PHYSICS

BOOKS - MODERN PUBLICATION

REFLECTION AND REFRACTION

Exercise

1. what is reflection of light ?

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2. Differntiate between real and virtual image.

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3. State the characteristis of image formed by a plane mirror.

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4. Fill ups

Light is an.....wave.

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5. Fill ups

The speed of light is highest in.....and is value is..... .

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6. What is range of wavelength for visisble light?

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7. Fill ups

The line which depicts the directon of propagation of light is called.....and a bundle of such lines is called a..... .

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8. Fill ups

When a light falls on the interface of two media, a part of it may be.....another part is.....and the remaining is..... .

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9. Fill ups

A object which emits its ownlight is called.....object.

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10. Fill ups

An incident ray makes an angle of 37° with

the plane mirror, the angle of reflection is..... .

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11. What kind of image can be obtained on a screen?

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12. Fill ups

.....metal is the best reflector of light.

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13. Fill ups

The radius of curvature of plane mirror is..... .

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14. Fill ups

The speed of light in vacuum is.....

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15. Fill ups

A ray of light is incident on a plane mirror making an angle of 40° with the normal at the point of incidence. The angle of reflection is..... .

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16. Fill ups

The height of an object placed in front of a

plane miror is 5 cm. The height of the virtual image formed is.....

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17. Fill ups

An object is placed 20 cm infront of a plane mirror. The distance between the object and its virtual image is.....

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18. Fill ups

A ray of light is incident on a plane mirror making an angle of 20° with the normal. The mirror is now rotated by 10° such that the normal at the point of incidence moves away from the incident ray. The angle of reflection is..... .

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19. True or false

Light can be travel in vacuum.

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20. True or false

Speed of light is same in all mediums.

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21. True or false

A highly polished surface is a good reflector of light.

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22. True or false

A transparent medium is a good transmitter of light.

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23. True or false

A virtual image is one which is formed by the actual intersection of rays and can be obtained on a screen.

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24. True or false

The image of an extended object is a collection of the image points of the various point sources of the object.

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25. True or false

Light wave is a longitudinal wave.

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26. True or false

Image size=object size for a plane mirror.

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27. True or false

Moon is a luminous object.

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28. True or false

Normal incidence means ange of incidence is zero.

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29. Draw ray diagrams for objects placed at different positions in front of a concave lens?

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30. Draw ray diagrams for objects placed at different positions in front of a convex lens?

Watch Video Solution

31. What are the uses of concave and convex mirrors?

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32. Write the uses of convex mirror?

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33. Fill ups

A lay of light parallel to the principal axis after reflection from a concave mirror passes through..... .

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34. Fill ups

A rays of light paralle to the principal axis after reflection from convec mirror appears to be coming from..... .

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35. Fill ups

The focal length of concave mirror is.....and that of convex mirror is..... .(positive, negative)

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36. Fill ups

A ray of light passing through the focus of a

concave mirror after reflection from the mirror becomes ..... .

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37. Fill ups

A ray of light directed towards the focus of the convex mirror after reflection from the mirror becomes..... .

Watch Video Solution

38. Fill ups

A ray of light through the centre of curvature of a concave mirror after reflection from a concave mirror..... .

Watch Video Solution

39. Fill ups

A ray of light directed towards the centre of curvature of convex mirror after reflection from he mirror..... .

Watch Video Solution

40. Fill ups

It m has a negative value, the image is..... .

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41. What is concave mirror

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42. True or false

The radius of curvature and focal length are related as $R = \frac{F}{2}$.

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43. True or false

If the value of v is positive, then the image is formed behind the mirror and is virtual and errect.

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44. True or false

If the value of v is negative, then the image is formed in front of the mirror and is real and inverted.

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45. True or false

If m>1, size of image is greater than the size of object.

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46. True or false

When a concave mirror is placed in water, its focal length changes.

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47. True or false

Focal length of a concave mirror is positive.

Watch Video Solution

48. True or false

Convex mirror always produces a virtual, erect and diminished image.

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49. What is concave mirror

Watch Video Solution

50. Which mirror always forms virtual, erect and smaller image?

Watch Video Solution

51. True or false

the unit of magnification is meter.

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52. Fill ups

.....metal is the best reflector of light.

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53. State the laws of reflection.

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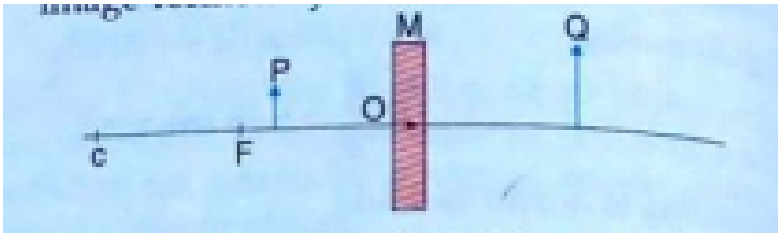
54. True or false

Consider the following diagram in which M is a

mirror and P is an object and Q is the magnified image formed by the mirror.



State the type of mirror M and one characterstic property of the image Q.

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55. What is a ray of light?

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56. What is the law of refraction in terms of angles i and r?

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57. In dispersion of light through a glass prism angle of deviation is minimum for:

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58. The refractive index of diamond is:

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59. What is the speed of light in a transparent medium which has a refractive index of 1.7.

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60. The refractive index of diamond is:

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61. The refractive index of air is greater than one.

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62. Monochromatic light of wavelength 589 nm is incident from air on a water surface. What are the wavelength, frequency and speed of- refracted light. Refractive index of water is 1.33

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63. A ray of light passes from air to glass. The glass of incidence is 45°. Find the angle of refraction, given refractive index of glass is 1.5.

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64. A ray of light moves from air into a glass slab. The refractive index of glass slab is 1.5. What is the speed of light in glass?

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65. Draw ray diagrams for objects placed at different positions in front of a convex lens?

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66. Draw ray diagrams for objects placed at different positions in front of a concave lens?

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67. An object is placed at 0.06 m from a convex lens of focal length 0.10 m.Calculate the position and nature of the image.

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68. Find the power of a concave lens of focal length 3 m.

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69. An object is placed 60 cm from a concave lens. The image is formed at a distance of 20 cm from the optical centre. Find the focal length of the lens? Is the lens converging or diverging?

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70. A convex lens is of focal length 30 cm. Find the distance where the object shoud be placed in front of the lens so that the image is

formed 10 cm form the lens? What is the magnification.

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71. A 10 cm hight object is placed at a distnace of 30 cm from a convex lens of focal length 10 cm. draw a rays diagram and find the position, size an nature of image formed.

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72. A convex lens of focla length 18 cm and a concave lens of focal length 24 cm are placed in contact such that they have a common principal axis. Find the power of their combination. Will the combination behave as a converging or diverging lens.

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73. To find the image distance for varying object distances in case of a convex lens, a

students obtains on a screen a sharp image of bright object placed vary far from the lens. After that he gradually moves the obejct towards the lens and each time focuses its image on the screen.

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74. In which direction-towards or away from the lens, does he move the screen to focus the object?

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75. What happens to the size of image-does it increases or decreases?

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76. What happen when he moves the object very close to the lens?

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77. A convex lens can form a magnified, erect as well as inverted image of an object placed in front of it. Draw ray diagram to justify this statement stating the position of the object with respect to the lens in each case.

An object of height 4 cm is placed at a distance of 20 cm form a concave lens of focal length 10 cm. use lens formula to determne the positions of the image formed.

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78. What is meant by power of a lens? What does its sign indicate? State it SI unit, how is it related to the focal length of a lens?

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79. What is the speded of light in vacuum?

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80. Is air transparent or an opaque medium for light?

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81. What is the phenomenon of bouncing back of light in the same medium known as?

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82. What is the line perpendicular to the reflecting surface at the point of incidence known as?

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83. If the angle between the incident ray and the reflecting surface is 30°, what is the angle of reflection?

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84. If an object mvoes with a speed of 1m/s towards a plane mirror. What is the speed of image?

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85. If the plane mirror is rotated through an angle of 5° keeping the direction of incident ray as it is, what is the angle through which the reflected ray turns?

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86. When the object is beyond C in front of concave mirror, where is the image formed?

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87. An object is placed beyond C in front of a convex mirror, where is the image formed?

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88. Which mirror is used as a rea-view mirror in vehicles.

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89. For what position of the object does the image formed by a concave mirror is virtual, erect and enlarged?

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90. For what type of mirror does the image always appears erect and of the smaller size.

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91. For a given incident ray if the plane mirror is rotated by an angle 20°, what angle does the reflected light gets rotated?

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92. The focal length of a mirror is +20 cm. Is it concave or convex?

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93. When a beam of light appears to move towards a common point, what is the beam of light is called?

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94. What is the unit of refractive index?

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95. What is the basic cause of refraction of light?

Watch Video Solution

96. What is the angle between the incident ray and emergent ray passing through a rectangular glass slab?

Watch Video Solution

97. When light travels in a medium where its velocity is high to a medium where it velocity is low, it bends away or towards the normal?

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98. An object is placed at $2F_1$ in front of a convex lens. Where is the image formed?

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99. What is the sign of focal length of a concave lens?

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100. What is the focal length of a convex lens which has a powre of ID?

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101. Which lens has negative power?

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102. Define optical centre of a lens.

Watch Video Solution

103. Which phenomenon is responsible for twinkling of star?

Watch Video Solution

104. The cause of refraction is change of speed of light in different mediums.

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105. When light travels from optically denser medium to optically rarer medium it bends towards the normal.

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106. More the refractive index, higher is the optical density.

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107. The unit of refractive index is ms^{-1}.

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108. Light travels faster in water as compared to air.

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109. A 2 cm high object is placed at a distance of 2 f from the convex lens. The heioght of the image is -2 cm.

Watch Video Solution

110. A point in lens through which light passes undeviated is called the centre of curvature.

Watch Video Solution

111. Convex lens can from real as well as virtual images.

Watch Video Solution

112. The image formed by a concave lens is always diminished.

Watch Video Solution

113. The lens formula is $\frac{1}{u}+\frac{1}{v}=\frac{1}{f}$

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114. The magnification formula for a lens is $m=-\frac{v}{u}$.

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115. The refractive index of air is greater than one.

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116. What is the SI unit of pressure?

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117. A coin present at the bottom of a beaker fille with water appears to be at a height. This is because of refraction.

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118. Optically denser medium must have greater mass density.

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119. A lens having a power of -3D is a convex lens.

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120. A diverging lens has a negative focal length.

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121. The image formed by a convex lens is virtual when the object is placed between optical centre and focus.

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122. An object is placed between F and 2F of a convex lens. The image formed is real, inverted and diminished.

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123. One dioptre is the power of a lens of focal length 10 cm.

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124. The power of a convex lens of focal length 5 cm is greater than the power of convex lens of focal length 10 cm.

Watch Video Solution

125. The image formed by a concave lens is always virtual.

Watch Video Solution

126. Fill ups

It m has a negative value, the image is..... .

Watch Video Solution

127. Fill ups

The magnification of a plane mirror is..... .

Watch Video Solution

128. Fill ups

The mirror which always forms a virtual image is.....

Watch Video Solution

129. Fill ups

The mirror which has wider field of view is.....

Watch Video Solution

130. Fill ups

To obtain an enlarged and virtual image of an object, ...mirror should be used.

Watch Video Solution

131. Fill ups

If the magnification of a body of size 10 cm is 3, the size of the image is.....

Watch Video Solution

132. Fill ups

convex mirror is a .....mirror, whereas a concave mirror is a .....mirror.

Watch Video Solution

133. Fill ups

As you move an object from infity to pole of a convex mirror, the image moves from .....to .....and its size.

Watch Video Solution

134. Fill ups

A concave mirror forms an image of a distant object on a screen. The distance between the screen and the mirror is..... .

Watch Video Solution

135. Fill ups

The image by a concave mirrors of same size when object is placed at.....

Watch Video Solution

136. Fill ups

For a concave lens v is..... .

Watch Video Solution

137. Fill ups

If the speed of light in medium 1 is more than in medium 2, then medium 1 is called optically.....and medium 2 is called optically..... .

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138. Fill ups

A ray of olight falls at the right angles on an interface of two transparent mediums. The angle of refraction is..... .

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139. Fill ups

The ratio of velocities of light rays of wavelength $5000\overset{\circ}{A}$ and $7000\overset{\circ}{A}$ in air is.....

