PHYSICS

BOOKS - MBD

LIGHT:REFLECTION AND REFRACTION

Example

1. Define the principal focus of concave mirror.

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

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

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

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

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

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

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8. 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}.

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

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10. 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?

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

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12. Define 1 dioptre of power of a lens

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13. What is power of lens? Give commercial unit of power?

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14. 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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15. Find the power of a concave lens of focal length 2 meters?

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

A. water

B. glass

C. clay

D.

Answer:

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17. 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 principal focus and the centre of curvature

B. at centre of curvature

C. beyond centre of curature

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

Answer:

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18. 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 principal focus of the lens

B. at twice the focal length of lens.

C. at infinity

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

Answer:

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19. 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 are concave

B. both are convex

C. mirror is cancave and lens is convex

D. mirror is convex but lens is concave.

Answer:

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20. No matter how you stand from a mirror, your image apperas erect.The mirror is likely to be:

A. plane only

B. concave only

C. convex only

D. either plane or convex

Answer:

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

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:

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

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

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

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26. 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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27. 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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28. 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.

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29. 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

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

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31. 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.

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

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34. 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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35. Form the image in case an object is moved from infinity to the concave mirror.

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36. 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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37. What is refraction of light?

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38. Draw the ray diagrams and find position,nature and size of image formed by a convex lens,when object is placed: between F and 2F

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39. Draw the ray diagrams and find position,nature and size of image formed by a convex lens,when object is placed: beyodn 2 F

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40. Draw the ray diagrams and find position,nature and size of image formed by a convex lens,when object is placed:At F.

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

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42. What is light, Give the nature of light.

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43. Write the characteristics of light.

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44. What are the various artificial sources of light ? Give examples

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45. What is reflector?

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46. What is reflection of light? State the laws of reflection of light.

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47. What is the angle of incidence when incident ray falls normal to the mirror?

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48. What is the angle of reflection when a ray of light is incident normally to the mirror?

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

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50. Define the terms:Spherical mirror

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51. Define the terms: concave mirror convex mirror

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52. Define the terms: aperture

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53. Define the terms: Centre of curvature

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54. Define the terms:Pole

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55. Define the terms: principal focus

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56. Define the terms : focal length.

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57. What is the relation between focal length and radius of curvature of a concave mirror? What is focal length of a plane mirror?

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58. When the image formed by a concave mirror is at infinity then what is the position of the object?

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59. Where should an object be placed so that its real and same size image is formed?

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60. When is virtual and magnified image of an object formed in a concave mirror? Show with the help of a diagram

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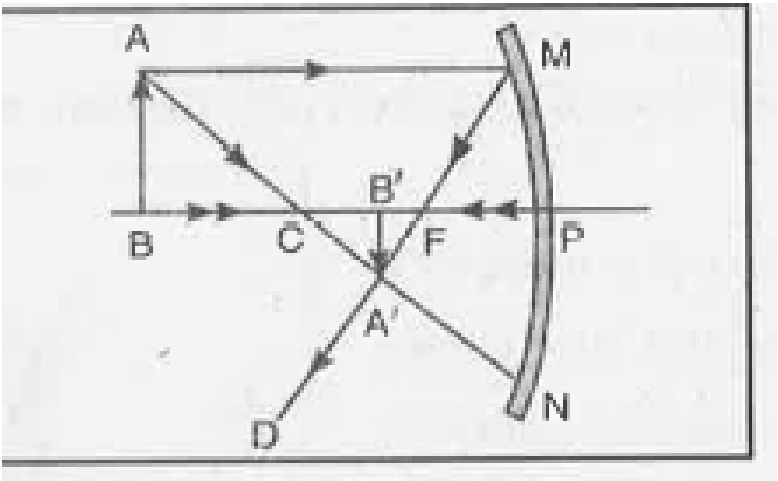
61. Which mirror is shown in the diagram? Where is object placed in relation of the mirror? Write characteristics of the image

formed:



