

Watch Video Solution

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(iii) Radius of curvature

(iv) Principal axis

(v) Principal focus

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Zen Additional Questions Section Short Answer Sa Type I Questions

1. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine. Support your answer with reason.

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2. Refractive index in diamond with respect to glass is 1.6 and absolute refractive index of

glass is 1.5. Find out the absolute refractive index of diamond.

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3. Draw a ray diagram showing the path of rays of light when it enters with oblique incidence (i) from air into water , (ii) from water into air.

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4. State the laws of reflection.

Watch Video Solution

5. The magnification of the image produced by a plane mirror is $+1$. Given reasons.

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6. What are the factors on which refractive index depends ?

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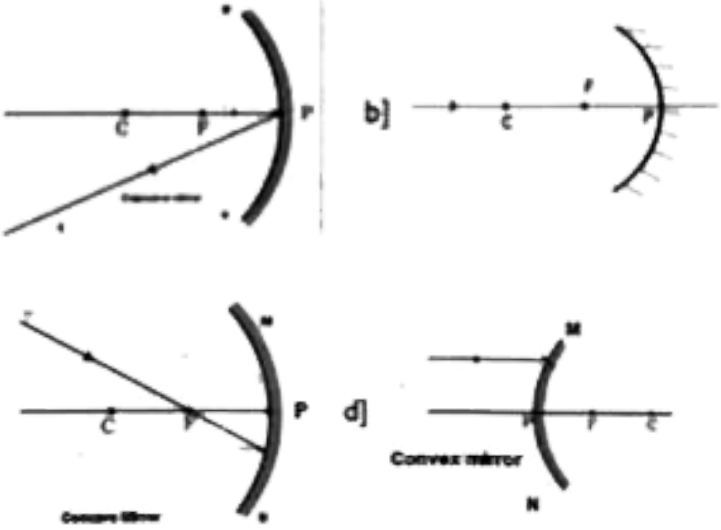
7. Is it possible for a convex lens kept in one medium to act like a diverging lens when placed in medium ? Given reason.

Watch Video Solution

8. Complete the ray diagrams by drawing the incident ray or the reflected ray for the following figures.



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9. What happens to the size of the image when the object is brought from infinity closer to (a) concave lens (b) convex lens ?

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10. You may have noticed that side rear view mirrors on vehicles say "Objects seen in the mirror are closer than they appear". Why is this message etched on the side mirror ?

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11. The refractive of three media are given below :

Medium	A	B	C
Refractive index	1.65	1.71	1.47

A light ray travels from medium A to medium B

and another light ray travels from medium B to medium C. In which case does (a) the refracted ray bend towards the normal (b) the speed of light will be more.

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12. List down the factors on which the lateral displacement of a light ray which emerges out from a rectangular glass slab depends.

Watch Video Solution

13. Define reflection and refraction of light.

Watch Video Solution

14. Define linear magnification of an object. Write the expression for the same.

Watch Video Solution

15. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of

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Watch Video Solution

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Watch Video Solution

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Watch Video Solution

20. What are the factors on which refractive index depends ?

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21. Is it possible for a convex lens kept in one medium to act like a diverging lens when

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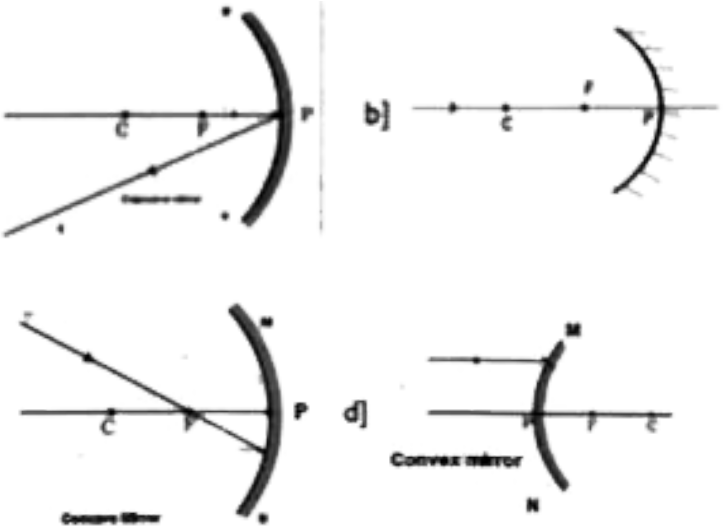
Watch Video Solution

22. Complete the ray diagrams by drawing the incident ray or the reflected ray for the following figures.



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27. Define reflection and refraction of light.