.

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140. Fill ups

Larger the refractive index of a medium.....is the optically density.

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141. Fill ups

The refractive index of diamond is..... .

Watch Video Solution

142. Fill ups

A ray is incident on a rectangular glass slab. The angle between the incident ray and emergent ray is.....

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143. Fill ups

The power focal length of a converging lens is.....and a diverging lens is.....

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144. Fill ups

The S.I unit of power is..... .

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145. Fill ups

A lens forms a virtual and enlarged image of an object. The lens is.....lens.

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146. Fill ups

If the image formed by a lens is always diminished and erect, the name of the lens is.....lens.

Watch Video Solution

147. Fill ups

When the image formed by a convex lens of same size as that the object, the distance of the object form the potical centre is..... .

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148. Fill ups

For a convex lens to act as a magnifying glass, the object should be placed..... .

Watch Video Solution

149. Fill ups

The power lens of a lens-4.0 d. The nature of the lens is..... .

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150. Fill ups

The refractive index of vacumm is..... .

Watch Video Solution

151. Fill ups

The refractive indices of glass and water are 1.50 and 1.35 respectively. When air enters from atmosphere into these mediums at the

same angle of incidence. The angle of refraction is greater in..... .

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152. Fill ups

$n_{21} \times n_{12}$=.....

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153. Fill ups

Light from a point source placed in water is

coming out in atmosphere. It will..... .

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154. Fill ups

If the magnification of a body of size 2 cm is +3 for a convex lens then the size of image is..... .

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155. Fill ups

A concave lens made up of glass is placed in air. The focal length of this lens is..... .

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156. Fill ups

when the object is placed at infinity in front of a convex lens, the image is formed at..... .

Watch Video Solution

157. Fill ups

The power of a lens is inversely proportional to its..... .

Watch Video Solution

158. Fill ups

A ray of light passes from optically rarer medium to optically denser medium at the same angle of incidence. The angle of refraction for optically denser meduim P, Q

and R are $30^{\circ}, 20^{\circ}, 15^{\circ}$. The speed of light will be minimum in..... .

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159. for optically denser meduim P, Q and R are $30^{\circ}, 20^{\circ}, 15^{\circ}$. The speed of light will be minimum in..... .Convex lens forms an erect and enlarged when object is placed between.....and ..... .

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160. The image of a distant object is obtained on a screen by using a concave mirror. The focal length of the mirror is measure by the distance between.

A. the object and the mirror

B. the object and the screen

C. the mirror and the screen

D. the mirror and the screen as well as that between the object and the screen

Answer:

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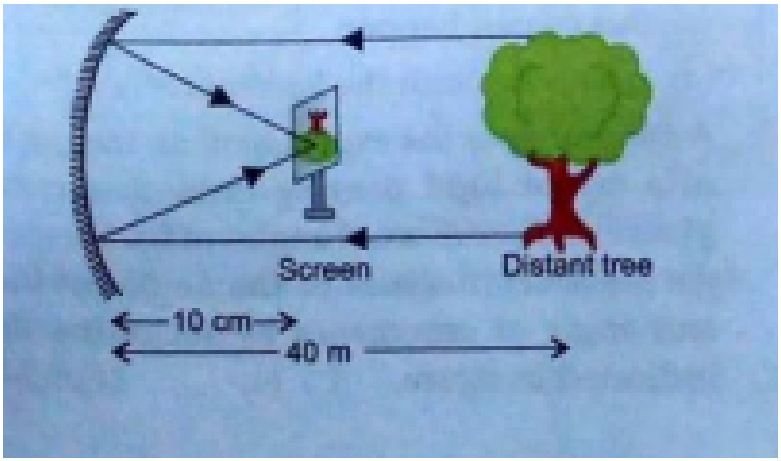
161. The focal length of the concave mirror in the experimental set up shown below is:



A. 10 cm

B. 40 cm

C. 39.9 cm

D. $\propto$

Answer:

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162. If a laser beam is allowed to fall along the principal axis of a concave mirror, the ray will:

A. Emerge out of principal axis

B. Retrace its path along principal axis

C. Deviate by 10°

D. Deviate by 45°

Answer:

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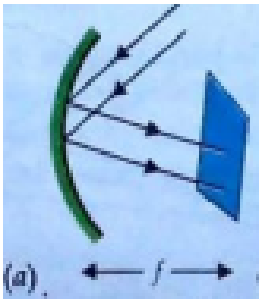
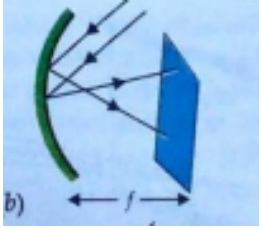
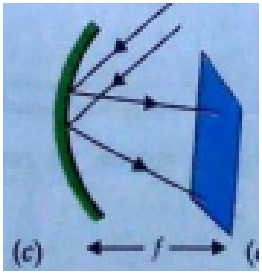
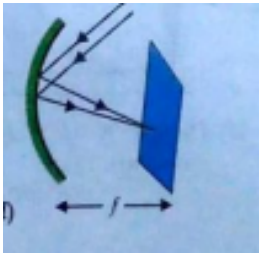
163. The correct ray diagram is

A. 

B. 

C. 

D. 

Answer:

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164. If R is the radius of curvature of a mirror and f is its focal length then

A. fgtR

B. fgt2R

C. f=R

D. $f = \frac{R}{2}$

Answer:

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165. The image formed by a concave mirror is

A. always virtual

B. always real

C. real or virtual

D. always erect

Answer:

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166. A paralle beam of light after reflection from a mirror converges to a point, the mirror is

A. concave

B. convex

C. plane

D. none

Answer:

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167. A concave mirror of focal length 10 cm is dipped in water. The focal length of the concave mirror in water is:

A. gt10 cm

B. lt10 cm

C. 10 cm

D. cannot predicts

Answer:

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168. What is the focal plane of a concave mirror?

A. a plane perpendicular to principal axis at focal point

B. a plane along the principal axis

C. a plane at an angle to principal axis

D. none

Answer:

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169. To find the focl length of a concave mirror, the four students, Ram, Shamim, Kamla and Ruksana obtained the image of the window grill on a wall. They measured the distances as given below between:Ram- window grill and the wall only

Shamim- window grill and the mirror only

Kamla-mirro and wall only

Ruksana-window grill and the wall and also between the mirror and the wall

correct focal length will be obtained by the student

A. Ram

B. Shamim

C. Kamla

D. Ruksana

Answer:

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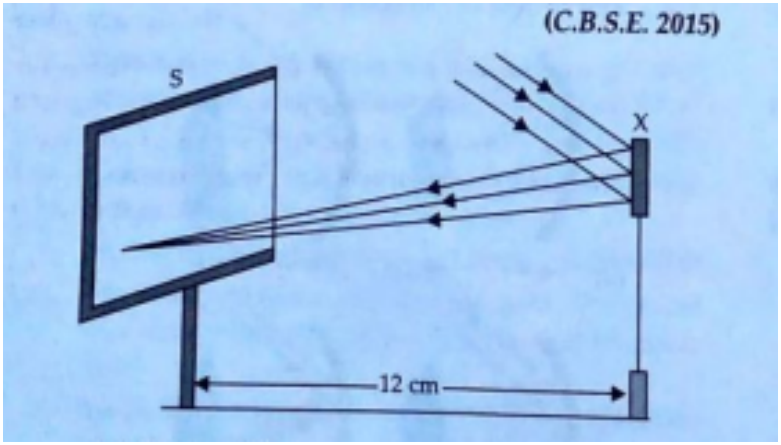
170. Study the following diagram and select the correct statement about the device 'X'?



A. Device 'X' is a concave mirror of radius of curvature 12 cm.

B. Device 'X' is a concave mirror of focal length 6 cm.

C. Device 'X' is a concave mirror of focal length 12 cm.

D. Device 'X' is a convex mirror of focal length 12 cm

Answer:

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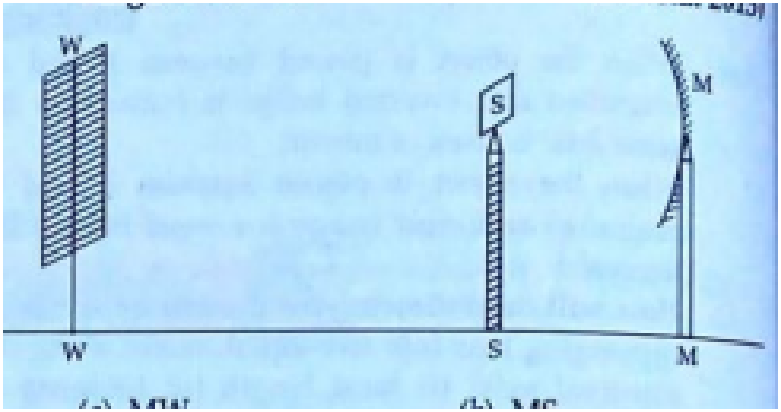
171. A student obtains a sharp image of the distant window of the school laboratory on the screen using the given concave mirror to

determine its focal length. Which of the following distances should be measured to get the focal length of mirror?



A. MW

B. MS

C. SW

D. MW-MS

Answer:

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172. A student obtained sharp image of the grill of a window on a scrren u sing a convex lens. For better results, the teacher suggested focussing of a distant free instead of the grill, in what direction should be the lens be moved for this purpose?

A. Away from the screen

B. Very far away from the screen

C. Behind the scrren

D. Towards the screen

Answer:

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173. A convex lens is distinguished form a concave lens by the property of

A. divergence

B. convergence

C. linear propogation

D. looming

Answer:

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174. A ray of light falls on a plane mirror at an angle θ after refraction, the angle of deviation is

A. 2θ

B. $180 - 2\theta$

C. θ

D. $180 - \theta$

Answer:

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175. If a ray of light passes along the principl axis of a convex lens, it

A. retraces its path

B. deviates by 30°

C. this cannot happened

D. passes through the lens undeviated

Answer:

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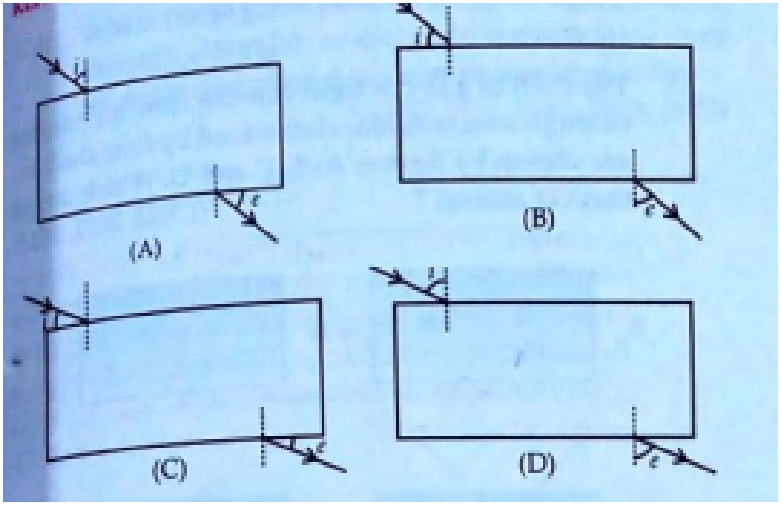
176. A student does the experiment on tracing the path of a ray of light passing through a rectangular glas sslab for different angles of

incidence. He can get a correct measure of the angles of incidence and angle of emergence by following the label indicated in figure.