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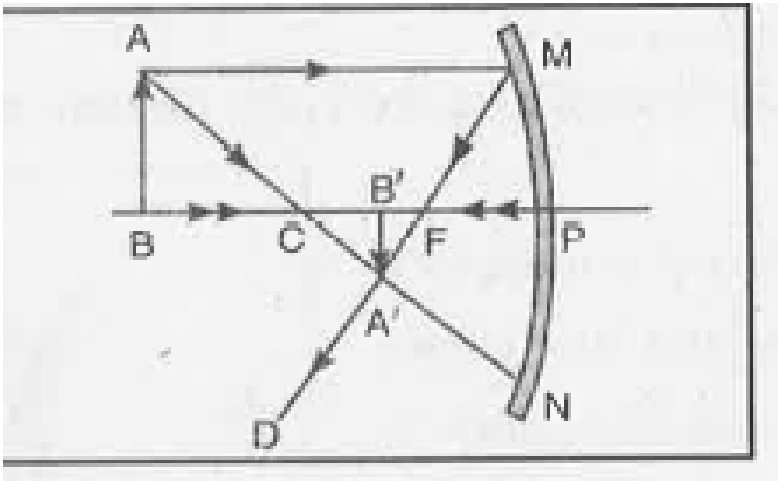
62. Which mirror is shown in the diagram? Where is object placed in relation of the mirror? Write characteristics of the image

formed:



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63. Which mirror is used as a shaving mirror and why? Explain its working with the help of a ray diagram

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

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65. Which mirror has wider field of view?

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66. Which mirror is preferred as a driver's mirror and why?

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67. Where should an object be placed with respect to a concave mirror to get real and enlarged image? Show with the help of ray diagram.

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68. Write points of difference between convex mirror and concave mirror.

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69. How will you distinguish between plane mirror,convex and concave mirror without touching ?

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70. Define magnification of spherical mirror. What is the magnification produced in a plane mirror?

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71. What is magnification?

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72. Write the characteristics of image formed in a plane mirror

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73. Differentiate between a real image and a virtual image.

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74. Explain with the help of a diagram the formation of image formed by a plane mirror.

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75. Write uses of shperical mirrors

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

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77. What are new cartesian sign coventions used for reflectionin spherical mirror? What is the mirror formula?

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78. What is the effect when light enters from a rarer medium to a denser medium? Explain with diagram

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79. What is the effect of density of bending of refracted ray during refraction?

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80. When light enters from water to glass what is the change in its velocity?

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81. If a ray of light travelling in glass enters into water will it bend towards or away from the normal?

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82. Find relation for refractive index in terms of real depth and apparent depth.

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83. Why does a pencil immersed in water appear bent and short? Explain with the help of a ray diagram?

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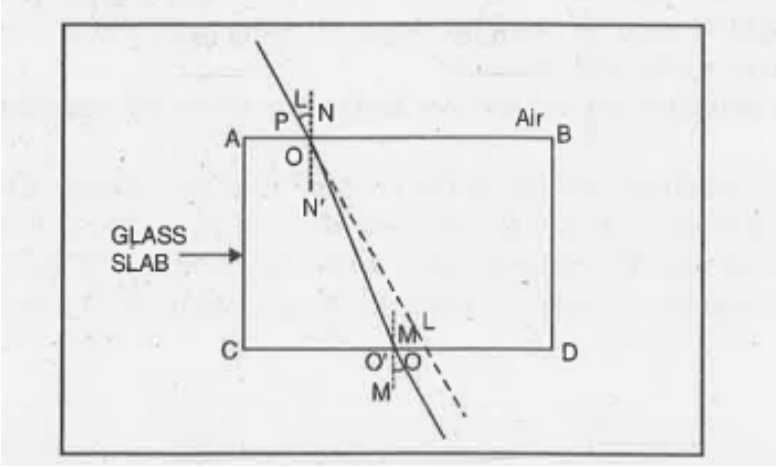
84. Which phenomenon is shown in the figure? Give its definition and give laws of this

phenomenon?



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85. Define Snell's law. What is refractive index?

Write its mathematical formula.

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86. What is lens?

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87. Define the terms: 1 Optical centre 2.Principal axis 3. principal focus of lens.

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88. How is image formed by a concave lens? Show by drawing diagram as to what will be

the position and nature of the image formed by a concave lens?

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89. What is lens formula ? Give its sign conventions

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90. What is magnification of a lens?

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91. Compare convex and concave lenses

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92. What are the differences between reflection and refraction?