Watch Video Solution

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Zen Additional Questions Section Short Answer Sa Type Ii Questions

1. How is the refractive index of a medium related to the speed of light ? Obtain an expression for refractive index of a medium

with respect to another in terms of speed of light in these two media ?

Watch Video Solution

2. Distinguish between real and virtual images.

Watch Video Solution

3. List the characteristics of image formed in a plane mirror.

Watch Video Solution

4. You are given a plane mirror, a concave mirror and a convex mirror. How do you distinguish each of them ?

Watch Video Solution

5. An object of height 4 cm is placed at a distance of 30 cm from the optic centre of a convex lens of focal length 20 cm. Draw a ray diagram to find the position and size of the

image formed. Mark the optic centre O and the principal focus F on the diagram. Also find the approximate ratio of the size of the image to the size of the object.

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6. What is meant by power of a lens ? Write its Sl unit. A student uses a lens of focal length 40 cm and another of - 20 cm. Write the nature and power of each lens.

Watch Video Solution

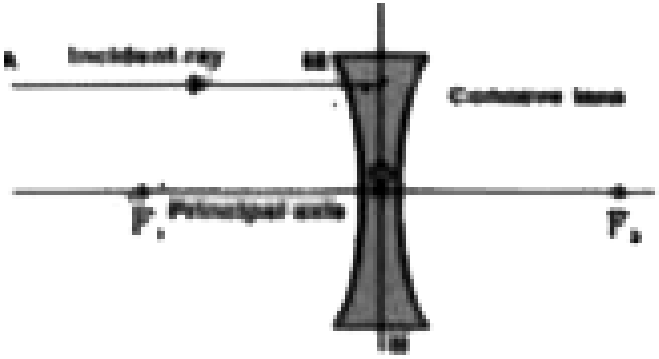
7. State the laws of refraction of light. Explain the term 'Absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum.

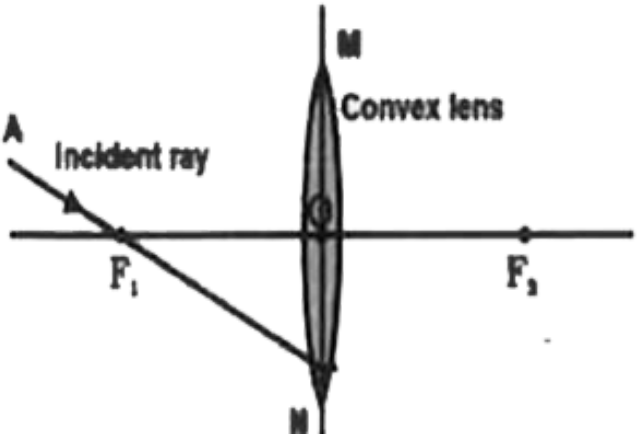
Watch Video Solution

8. How can a plane mirror, concave mirror, and/or convex mirror be used to produce an image that has the same size as the object ?

Watch Video Solution

9. (i) Redraw the diagram shown and complete the path of the ray diagram.





(ii) What is the difference between the virtual

images produced by plane mirror, convex mirror and concave mirrors ?

(iii) What does the negative sign in the value of magnification produced by a mirror indicate about a image ?

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10. Explain why a tank filled with water or swimming pool looks shallower. Explain with the help of a ray diagram.

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11. A light ray is incident at an angle of 60° at the interface of Medium X and medium Y air - water interface. If the angle of refraction is 30°.

(i) Draw a diagram to represent the same.

(ii) Find the refractive index of the Y with respect to medium X.

(iii) If medium Y has a refractive index equal to 4/3, will the angle of refraction increase or decrease ?

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12. A material medium X has a refractive index 1.5 and another medium Y has a refractive index of 1.44.