A. (A)

B. (B)

C. (C)

D. (D)

Answer:

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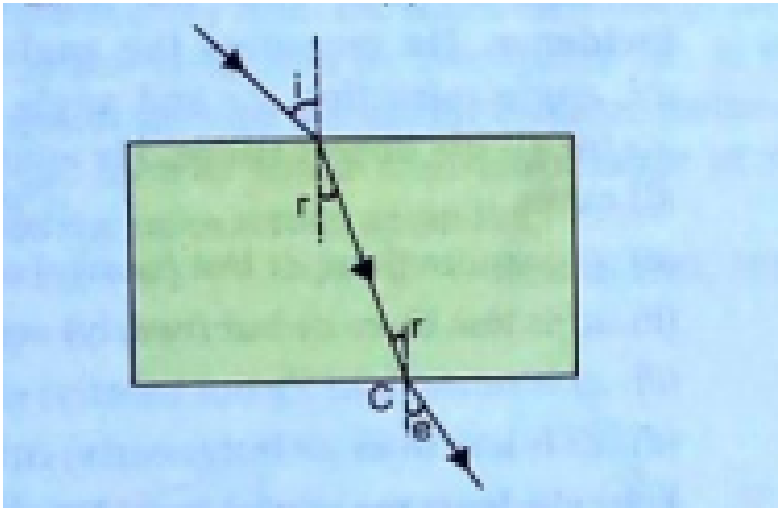
177. While performing the experiment on tracing the path of a ray of light pasing thourgh a glass slab as shown in the figure, four students interpreted the results as given,

choose the correct option



A. $anl \geq r > \angle e$

B. $\angle r = \angle e$

C. $\angle i = \angle r$

D. $\angle i = \angle e$

Answer:

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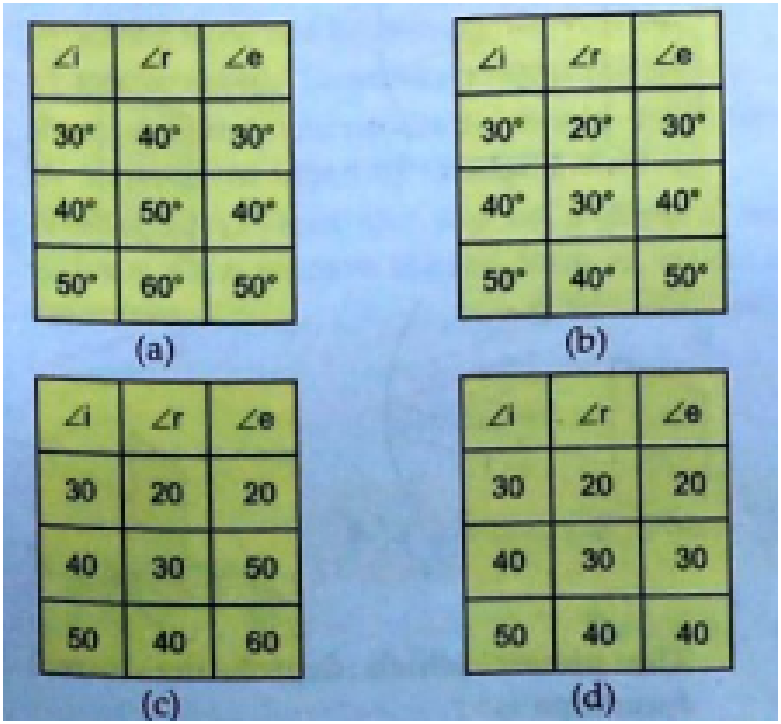
178. Four students reported the following observatio tables for the experiment to trace the path of a ray of light pasing through a glass slab for different angle of incidence. The observation liekly to be correct are those of

student.



$\angle i$	$\angle r$	$\angle e$
30°	40°	30°
40°	50°	40°
50°	60°	50°

(a)

$\angle i$	$\angle r$	$\angle e$
30°	20°	30°
40°	30°	40°
50°	40°	50°

(b)

$\angle i$	$\angle r$	$\angle e$
30	20	20
40	30	50
50	40	60

(c)

$\angle i$	$\angle r$	$\angle e$
30	20	20
40	30	30
50	40	40

(d)

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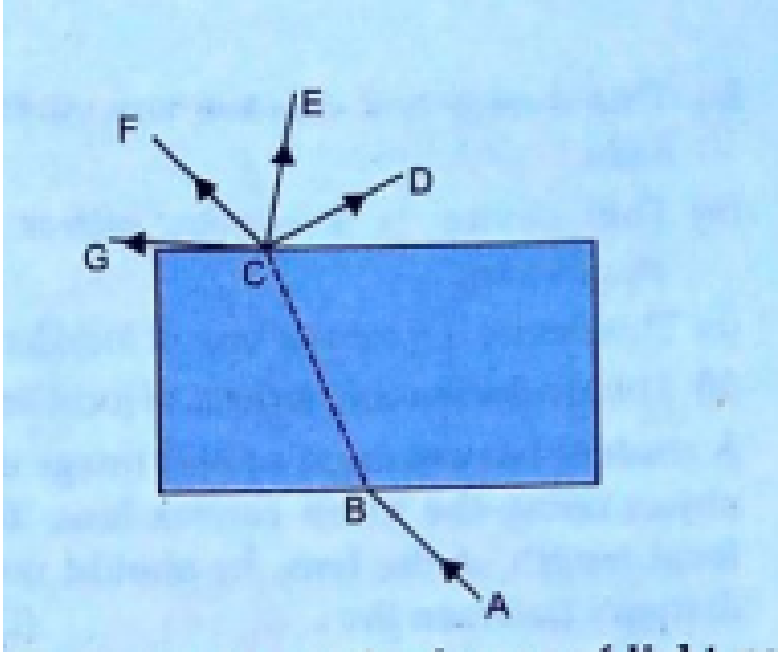
179. AB is the incident ray on a glass slab. The emergent ray is



A. CD

B. CE

C. CF

D. CG

Answer:

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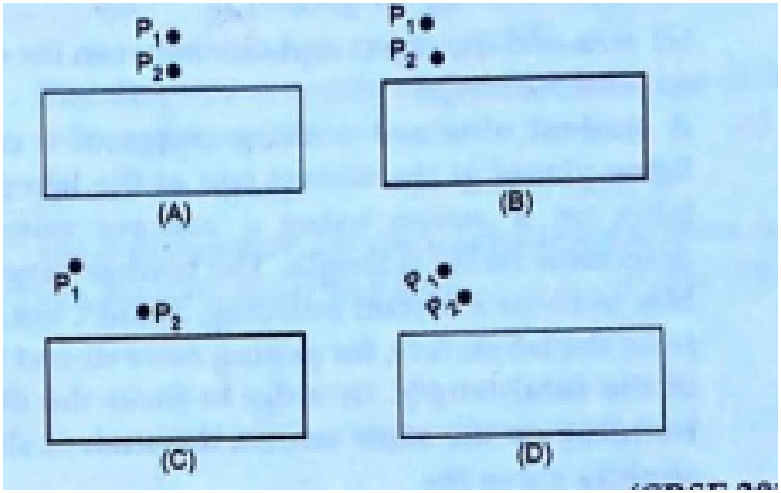
180. While tracing the path of a ray of light passing from air through a rectangular glass slab, the setup, in which the best result will be obtained is



A. A

B. B

C. C

D. D

Answer:

Watch Video Solution

181. Which of the following set of materials represents the minimum material requried for determing the focal length of a convex lens by obtianing the image of a distannt object on a

screen in your school laboratory.

Set A- A candel, a match box, a convex lens, a lens holder, a screen with stand

Set B- A lens holder a convex lens, a concave lens, a measuring scale.

Set C- A convex lens holder, a scrren with a stand, a measuring scale.

Set D- A convex lens, a burning candle, a screen with stand, a lens holder

A. Set A

B. Set B

C. Set c

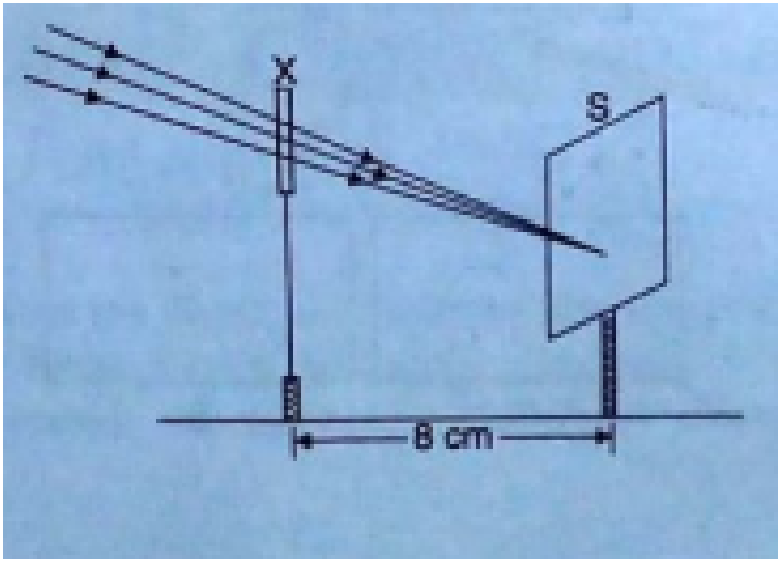
D. Set D

Answer:

Watch Video Solution

182. A student used a device to obtain/focus the image of a well illuminate distant building on a scrren as shown below in diagram. Select

the correct statement above the device



A. This device is a concave lens of focla length 8 cm

B. This device is a onvex mirror of focla length 8 cm

C. This device is a convex lens of focal length 4 cm

D. This device is a convex lens of focal length 8 cm.

Answer:

Watch Video Solution

183. A student has obtained a point image of a distant object using the given convex lens. To

find the focal length of the lens, the should measure the distance between the

A. lens and the object only

B. lens and screen only

C. object and image only

D. lens and the object and also between the object and the image.

Answer:

Watch Video Solution

184. A student obtained a sharp image of a candle flame placed at the distant end of the laboratory table on a screen using a concave mirror to determine the focal lengh. The teacher suggested him to focus a distant builiding, about 1km away form the laboratory, for getting more correct value of the focal length. in order to focus the distant building on the same screen, the student should slightly move the

A. mirror away from the screen

B. screen away from the mirror

C. screen towards the miror

D. screen towards the building

Answer:

Watch Video Solution

185. To determine the approximate focal length of the given convex lens by focussing a distant objects you try to focus the image of

the object on a scree. The image you obtain an the screen is always.

A. errect and laterally inverted

B. erect and diminished

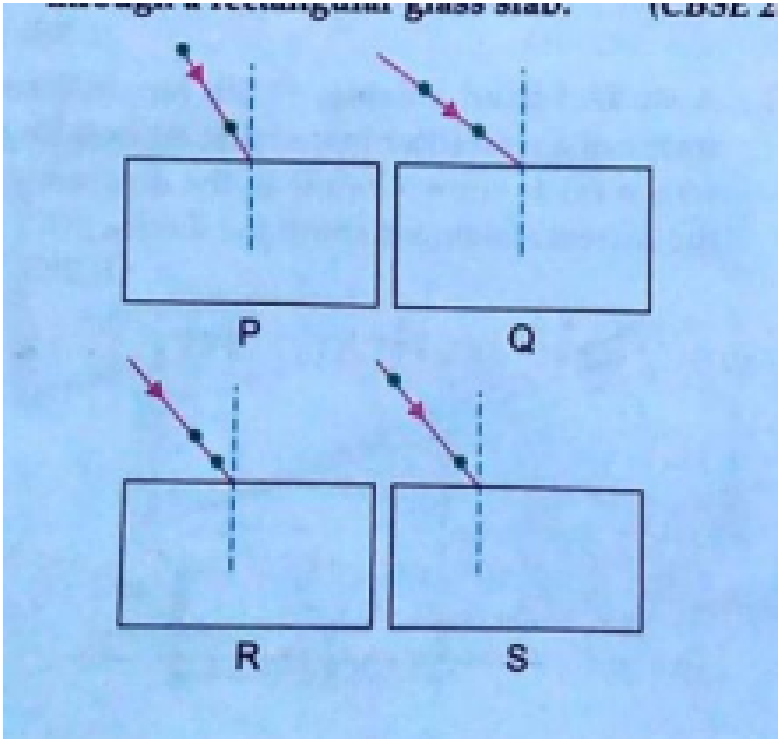
C. inverted and diminished

D. virtual, inverted and diminished

Answer:

Watch Video Solution

186. Select from the following the best expeirmental setup for tracing the path of ray of light passing through a rectangular glass slab.



A. P

B. Q

C. R

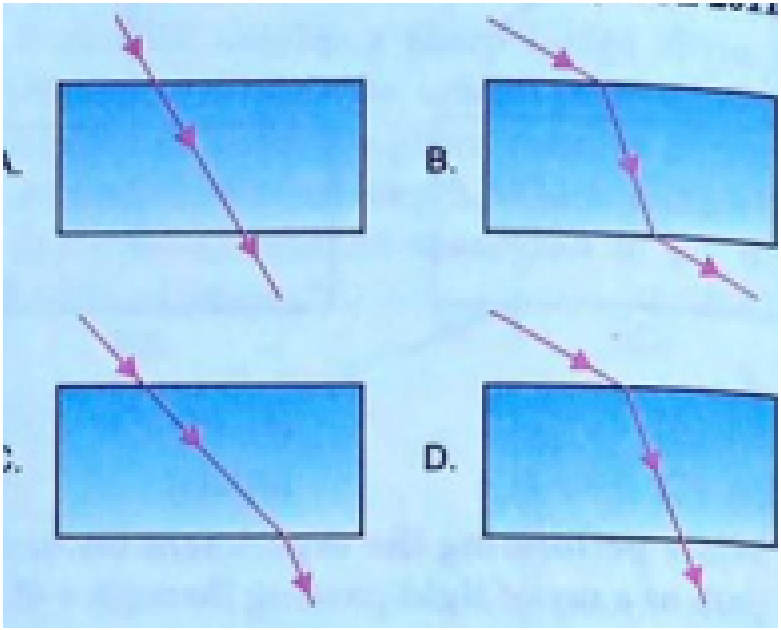
D. S

Answer:

Watch Video Solution

187. The path of a ray of light coming from air pasisng through the rectangular slab traced by four students are shown by figures A,B and

C and D. which one of them is correct?



A. A

B. B

C. C

D. D

Answer:

Watch Video Solution

188. A student performs the experiment on tracing the path of ray of light passing through a rectangular glass slab for different angles of incidence. He measures the angle of incidence $anl \geq i$, angle refraction $\angle r$ and angle of emergence $\angle e$ for all his observation. he would find that in all cases.

A. $\angle i$ is more than $\angle r$ but equal to $\angle e$

B. $an \geq i$ is less than $\angle r$ but (nearly) equal to $\angle e$

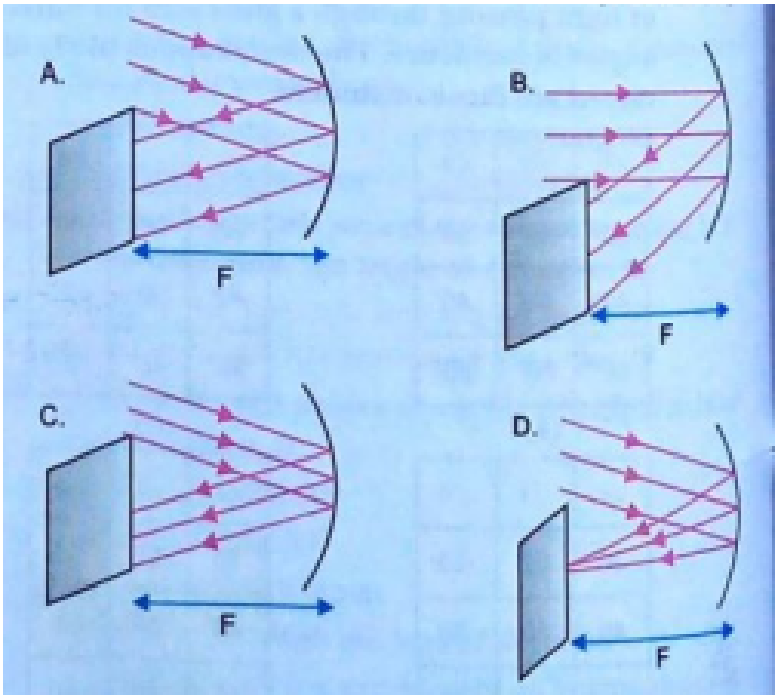
C. $\angle r$ is more than $\angle e$ but equal to $\angle r$.

D. $\angle i$ is less than $\angle e$ but equal to $\angle r$.

Answer:

Watch Video Solution

189. Four students measured focal length of a concave mirror while performing an experimental as shown.



A. A

B. B

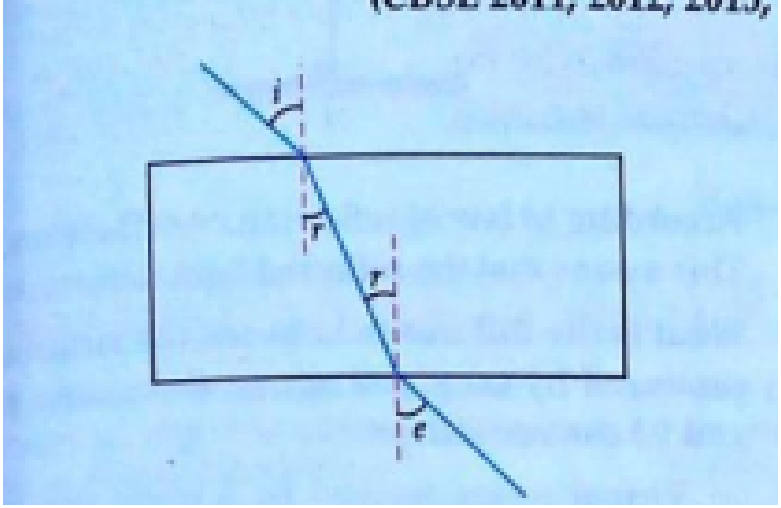
C. C

D. D

Answer:

Watch Video Solution

190. While tracing the path of a ray of light pasing through glass slab as shown in the diagrams, four students interpreted the results as given below:



The student who has made the correct interpretation is

$\angle r > \angle e = \angle i$

`angle r=angle e$\angle i = \angle r > \angle e$

$\angle i = \angle e > \angle r$

A. A

B. B

C. C

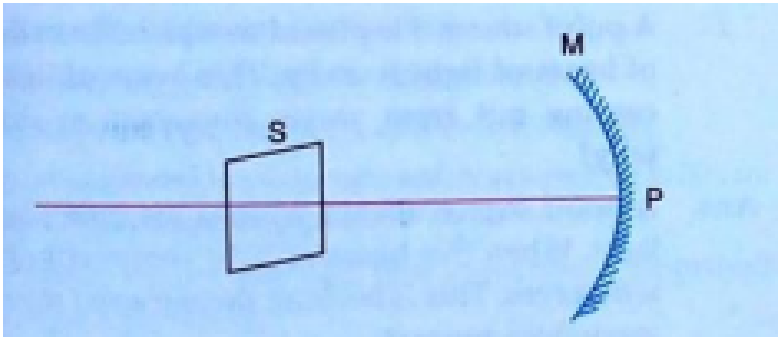
D. D

Answer:

Watch Video Solution

191. In the adjoining figure 'S' is the position of the scrren on which a sharp image of a distant object is formed by the mirror 'M'. If the object moves towards the mirror by some distance, say 50 cm, then to obtain the sharp image of

the object on the same screen again the



A. screen should be moved towards the object

B. screen need not be moved

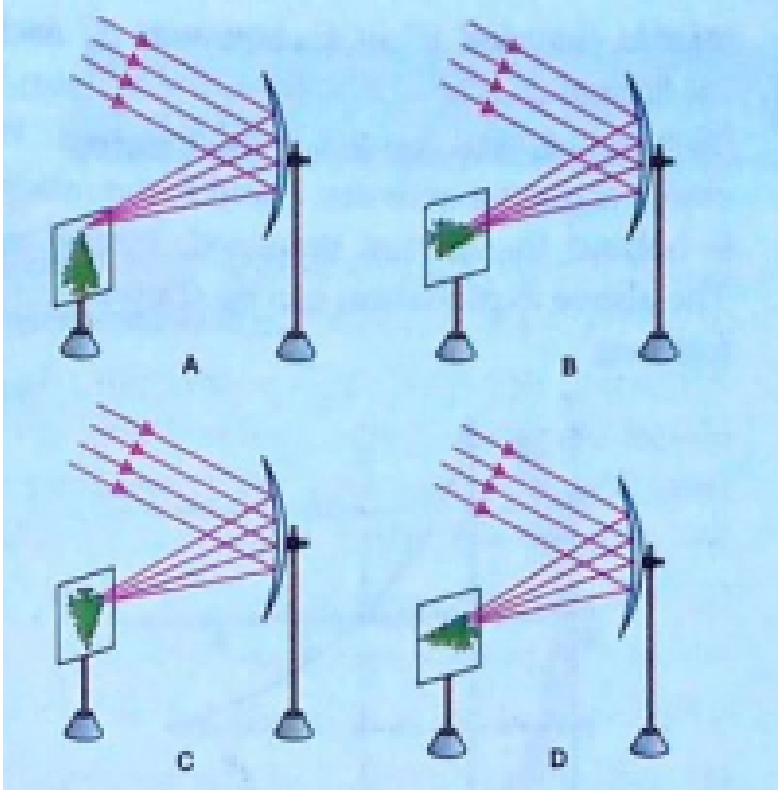
C. mirror should be moved toward the screen

D. screen and mirror both should be moved towards the object by same distance

Answer:

Watch Video Solution

192. Parallel rays, form the top of a distant tree incident on a concave mirror, form an image on the screen.



The diagram correctly showing the image of the tree on the screen is

A. A

B. B

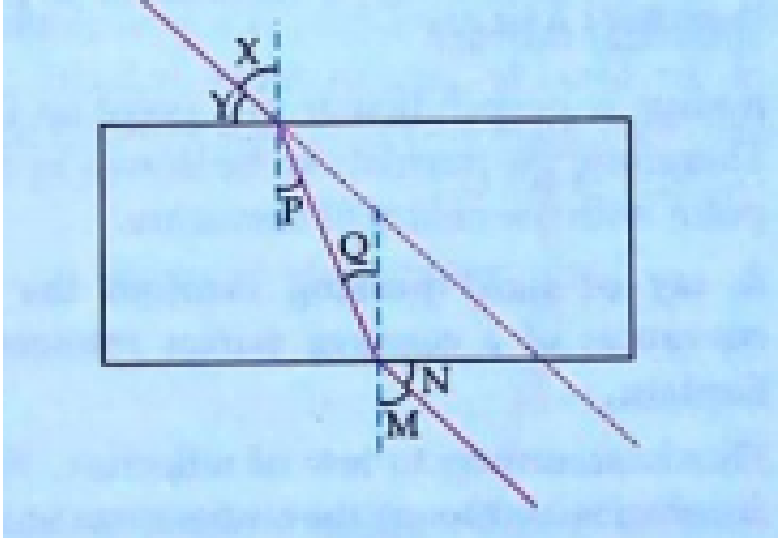
C. C

D. D

Answer:

Watch Video Solution

193. For the refraction through the rectangular glass slab the diagram is given below:



The anlge of incidence, angle of a emergence and angle of refraction are respectively.

A. X,P,M

B. X,M,P

C. Y,M,P

D. Y,N,P

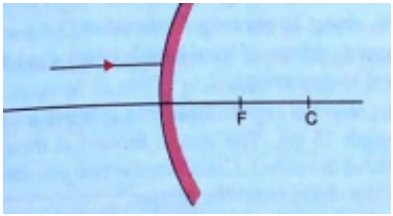
Answer:

Watch Video Solution

194. Where will the image be formed by a concave mirror when an object is placed between the pole and the focus point of the mirror?

Watch Video Solution

195. A rays of light is incident on a convex mirrors as shown below:



Redraw the diagram after completing the path of the light ray after reflection from the mirror.

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196. For what position of an object, a concave mrror forms

an enlarged and virtual image?

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197. For what position of an object, a concave mrror forms

a real image of equal size to the object?

Watch Video Solution

198. Define principal focus of a mirror.

Watch Video Solution

199. The radius of curvature of a spherical mirror is 30 cm. what is the focal length?

Watch Video Solution

200. Name a mirror that can give an erect and diminished image of an object.

Watch Video Solution

201. Find the focal length of a convex mirror whose radius of curavute is 32 cm.

Watch Video Solution

202. The image formed by a concave mirror is observed to be real, inverted and of same size as that of object. Then the position of the object should be

between the focus and centre of curvatures?

Watch Video Solution

203. The image formed by a concave mirror is observed to be real, inverted and of same size as that of object. Then the position of the object should be

at the centre of curvature.

Watch Video Solution

204. The image formed by a concave mirror is observed to be real, inverted and of same size as that of object. Then the position of the

object should be

beyond the centre of curvature.

Watch Video Solution

205. The image formed by a concave mirror is observed to be real, inverted and of same size as that of object. Then the position of the object should be

between the pole of the mirror and its focus.