(a) Calculate the velocity of light in each of these media.

(b) In which medium will travel faster ?

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13. Mention any three differences between reflection and refraction of light.

Watch Video Solution

14. List any three differences between convex lens and concave lens.

Watch Video Solution

15. Mention any three differences between convex mirror and concave mirror.

Watch Video Solution

16. Explain the following terms related to spherical lenses :

(i) Centers of curvature

(ii) Principal axis

(iii) Optic centre

(iv) Radii of curvature

(v) Principal focus

(vi) Focal length and

(vii) Linear aperture.

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17. An object is kept on the principal axis of a concave mirror of focal length 12 cm. If the object is at a distance of 18 cm from the mirror, calculate the image distance. Determine the nature of the image formed by calculating the magnification produced by the mirror.

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18. How is the refractive index of a medium related to the speed of light ? Obtain an expression for refractive index of a medium with respect to another in terms of speed of light in these two media ?

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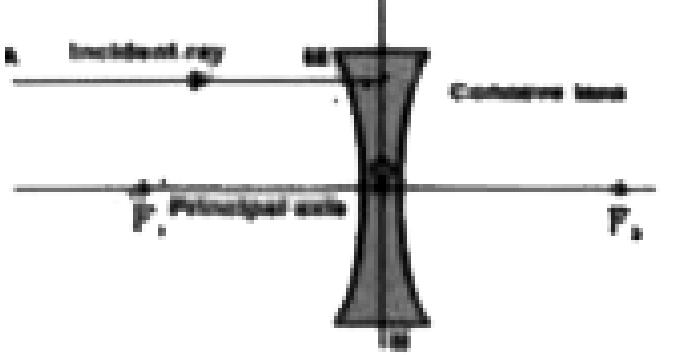

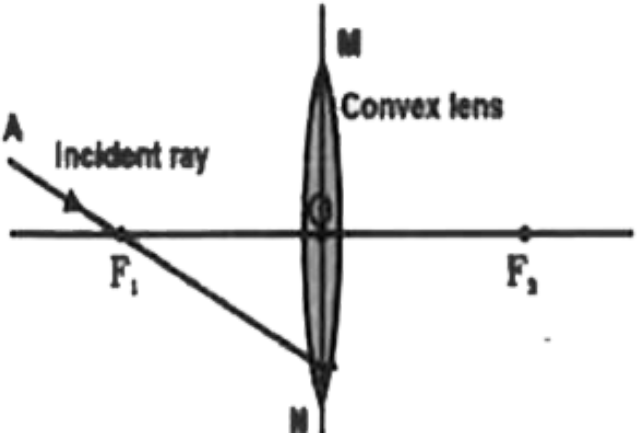

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(v) Principal focus

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Zen Additional Questions Section Long Answer La Questions

1. Draw ray diagrams showing the image formation by a concave mirror when an object is placed.

(a) between pole and focus of the mirror

(b) between focus and centre of curvature of the mirror

(c) at centre of curvature of the mirror

(d) a little beyond centre of curvature of the mirror

(e) at infinity

View Text Solution

2. Draw ray diagrams showing the image formation by a convex lens when an object is placed

(a) between optical centre and focus of the lens

(b) between focus and twice the focal length of the lens

OR

Draw the ray diagram when the object is kept between F_1 and $2F_1$ of the convex lens. With the help of the diagram mention the position and nature of the image formed. [F_1 : Principal

focus of the lens]

(c) at twice the focal length of the lens

(d) at infinity

(e) at the focus of the lens

Watch Video Solution

3. Write laws of refraction. Explain the same with the help of ray diagram, when a ray of light passes through a rectangular glass slab.

Watch Video Solution

4. Draw ray diagram showing the image formation by a concave lens when an object is placed

(a) at the focus of the lens

(b) between focus and twice the focal length of the lens

(c) beyond twice the focal length of the lens

Watch Video Solution

5. Draw ray diagrams showing the image formation by a convex mirror when an object

is placed

(a) at infinity

(b) at finite distance from the mirror

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6. Suppose you have three concave mirrors A, B, C of focal lengths 10 cm, 15 cm and 20 cm. For each of these concave mirrors, you perform the experiment of image formation for three values of object distance of 10 cm, 20 cm and 30 cm. Answer the following reasons.