Watch Video Solution

206. No matter how far you stand from a spherical mirror, yours image appears erect. The mirror may be

plane

concave

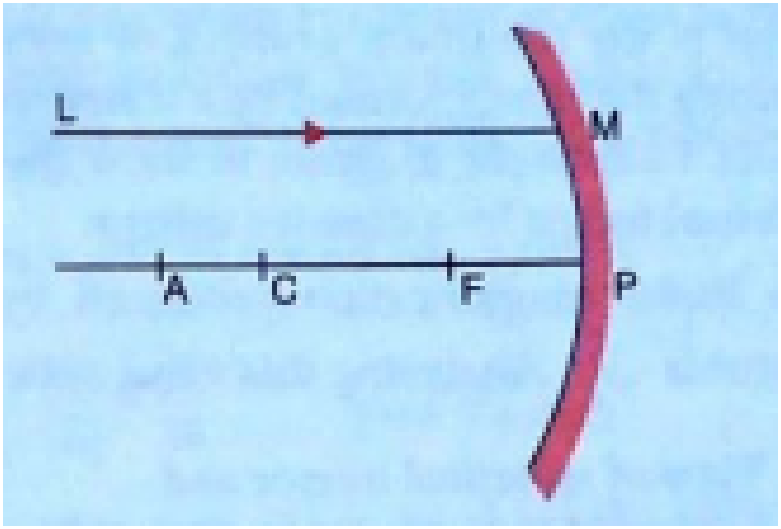
convex

either plane or convex.

Watch Video Solution

207. A ray of light LM is incident on a mirror as shown in figure. The angle of incidence for this

ray is the angle between it and the line joining two other points in the figure. Name these two points.



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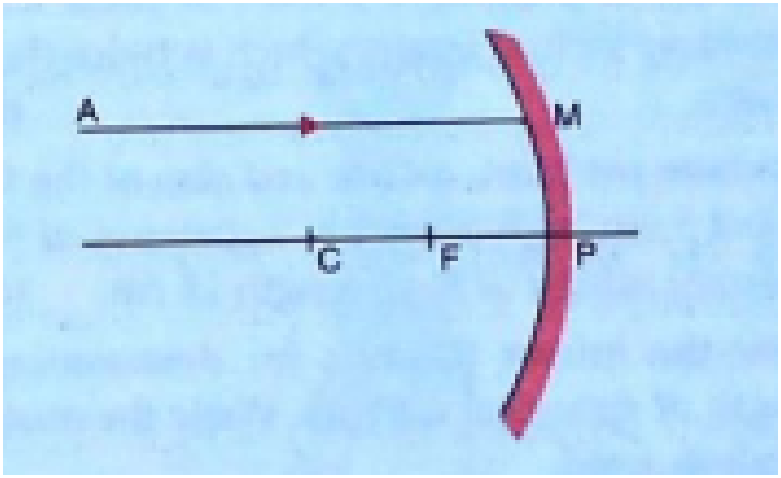
208. A ray of light AM is incident on a spherical mirror as shown in the diagram. Redrew the

diagram on the answer sheet and show the path of reflected ray. Also incident and mark the angle of reflection in the diagram.



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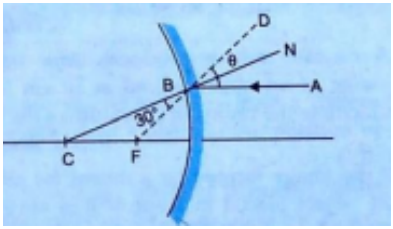
209. In a mirror, object distance=Image distance. Name the mirror.

Watch Video Solution

210. From the ray diagram find θ



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211. Explain with the help of a ray diagram how a concave mirror converges a parallel beam of light.

Watch Video Solution

212. Explain with the help of a ray diagram how a convex mirror diverges a parallel beam of light.

Watch Video Solution

213. What is the magnification of the images formed by plane mirrors and why?

Watch Video Solution

214. State the characteristis of image formed by a plane mirror.

Watch Video Solution

215. An object 5.0 cm of 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.

Watch Video Solution

216. Draw a ray diagram to show the position of image formed when an object is placed between focus F and pole P of concave mirror.

Watch Video Solution

217. Draw a ray diagram to show the nature of image formed when an object is placed between focus F and pole P of concave mirror.

Watch Video Solution

218. An object is placed at a distance of 12 cm in front of a concave mirror. It forms of a real image four times larger than the object. Calculate the distance of the image of the mirror.

Watch Video Solution

219. What is the minimum number of rays required for locating the image formed by a

concave mirror for an object. Draw a ray diagram to show the formation of a virtual image by a concave mirror?

Watch Video Solution

220. Find the position of an object,which when placed in front of a concave mirror of focal length 20 cm,produces a virtual image,which is twice the size of the object.

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221. Find the position nature and size of the image of an object 3 cm high placed at a distance of 9 cm form a concave mirror of focal length 18 cm.

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222. A concave mirror produces three times enlarged image of an object placed at 10 cm in front of it. Calculate the radius of curvature of the mirror.

Watch Video Solution

223. If the image formed by a mirror for all positions of the object placed n front of it is always erect and diminished, what type of mirror is it draw a ray diagram to justify your answer. Where and why do we generally use this type of mirror?

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224. Draw a ray diagram to show the image formation by a concave mirror, when the object is kept between its focus and the pole.

Watch Video Solution

225. Draw ray diagram to show the formation of images when the object in front of concave mirror is

between the centre of curvature and focus point.

Watch Video Solution

226. Draw ray diagrams to show the formation of images when the object in front of a convex mirror is placed at inifinity?

Watch Video Solution

227. Draw ray diagrams to show the formation of images when the object in front of a convex

mirror is

at any other position near the mirror.

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228. Find the location of the object which when placed in front of a convex mirror produces an image half the size of the object. Given the focal length of convex mirror is 20 cm.

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229. An object 4 cm high is placed at a distance of 6 cm in front of a concave mirror of focal length 12 cm. find the position nature and size of the image formed.

Watch Video Solution

230. The radius of curvature of a convex mirror used on an automobile is 200 cm. A bus is coming behind it at at distance of 3.5 m. calculate

the position. Also comment on the nature of image.

Watch Video Solution

231. The radius of curvature of a convex mirror used on an automobile is 200 cm. A bus is coming behind it at at distance of 3.5 m. calculate

the size of images relative to the bus. Also comment on the nature of image.

Watch Video Solution

232. An object 10 cm long is placed at 15 cm away from a convex mirror of focal length 10 cm. find the position and size of image.

Watch Video Solution

233. An object is kept in front of a concave mirror of focal length 15 cm. the image formed is three times the size of the object. Calculate the two possible distances of the objects from the image.

Watch Video Solution

234. A small candle, 2.5 cm in size is placed at 27 cm in front of a concave mirror of radius of curvature 36 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image? Describe the nature and size of the image. If the candle is moved closer to the mirror, how would the screen have to be moved?

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235. How far should an object be from a concave mirror of radius 0.36 m to from a real image $\frac{1}{9}th$ of its size?

Watch Video Solution

236. A needle 1 cm hight is placed at a distance of 0.1 m from a convex mirror of focal length 0.05 m. Determine the position and size of the image.

Watch Video Solution

237. Find the focal length of a convex sphericla mirror which is produces an image $\frac{1}{6}th$ the size of an object located 0.12 m from the mirror?

Watch Video Solution

238. The image formed by a convex mirror of focal length 0.3 m is a quarter of the object. What is the distance of the object from the mirror?

Watch Video Solution

239. The radius of curvature of a concave mirror is 30 cm what is its focal length?

Watch Video Solution

240. The focal length of a convex mirror is 10 cm. what is the radius of curvature?

Watch Video Solution

241. A convex mirror used as a rear view mirror in a car has 4 m radius of curvature. If a truck is located at 6 m from this mirror, find the position, nature and size of the image.

Watch Video Solution

242. An object 6 cm in size is paced 20 cm in front of a spherical mirror. If the image is formed at 4 cm to the rear of the mirror, calculate its focl length. Is the mirror convex or concave? What is nature of image?

the positive sign of the focal length shows that the mirror is convex, since the image is formed behind the mirror, it is virtual and erect.

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243. If the magnification of a body of size 1 m is 2, what is the size of the image?

Watch Video Solution

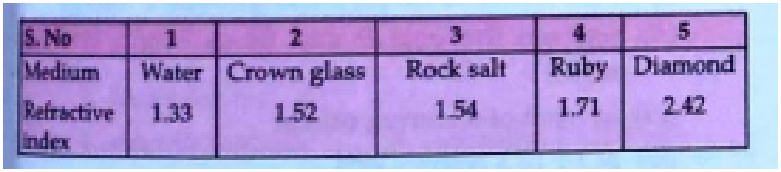
244. What is the power of a concave lens of focal length 25 cm?

Watch Video Solution

245. What will be the focal length of a lens whose power is given as +2.0 D?

Watch Video Solution

246. The following table gives the values of refractive indices of a few media

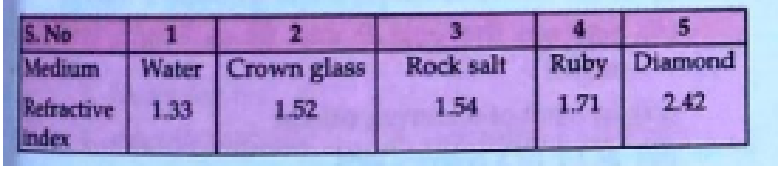


S. No	1	2	3	4	5
Medium	Water	Crown glass	Rock salt	Ruby	Diamond
Refractive index	1.33	1.52	1.54	1.71	2.42

a medium pair so that light speeds up when it goes from one of these media to another.

Watch Video Solution

247. The following table gives the values of refractive indices of a few media



S. No	1	2	3	4	5
Medium	Water	Crown glass	Rock salt	Ruby	Diamond
Refractive index	1.33	1.52	1.54	1.71	2.42

a medium pair so that light slows down when it goes from one of these media to another.

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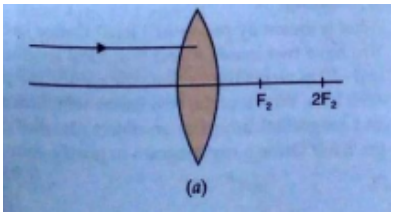
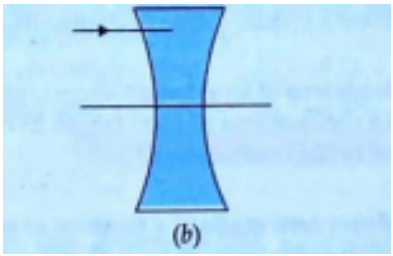
248. Why does the ray of light bend when it travels from one medium to another?

Watch Video Solution

249. Draw the given diagram in your answer book and complete it for the path of ray of light beyond the lens.





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250. Refractive index of two material mediums X and Y are 1.3 and 1.5 respectively. In which of the two, the light would travel faster?

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251. What is meant by power of a lens? What does its sign indicate? State it SI unit, how is it related to the focal length of a lens?

Watch Video Solution

252. An object is placed at 0.06 m from a convex lens of focal length 0.10 m.Calculate the position and nature of the image.

Watch Video Solution

253. Light enters from air to diamond having refractive index 2.4. what is the speed of light in diamond ? Given speed of light in vacuum $= 3 \times 10^8$ m s^{-1}.

Watch Video Solution

254. With respect to air, the refractive index of ice is 1.31 and that of rock salt is 1.54. Calculate the refractive index of rock salt w.r.t. ice?

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255. Give the nature, position and size of the image formed by a convex lens when the object lies at 2 F

Watch Video Solution

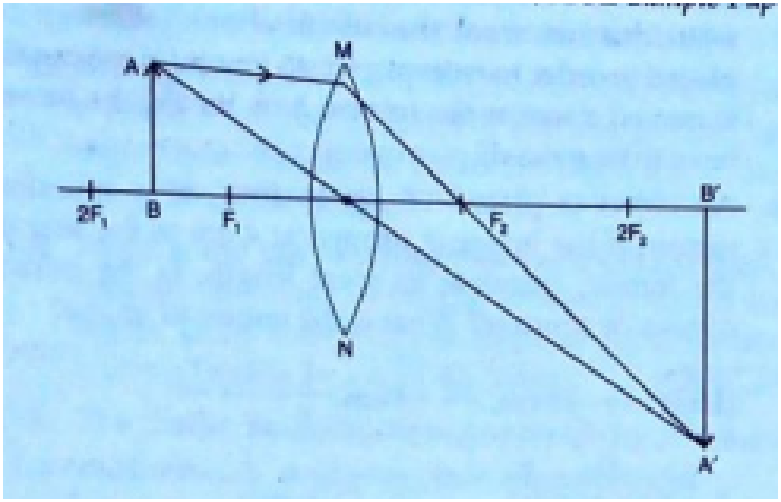
256. Where will the image be formed by a concave mirror when an object is placed between the pole and the focus point of the mirror?

Watch Video Solution

257. Expain with the help of a diagram why a pencil partly immersed in water appears to be bent at the water sufrace?

Watch Video Solution

258. Study the ray diagram give below and answer the following questions:



State the type of lens used in the figure.

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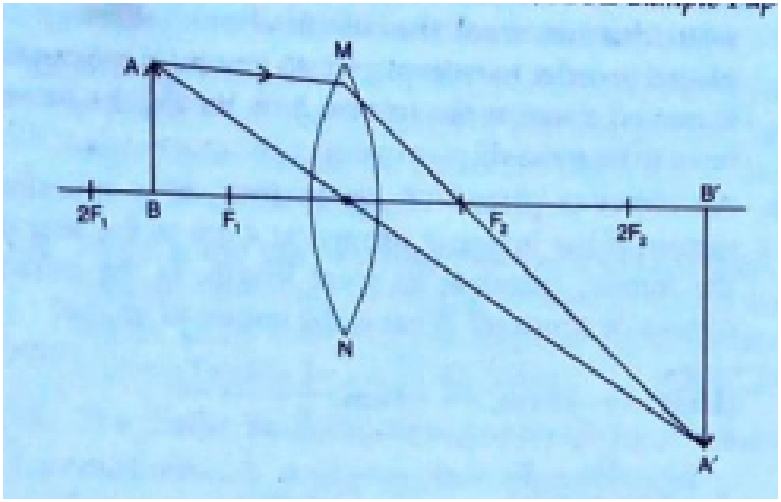
259. Study the ray diagram give below and answer the following questions:



List two properties of the image formed.

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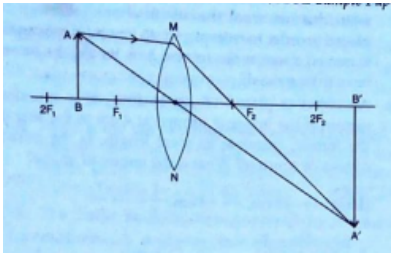
260. Study the ray diagram give below and answer the following questions:



In which position of the object wioll the magnification be -1?

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261. Calculate the distance at which an object should be placed in front of a convex lens of

ocal length 10 cm,so as to obtain an image twice the size of the object?

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262. A doctor advises a patient to use spectacles with a convx lens of focal length 40 cm in contact with a concave lens of focal elnggth 25 cm.Wjhat is the power of the resultant combination?

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263. A convex lens made of material of refractive index n_1 is kept in a medium of refractive index n_1. Parallel rays of light are incident on the lens. Complete the path of light emerging from the convex lens, if $n_1 > n_2$

Watch Video Solution

264. A convex lens made of material of refractive index n_1 is kept in a medium of refractive index n_1. Parallel rays of light are

incident on the lens. Complete the path of light emerging from the convex lens, if $n_1 = n_2$

Watch Video Solution

265. A convex lens made of material of refractive index n_1 is kept in a medium of refractive index n_2. Parallel rays of light are incident on the lens. Complete the path of light emerging from the convex lens, if $n_1 < n_2$

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266. Find the position nature and size of the image of an formed by a convex lens of focal length 20 cm of an object 4 cm high placed at a distance of 30 cm from it.

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267. A convex lens has focal length of 30 cm. calculate the what distance should the object be placed from the lens so that it forms an

image at 60 cm on the other side of the lens? Find the magnification produced by the lens in this case?

Watch Video Solution

268. A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. the distance of the object from the lens is 30 cm. By calculation determine its position?

Watch Video Solution

269. A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. the distance of the object from the lens is 30 cm. By calculation determine the size of the image formed?

Watch Video Solution

270. An object 50 cm tall is placed on the principal axis of a convex lens. It 20 cm tall image is formed on the screen placed at a

distance of 10 cm from the lens. Calculate the focal length of the lens.

Watch Video Solution

271. A concave lens has focal length of 20 cm. at what distance from the lens a 5 cm tall object be placed so that if forms an image 15 cm from the lens? Also calculate the size of the image formed.

Watch Video Solution

272. Draw a ray diagrams to show the use of convex lens for the formatiion of images having the following characterstics:

Real, inverted and diminished.

Watch Video Solution

273. Draw a ray diagrams to show the use of convex lens for the formatiion of images having the following characterstics:

Virtual, erect and magnified.

Watch Video Solution

274. Two lenses have power of

2D and -4D. What is the nature and focal length of each lens?

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275. Two lenses have power of

-4D. What is the nature and focal length of each lens?

Watch Video Solution

276. Two lenses have power of 2D and -4D. An object is kept at a distance of 100 cm from each of the above lenses. Calculate

image distance?

Watch Video Solution

277. Two lenses have power of 2D and -4D. An object is kept at a distance of 100 cm from each of the above lenses. Calculate

magnification in each of the two cases.

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278. With the help of a ray diagram, show that when light falls obliquely on a side of a rectangular glass slab, emergent ray is parallel to the incident ray?

Watch Video Solution

279. Show the lateral displacement on the ray diagram.

Watch Video Solution

280. For what position of the objects does a convex lens forms a virtual and erect image? Explain with the help of ray diagram.

Watch Video Solution

281. A concave lens of focal length 15cm forms an image 10 cm from the lens. How far is the object placed from the lens? Draw ray diagram.

Watch Video Solution

282. Describe with the help of diagram the natrue, size and position of the image formed when and object placed at centre of curvature of a concave mirror.

Watch Video Solution

283. Where will the image be formed by a concave mirror when an object is placed

between the pole and the focus point of the mirror?

Watch Video Solution

284. Draw the ray diagarm in each case to show the position and nature of the image formed when the object is placed:

in front of a convex mirror.

Watch Video Solution

285. Give the nature, position and size of the image formed by a convex lens when the object lies at 2 F

Watch Video Solution

286. Draw the ray diagarm in each case to show the position and nature of the image formed when the object is placed:

in front of a concave lens.

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287. 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

288. The absolute refractive indices of two media 'A' and 'B' are 2.0 and 1.5 respectively. If the speed of light in medium 'B' is $2 \times 10^8 \frac{m}{s}$,

calculate the speed of light in

Vacuum?

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289. The absolute refractive indices of two media 'A' and 'B' are 2.0 and 1.5 respectively. If the speed of light in medium 'B' is $2 \times 10^8 \frac{m}{s}$, calculate the speed of light in

Medium 'A'

Watch Video Solution

290. What is meant by power of a lens. Define its S.I unit. You have two lenses A and B of focal length +10 cm and -10 m respectively. State the nature and power of each lens. Which of the two lenses will form a virtual and magnified image of an object placed 8 cm from the lens?

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291. A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal

length 20 cm. the distance of the object from the lens is 15 cm. find the nature, position and size of the image.

Watch Video Solution

292. The refractive index of water is 4/3 and flint glass is 1.65. What is the refractive index of flint glass w.r.t. water?

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293. If the velocity of light in a medium is $1.2 \times 10^8 ms^{-1}$ and in air is $3 \times 10^8 ms^{-1}$. Find the refractive index of the material.\

Watch Video Solution

294. A convex lens has focal length of 20 cm. At what distance should be an object placed from the lens so that it forms a real image at 20 cm from the lens?

Watch Video Solution

295. A 2 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. the distance of the object from the lens is 15 cm. find the nature position and size of the image. Also find its magnification.

Watch Video Solution

296. What should be the focal length and nature of lens to be put in contact with a lens

of f=15 cm to get power of combination equal to 10 dioptre?

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297. The image of needle placed 45 cm from a lens is formed on a screen placed 90 cm on the otehr side of teh lens.Find the displacement of the image,if the object is moved to 5.0 cm away from the lens.

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298. Calculate the distance at which an object should be placed in front of a convex lens of ocal length 10 cm,so as to obtain an image twice the size of the object?

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299. A convex lens of focal length 20 cm can produces a real image of an object when it is 30 cm away. Find position and magnification of the image.

Watch Video Solution

300. Two lenses f powers-1.5 and +2.75 D are kept in contact.Find the focal length of the combination.

Watch Video Solution

301. A converging lens of 6 dioptre is combined with a diverging lens of 2 dioptre. Find out the power and focal length of the combiation.

Watch Video Solution

302. A 10 mm long apline is placed vertically in fornt of a concave mirror. A 5 mm long image of the alpin is formed at 30 cm in fornt of the mirro. The focal length of this mirror is

A. $-30cm$

B. $-20cm$

C. $-40cm$

D. $-60cm$

Answer:

Watch Video Solution

303. Under which of the following conditions a concave mirror can be 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 curvture.

Answer:

Watch Video Solution

304. 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.

Answer:

Watch Video Solution

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

A. 15 cm in fornt 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.

Answer:

Watch Video Solution

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

A. a concave mirror

B. a convex miror

C. a plane mirror

D. both concave as well as plane mirror.

Answer:

Watch Video Solution

307. In touches, 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

Answer:

Watch Video Solution

308. The law of reflection holds good for

A. plane mirror only

B. concave mirror only

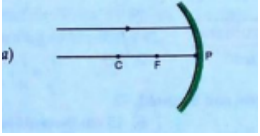
C. convex mirror only

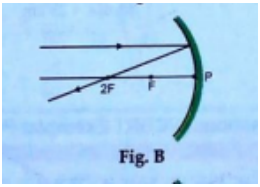
D. all mirror irrespective of their shapes.

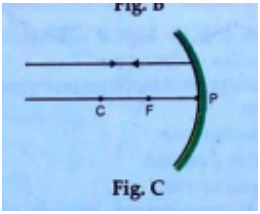
Answer:

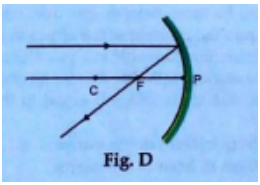
Watch Video Solution

309. Which of the following ray diagrams is correct for the ray of light incident on a concave mirror as shown in fig A, B, C and D?

A. 

B. 

C. 

D. 

Answer:

Watch Video Solution

310. 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 combination 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:

Watch Video Solution

311. Which of the following can be 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 mirros placed at 90° to each other

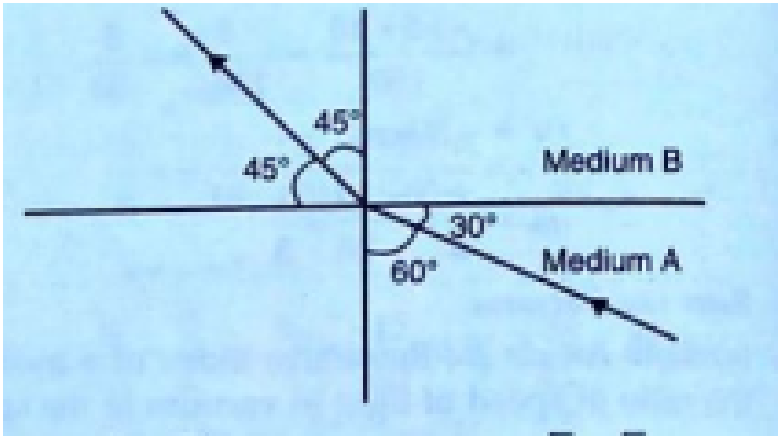
D. Concave mirrors as well as concave lens.