(a) Identify the mirror/mirrors with linear magnification - 1.

(b) Out of the three mirrors, identify the mirror which would be preferred to be used for shaving purposes/makeup.

(c) For the mirror B, draw ray diagram for image formation for object distance 10 cm and 20 cm.

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7. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it ? Draw a labelled diagram to support your answer.

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8. Where is this mirror used and why ?

View Text Solution

9. Define the radius of curvature of a spherical mirror. Find the nature and focal length of a spherical mirror whose radius of curvature is 24 cm.

Watch Video Solution

10. Analyse the observation table which shows variation of image distance [v] with object distance [u] in the case of a convex lens. Answer the questions that follow without doing any calculations.

Sl.No	Object distance u [cm]	Image distance v [cm]
1	-90	$+18$
2	-60	$+20$
3	-30	$+30$
4	-20	$+60$
5	-18	$+90$
6	-10	$+100$

(a) What is the focal length of the convex lens ? Given reasons to support your answer.

(b) Write the Sl.No of the observation which is not correct.

How did you arrive at this conciusion ?

(c) Use an appropriate scale to draw the ray diagram for the observation at Sl. No 4 and find the approximate value of magnification.

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11. To find the image - distance for varying object - distance in the case of a convex lens, a student obtains on screen a sharp image of a bright object placed very far from the lens. After that the gradually moves the object towards the lens and each time focuses its image on the screen.

(a) In which direction - towards or away from the lens, does he move the screen to focus the object ?

(b) What happens to the size of the image - Does it increase or decrease ?

(c) What happens when he moves the object very close to the lens ?

(d) What happens to the intensity of the image as the object moves farther and farther away from the convex lens ?

Watch Video Solution

12. A student wants to project the image of a candle flame on a screen 48 cm in front of a

mirror by keeping the flame at a distance of 12 cm from the pole of the mirror.

(a) Suggest the type of mirror he should use.

(b) Find the linear magnification of the image produced.

(c) How far is the image from the object ?

(d) Find the focal length of the mirror.

(e) Draw a ray diagram to show the image formation in this case.

Watch Video Solution

13. The image of an object formed by a mirror is real, inverted and is of magnification - 1. If the image is at the distance of 30 cm from the mirror.

(i) Where is the object placed ?

(ii) Find the position of the image object is now moved 20 cm towards the mirror.

(iii) What is the nature of the image obtained ? Justify your answer with the help of ray diagram.

Watch Video Solution

14. An object placed between the pole and focus of a concave mirror produced a virtual and enlarged image. Explain this using mirror formula.

Watch Video Solution

15. What is meant by power of a lens ? You have three lenses A, B, C of power $+10D$, $+5D$ and $-10D$ respectively. State the nature and focal length of each lens.

Explain which of the three lenses will from a virtual and magnified image of an object placed at 15 cm from the lens. Draw the ray diagram in support of your answer.

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16. Draw ray diagrams showing the image formation by a concave mirror when an object is placed.

(a) between pole and focus of the mirror

(b) between focus and centre of curvature of

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(d) at infinity

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(c) How far is the image from the object ?

(d) Find the focal length of the mirror.

(e) Draw a ray diagram to show the image formation in this case.

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28. The image of an object formed by a mirror is real, inverted and is of magnification - 1. If the image is at the distance of 30 cm from the mirror.

(i) Where is the object placed ?

(ii) Find the position of the image object is now moved 20 cm towards the mirror.

(iii) What is the nature of the image obtained ? Justify your answer with the help of ray diagram.

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29. An object placed between the pole and focus of a concave mirror produced a virtual and enlarged image. Explain this using mirror formula.

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30. What is meant by power of a lens ? You have three lenses A, B, C of power $+10D$, $+5D$ and $-10D$ respectively. State the nature and focal length of each lens. Explain which of the three lenses will from a virtual and magnified image of an object placed at 15 cm from the lens. Draw the ray diagram in support of your answer.

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