Answer:

Watch Video Solution

312. Figure below shows a ray of light as it travels from medium A to medium B. Refractive index of the medium B relatvie to

medium A is



A. $\frac{\sqrt{3}}{\sqrt{2}}$

B. $\frac{\sqrt{2}}{\sqrt{3}}$

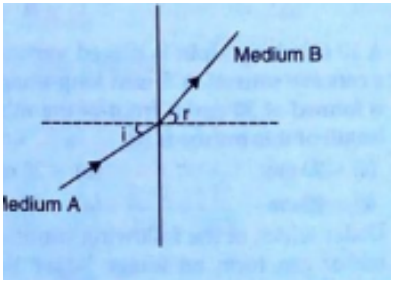
C. $\frac{1}{\sqrt{2}}$

D. $\sqrt{2}$

Answer:

Watch Video Solution

313. A light ray enterms 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

Answer:

Watch Video Solution

314. Which of the following statements is true?

A. A convex lens has 4 dioptre power having a focal length 0.25 cm

B. A convex lens has -4 dioptre power having a focal length 0.25 cm.

C. A concave lens has 4 dioptre power having a focal lengh 0.25 cm

D. A concave lens has -4 dioptre power having a focal length 0.25 cm.

Answer:

Watch Video Solution

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

A. Kerosene

B. Water

C. Mustard oil

D. Glycerine

Answer:

Watch Video Solution

Watch video solution

316. A concave lens forms of a real image of a point object placed on its principal axis. If the upper half of the lens is cut

A. the image will be shifted downward

B. The image will be shifted upward

C. The intensity of the image will decrease

D. None of the above

Answer:

Watch Video Solution

317. A convex lens of glasss has power P in air. If its is immersed in water, its power will be

A. more than P

B. less than P

C. P

D. more than P for some colours and less than P for other.

Answer:

Watch Video Solution

318. Refractive index of a medium with respect to air is $n = \sqrt{2}$ find the critical angle between the two medium

A. 30°

B. 90°

C. 45°

D. 60°

Answer:

Watch Video Solution

319. A screen is placed at a distance 40 cm away from an illuminated object A converging lens if placed between the source and screen and attempted is made to from an image on screen. If not position could be found. The focal length of the lens.

A. must be less than 40 cm

B. must be greater than 20 cm

C. must not be greater than 20 cm

D. must not be less than 10 cm

Answer:

Watch Video Solution

320. What is the angle between the incidence when the incident ray is normal to the interface or boundary separating two media?

A. 0°

B. 90°

C. 180°

D. 45°

Answer:

Watch Video Solution

321. In an experiment with a rectangular glass slab, for an angle of incidence of 60° in air, angle of refraction is measured to be r_1. When the glass slab is replaced by a hollow slab

filled with water, angle of refraction is measured to be r_2. Then

A. $r_2 = r_1$

B. $r_2 > r_1$

C. $r_2 < r_1$

D. cannot say

Answer:

Watch Video Solution

322. A convex lens is in the contact with concave lens. The magnitude of the ratio of their focal lengths is 2/3. Their equivalent focal length is 30 cm. what are the individual focal length

A. $-75,\ +50$

B. $+10,\ -15$

C. $+75,\ -50$

D. $-15,\ -10$

Answer:

Watch Video Solution

323. A ray of light falls on a plane mirror making an angle of 30° with the mirror. The angle of reflection is

A. 30°

B. 60°

C. 120°

D. 180°

Answer:

Watch Video Solution

324. A boy is running towards a plane mirror with a speed of $2ms^{-1}$.With what speed the image of the boy approach him?

A. 2m/s

B. zero

C. 4 m/s

D. None of the above

Answer:

Watch Video Solution

325. In which of the following mirrors image of an object is always virtual, erect and smaller in size than the object?

A. convex mirror

B. concave mirror

C. plane mirror

D. none of these

Answer:

Watch Video Solution

326. The linear magnification of a convex lens is -1, when object in front of the lens is

A. at infinity

B. at focus

C. at $2F_1$

D. between F_1 and $2F_1$

Answer:

Watch Video Solution

Watch Video Solution

327. An object is held at 40 cm from a concave lens of focal length 60 cm. the distance of the image from

A. $-40cm$

B. $-60cm$

C. 24 cm

D. $-24cm$

Answer:

Watch Video Solution

328. The focal length of a combination of convex lens of power 1 D and concave lens of power -1.5 D is

A. $-2m$

B. 2m

C. 2.5 m

D. 0.5 m

Answer:

Watch Video Solution

329. 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.

Answer:

Watch Video Solution

330. The law of reflection holds good for

A. plane mirror only

B. concave mirror only

C. convex mirror only

D. all mirror irrespective of their shapes.

Answer:

Watch Video Solution

331. 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 combination 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:

Watch Video Solution

332. 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.

Answer:

Watch Video Solution

333. True or false

A concave mirror is converging mirror.

Watch Video Solution

334. A ray of light falling normal to the mirror returns along the same path.Why?

Watch Video Solution

335. A coin present at the bottom of a beaker fille with water appears to be at a height. This is because of refraction.

Watch Video Solution

336. True or false

Red colour light travels the fastest in vacuum.

Watch Video Solution

337. True or false

The power of a convex lens of focal length 2m is 1/2 dioptre.

Watch Video Solution

338. Fill ups

A watch maker's glass is a ..... .

Watch Video Solution

339. Fill ups

Speed of light in water is.....m/s.

Watch Video Solution

340. Fill ups

A ray of light from air enters glass, it bends.....normal.

Watch Video Solution

341. Fill ups

An image is called.....when it can be taken on a screen.

Watch Video Solution

342. Fill ups

The focal length of a spherical mirror is determined by the .....of the mirror.

Watch Video Solution

343. How does the frequency of a beam of ultraviolt light change when it goes from air to glass?

Watch Video Solution

344. What is the power of a lens of focal length 50 cm?

Watch Video Solution

345. What is the angle between the incident ray and emergent ray passing through a rectangular glass slab?

Watch Video Solution

346. Given the refractive index of glass and water is $\frac{3}{2}$ and $\frac{4}{3}$ respectively. Find the refractive index of

glass with respect to water?

Watch Video Solution

347. Given the refractive index of glass and water is $\frac{3}{2}$ and $\frac{4}{3}$ respectively. Find the refractive index of

water with respect to glass.

Watch Video Solution

348. State the laws of reflection.

Watch Video Solution

349. Fill ups

A ray of light passes from optically rarer medium to optically denser medium at the same angle of incidence. The angle of refraction for optically denser meduim P, Q

and R are $30^\circ, 20^\circ, 15^\circ$. The speed of light will be minimum in..... .

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350. Draw a rays diagram showing the image formation by a convex lens when an object is placed?

between focus and twice the focal length of the lens?

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351. Draw a rays diagram showing the image formation by a convex lens when an object is placed?

at infinity?

Watch Video Solution

352. The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. If the image is three times the size of the flame and the distance between lens and image is 80 cm., at what

distance should be candle be placed from the lens? what is the nature of the image at a distance of 80 cm and the lens?

Watch Video Solution

353. Define power of a lens. What is its unit? One of student uses a lens of focal length 50 cm and another of -50 cm. What is the nature of the lens and its power used by each of them.

Watch Video Solution

354. If the radius of curvature of convex mirror is 40 cm and size of object is twice as that of the image,then the object distance is

A. 20 cm

B. 30 cm

C. 40cm

D. 60 cm

Answer:

 Watch Video Solution

355. A student obtained sharp image of the grill of a window on a scrren u sing a convex lens. For better results, the teacher suggested focussing of a distant free instead of the grill, in what direction should be the lens be moved for this purpose?

A. Away from the screen

B. Very far away from the screen

C. Behind the scrren

D. Towards the screen

Answer:

Watch Video Solution

Example

1. A concave mirror of focal length 20 cm forms a real image at a distance of 40 cm. find the position of the object.

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2. A convex mirror used on an automobile has a radius of curvature of 3 m. if a truck is located 5 m from this mirror, find the position, nature of the image and its magnification.

Watch Video Solution

3. An object 1 cm high is place on the axis and 15 cm from a concave mirror of focal length 10 cm. find the position, nature, magnification and size of the image.

Watch Video Solution

4. The image formed by a concave mirror is half in size of the object. If object is placed at 10 cm from the mirror, where is the image formed?

Watch Video Solution

5. An object 5 cm high is placed at a distance of 10 cvm from a convex mirror of radius of

curvature 30 cm. find the nature, position and size of the image. If the objects is moved away from the mirror, how does the image shift.

Watch Video Solution

6. When an object is placed at a distance of 60 cm from a convex spherical mirror, the magnification produced is $1/2$ .Where should the object be placed to get a magnification of $1/3$?

Watch Video Solution

7. Find the position of an object which when placed in front of a concave mirror of a focal length 20 cm produces a virtual image which is a thrice the size of object.

Watch Video Solution

8. An object is placed 10 cm from a concave mirror of radius of curvature 15 cm. calculate the position, nature and magnification of the image formed.

Watch Video Solution

9. An object is placed 15 cm from a convex mirror of radius of curvature 90 cm.Calculate the image position and magnification.

Watch Video Solution

10. A 4.5 cm needle is placed 12 cm away from a convex mirror of focal length 15 cm. Give the location of the image and the magnification.

Describe what happens as the needle is moved farther from the mirror.

Watch Video Solution

11. What is the speed of light?

Watch Video Solution

12. If refractive index of glass w.r.t. air is 1.55, then what is the refractive index of air w.r.t. glass.

Watch Video Solution

13. The refractive index of water is 4/3 and flint glass is 1.65. What is the refractive index of flint glass w.r.t. water?

Watch Video Solution

14. A ray of light passes from to air to glass at an angle of incidence of 60°. The refractive

index of glass is 1.5. Calculate the angle of refraction.

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15. Monochromatic light of wavelength 589 nm is incident from air on a water surface. What are the wavelength, frequency and speed of-refracted light. Refractive index of water is 1.33

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16. The refractive index of diamond is 2.42 and that of glass is 1.5. find the ratio of velocity of light in glass to velocity of light is diamond.

Watch Video Solution

17. A ray of light of frequency of $5 \times 10^{14} Hz$ is passed through a liquid.the wavelength of light measured inside the liquid is found to be $450 \times 10^{-9} m$.Calculate refractive index of the liquid.

Watch Video Solution

18. Velocity of light in a medium is $1.5 \times 10^8 ms^{-1}$. Find the refractive index.

Watch Video Solution

19. The refractive index of diamond is:

Watch Video Solution

20. A ray of light passes from air to glass. The glass of incidence is 45°. Find the angle of refraction, given refractive index of glass is 1.5.

Watch Video Solution

21. Velocity of light is equal to

Watch Video Solution

22. An object of 3 cm height is placed at a distance of 60 cm from a convex mirror of focal length 30 cm.Find the position and size of the image formed.

Watch Video Solution

23. An object 5.0 cm of 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.

Watch Video Solution

24. Define focal length of a lens

Watch Video Solution

25. An object of 3 cm height is placed at a distance of 60 cm from a convex mirror of focal length 30 cm.Find the position and size of the image formed.

Watch Video Solution

26. The image obtained with a convex lens is erect and its lenth is four times the length of the object.If the focal length of the lens is 20 cm,calculate the object and image distance.

Watch Video Solution

27. A pin of height 2 cm is placed on the principal axis of a converging lens. An inverted image of size 1 cm is formed at a distance of 40 cm from the lens. Find the focal length of

the lens and the distance of the pin from the lens.

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28. The image of the needle placed 10 cm from a lens is formed on a wall 20 cm on the other side of the lens. Find the focal length of the lens and size of the image formed if the size of the needle is 2.5 cm.

Watch Video Solution

29. An object of size 3 cm is placed 14 cm in front of a concave lens of focal length 21 cm. describe the image produed by the lens.

Watch Video Solution

30. Two thin converging lenses of focal lengths 0.15 m and 0.30 m are held incontact with each other. Calculate the power and focal length of the combination.

Watch Video Solution

31. Find the focal length and nature of a lens which should be placed in contact with a lens of focal length 10 cm so that the power of the combination becomes 5 dioptre.

Watch Video Solution

32. The image of a candle flame placed at a distance of 30 cm form a sphericla lens is formed on a screen placed on the other side of the lens at a distance of 60 cm form the

optical centre of the lens. Identify the type of lens and calculate the focal length. if the height of the flame is 3 cm, find the height of its image.

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33. Find the power of a convex lens which forms a real and inverted image of magnification -1 of an object placed at a distance of 20 cm from its opticla centre.

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34. Define the principal focus of concave mirror.

Watch Video Solution

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

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36. Name a mirror which can give an erect and enlarged image of an object

Watch Video Solution

37. Why do we perfer a convex mirror as back view mirror in vehicles?

Watch Video Solution

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

Watch Video Solution

39. A concave mirror produces three times magnified real image of an object placed at a 10 cm in front of it. Find where will the image be formed?

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

Watch Video Solution

41. Light enters from air to glass having refractive index 1.50 what is speed of light in glass? Speed of light in vacuum is 3×10^8 m s^{-1}.

Watch Video Solution

42. Find out from table 10.3 of the text-bool, the medius having highest optical density. Also find the midum with lowest optical density?

Watch Video Solution

43. Refractive indices of kerosene,turpentine and water are 1.44, 1,47 and 1.33 respectively, in which material does the light travel fastest and why?

Watch Video Solution

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

Watch Video Solution

45. Define 1 dioptre of power of a lens

Watch Video Solution

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

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47. Find the power of a concave lens of focal length 3 m.

Watch Video Solution

48. Which one of the following material cannot be used to make a lens?

A. Water

B. Glass

C. Air

D. Clay

Answer:

Watch Video Solution

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

A. between the principal focus and centre of curvature

B. at the centre of curvature

C. beyond he centre of curvature

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

Answer:

Watch Video Solution

50. Where should an object be placed in front of a convex lens to get a 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:

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

A. Both concave

B. Both convex

C. The mirror is concave but the lens of convex

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

Answer:

Watch Video Solution

52. No matter how far you stand from a spherical mirror, yours image appears erect. The mirror may be

plane

concave

convex

either plane or convex.

Watch Video Solution

53. Which of the following lenses would you prefer to use while reading small letters in a dicionary?

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:

Watch Video Solution

54. We wish to obtain an erect image of an object, using a concave mirror of focal length 15cm 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 object? Draw a ray diagram to show the image formation in this case.

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55. Name the type of mirror used in the following situation: head light of a car.

Watch Video Solution

56. Name the type of mirror used in the following situation: Sider/rear-view mirror of a vehicle

Watch Video Solution

57. Name the type of mirror used in the following situation: Solar furnace

Watch Video Solution

58. One half of a convex lens is covered with a black paper .Will this lens produce a complete image of the object? Explain your observation

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

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60. A concave lens of focal length 15cm forms an image 10 cm from the lens. How far is the object placed from the lens? Draw ray diagram.

Watch Video Solution

61. An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. Find the position and nature of the image

Watch Video Solution

62. The magnification produced by plane mirror is +1. What does this mean?

Watch Video Solution

63. An object 5.0 cm of 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.

Watch Video Solution

64. 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 the screen be placed, so that a sharp focussed

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

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

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66. A doctor has prescribed a corrective lens of power+ 1.5 D.Find the focal length of lens.Is

prescribed lens diverging or converging?

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67. Under what condition in an arrangement of two plane mirrors incident ray and reflected ray will always to be parallel to each other, whatever may be angle of incidence. Show the same with the help of diagram.

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68. Draw a ray diagram to show the image formation by a concave mirror, when the object is kept between its focus and the pole.

Watch Video Solution

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

between focus and centre of curvature of the mirror.

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70. Describe with the help of diagram the natrue, size and position of the image formed when and object placed at centre of curvature of a concave mirror.

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

a little beyond centre of curvature of the mirror.

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

at infinity.

Watch Video Solution

73. Draw a rays diagram showing the image formation by a convex mirror when an object is placed

at infinity?

Watch Video Solution

74. Draw a rays diagram showing the image formation by a convex mirror when an object is placed

at finite distance from the mirror.

Watch Video Solution

75. Size of image of an object by a mirror having a focal length of 20 cm is observed to be reduced to 1/3rd of its size. What distance the object has been placed from the mirror? What is the nature of the image and the mirror?

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76. Identify the device used as a sphercal mirror or lens in following cases, when the image formation is virtual and erect in each case.

Object is placed between infinity and device, image formed is diminished and between pole and focus,behind it.

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77. Identify the device used as a sphercal mirror or lens in following cases, when the image formation is virtual and erect in each case.

Object is placed between the focus and device, image formed is enlarged and on the same size as that of the object.

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78. Identify the device used as a sphercal mirror or lens in following cases, when the image formation is virtual and erect in each case.

Object is placed between infinity and device, image formed is diminished and between focus and optical centre on the same side as that of the object.

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79. Identify the device used as a sphercal mirror or lens in following cases, when the image formation is virtual and erect in each case.

Object is placed between infinity and device, image formed is diminished and between pole and focus,behind it.

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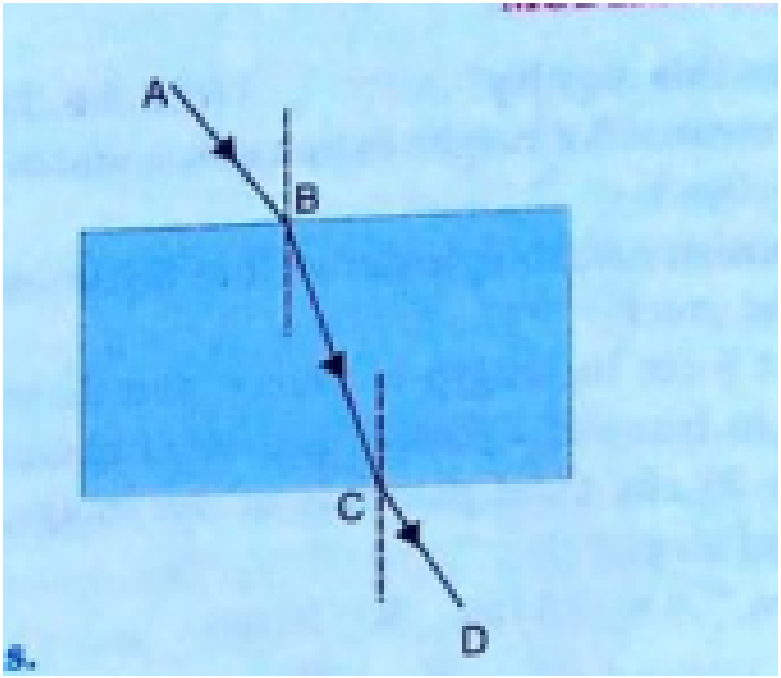
80. Why does a light ray incident on a rectangular glass slab immersed in any medium emerges parallel to itself? Explain using a diagram.



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

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82. 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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83. Refractive index of 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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84. A convex lens of focal length 20 cm can produced a magnified virtual as well as real image? Is this a correct statement? If yes, where shall be object be placed in each case for obtaining these images?

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85. Sudha finds out that the sharp image of the window pane of the science laboratory is formed at a distance of 15 cm from the lens. She not tries to focus the building visible to

her outside the window instead of the window pane without disturbing the lens. in which direction will she move the screen to obtain a sharp image of the building? what is the approximate focal lenght of this lens?

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86. How are power and focal length of a lens related? You are provided with two lenses of focal length 20 cm and 40 cm respectively.

Which lens will you use to obtain more convergent light?

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87. Draw a ray diagam showing the path rays of light in when it enters with oblique incidence

from air into water?

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88. Draw a ray diagam showing the path rays of light in when it enters with oblique incidence

from water into air.

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89. Draw a rays diagram showing the image formation by a convex lens when an object is placed?

between optical centre and focus of the lens?

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90. Draw a rays diagram showing the image formation by a convex lens when an object is placed?

between focus and twice the focal length of the lens?

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91. Draw a rays diagram showing the image formation by a convex lens when an object is

placed?

at twice the focal length of the lens.

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92. Draw a rays diagram showing the image formation by a convex lens when an object is placed?

at infinity?

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93. Draw a rays diagram showing the image formation by a convex lens when an object is placed?

at the focus of the lens.

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

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

at the focus of the lens.

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

between focus and twice the focal length of the lens.

Watch Video Solution

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

beyong twice the focal length of the lens.

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98. The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. If the image is three times the size of the flame and the distance between lens and image is 80 cm., at what distance should be candle be placed from the lens? what is the nature of the image at a distance of 80 cm and the lens?

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99. Define power of a lens. What is its unit? One of student uses a lens of focal length 50 cm and another of -50 cm. What is the nature of the lens and its power used by each of them.

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100. A student focussed the image of a candle flame on a white screen using a convex lens. He notes down the position of the candle

screen and the lens as under.

Position of candle=12.0 cm

Positio of convex lens=50.0 cm

Position of the screen=88.0 cm

what is the focal length of the convex lens?

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101. A student focussed the image of a candle flame on a white screen using a convex lens. He notes down the position of the candle screen and the lens as under.

Position of candle=12.0 cm

Positio of convex lens=50.0 cm

Position of the screen=88.0 cm

what is the focal length of the convex lens?

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102. A student focussed the image of a candle flame on a white screen using a convex lens. He notes down the position of the candle screen and the lens as under.

Position of candle=12.0 cm

Positio of convex lens=50.0 cm

Position of the screen=88.0 cm

What will be the nature of the image formed if he further shifts the candle towards the lens?

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103. A student focussed the image of a candle flame on a white screen using a convex lens. He notes down the position of the candle screen and the lens as under.

Position of candle=12.0 cm

Positio of convex lens=50.0 cm

Position of the screen=88.0 cm

Draw ray a diagram to whow hte formation of the image in case as said above.

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104. Mention the type of mirrors used as rear view mirrors. List reasons to justify your answer in each case.

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105. Mention the type of mirrors used as shaving mirror. List reason to justify your answer in each case.

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106. Which kind of mirror is used in the head light or motor car and why?

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107. What are the values of angle of incidence $\angle i$ and angle of reflection r for normal incidence of light on a plane mirror.

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108. Which type of mirror is used to watch the activities of customer in big shoppling stores and why?

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109. Define the SI unit of power of lens.

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110. State Snell's law of refraction of light.

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111. Why is absolute refractive index always greater than the one.

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112. A ray of light is incident on the surface of a glass plate of refractive index 1.536 at the polarising angle.Calculate the angle of refraction.

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113. If on applying cartesian sign convention for spherical lenses, the image distacnce obtained is negative, state the significance of the negative sign.

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114. At which position of object will be the magnification be 1 in case of convex lens?

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115. At which position of object will be the magnification be 1 in case of concave mirror?

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116. Discuss the case in which a convex lens behaves as a diverging lens.

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117. A concave mirror of focal length 'f' can from a magnified erect as well s inverted image of an object placed in front of it. State the position of the object with respect to the mirror in each case.

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118. How will the following be affecte on cutting a converging lens into two equal halves along the principal axis?

focal length?

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119. How will the following be affecte on cutting a converging lens into two equal

halves along the principal axis?

intensity of image formed by half lens.

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120. How can you distinguish between a plane mirror, a convex mirror and a concave mirror, just by looking at the images formed by them.

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121. The lens prescribed by doctor has a power of +2.0 D. What does it mean.

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122. A girl in a mirror laughing hourse finds her face appearing highly magnified, lower position of her body of the same size but laterally inverted and middle position of the body highly diminished in size, can you guess the design of mirror.

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123. It is desired to obtain an erect image of an object using a concave mirror of focal length 20 cm

What can be the range of distance of the object from the mirror.

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124. It is desired to obtain an erect image of an object using a concave mirror of focal length

20 cm

Will the image be bigger or smaller than the object.

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125. The magnification produced by a spherical mirrror is -3. list four information you can obtain from this statement about the mirror/image.

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126. An object moves from infinity towards the concave mirror, discuss the nature of image formed.

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127. Give the example of transparent, translucent and opaque media of light.

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128. How do you draw a normal at a point on a spherical mirror?

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129. A ray of light pasing thourgh the centre of curvature of a concave mirror retraces its path. Explain.

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130. Why is concave mirror used by doctors?

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131. Can a concave miror from a virtual image with magnification greater than 1?

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132. If you are given a part of hollow spherical glass, how will you convert it into a concave

mirror?

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133. What is the differnce between the virtual image produced by

concave mirror and plane mirror.

Watch Video Solution

134. What is the differnce between the virtual image produced by

convex mirror and concave mirror.

Watch Video Solution

135. The mirror used in search light is parabolic and not concave comment.

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136. A point source S is placed in water. Name the type of beam of light it emits. This beam of

light after coming out from water converges or diverges why?

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137. Can a convex lens behave as a diverging lens?

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138. The refractive index of air with respect to glass is defined as $n_{ga} = \frac{\sin i}{\sin r}$

Write a similar expression for n_{ag} in terms of I and r.

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