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93. Define 1 dioptre of power of a lens

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

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95. The radius of curvature of a convex mirror is 40 cm what is its focal length?

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96. 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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97. 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

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98. 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}.

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99. Light travels from air to water of refractive index 1.33. calculate the speed of light in water, if speed of light in air is 3.0×10^8 m/s

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100. Refractive index of water w.r.t. air is $\frac{4}{3}$ and that of glass w.r.t air is $\frac{2}{3}$ what will be the refractive index of glass w.r.t water ?

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101. An object is 2m away from a lens. Which forms an erect image $\frac{1}{4}th$ the size of the object, determine the focal length of the lens.What type of the lens is this?

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102. A convex lens of focal length 20 cm is placed at a distance of 24 cm from the screen how far from the lens should an object be placed so as to from a real image on the screen. Also find the nature and magnification of the image produced.

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103. A concave lens has focal length of 15 cm. At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens? Also find the magnification produced by the lens.

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104. A convex lens of power 4D is placed at a distance of 40 cm from a wall at what distance

from the lens should a candle be placed so that its image is formed on the wall?

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105. Which mirror has a widset field of view?

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106. Define a spherical mirror.

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107. What is concave mirror

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108. What is concvex mirror?

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109. Define the pole of a mirror

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110. Define principal focus of a mirror.

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111. Define the focal length of mirror

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112. What is refraction of light?

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113. Define refractive index?

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114. What is a lens?

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115. Define power of a lens

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116. Define a dioptre

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117. Define focal length of a lens

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118. What is the nature of the mirror having focal length - 15 cm?

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119. A mirror has magnification 0.4, What type of the mirror is and what type of the image is formed?

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120. What is curvature of a mirror? What is its value for plane mirror?

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121. A ray strikes the mirror normally, what is the angle of incidence?

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122. The power of a lens is 2 dioptre its focal length will be.... .

A. 20 cm

B. 40 cm

C. 10 cm

D. 50 cm

Answer:

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123. .....froms virtual and same size of image of an object

A. concave mirror

B. convex mirror

C. plane mirror

D. none of these

Answer:

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124. The image of an object formed by a convex mirror is always.....

A. real, inverted and smaller than the object

B. virtual,inverted and smaller than the object

C. virtual,erect and smaller than the object

D. virtual,erect and bigger than the object.

Answer:

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125. ....is used in motor vehicles to take rear view.

A. concave mirror

B. plane mirror

C. convex mirror

D. any sperical mirror

Answer:

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126. $\frac{\sin i}{\sin r}$ relation was given by .....

A. newton

B. raman

C. snell

D. faraday

Answer:

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127. The focal length of a lens is expressed by which of the following:

A. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

B. $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

C. $\frac{1}{f} = \frac{1}{u} = \frac{1}{v}$

D. $\frac{1}{f} = \frac{1}{u} - (1)(u)$

Answer:

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128. The relation between the radius of curvature (R) and focal length (f) of a concave mirror is.....

A. $F = R$

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

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

D. $R = \frac{f}{4}$

Answer:

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129. Where will the real and inverted image of an object placed at the centre of curvature of a concave mirror will be formed?

A. at f

B. at centre of curvature

C. betwee c and f

D. at infinity

Answer:

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130. The mirror used for getting real and enlarged image is..... .

A. convex mirror

B. concave mirror

C. plane mirror

D. none of these

Answer:

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131. Parallel rays incident on a mirror,after reflection converge at a point, then the mrirror will be ..... .

A. plane

B. concave

C. convex

D. none of these

Answer:

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132. The unit of power of lens is..... .

A. coulomb

B. watt

C. joule

D. dioptre

Answer:

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133. Power of a lens is -5d, its focal length is:

A. 20 cm

B. $-20cm$

C. $-0.2m$

D. 5 cm

Answer:

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134. 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:

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135. Shaving mirrors are-

A. convex mirrors

B. plane mirror

C. concave mirrors

D. parabolic mirrors

Answer:

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136. Which of the following is the property of light?

A. reflection

B. refraction

C. rectilinear propagation

D. all of these

Answer:

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137. Twinkling of stars is due to atmospheric:

A. reflection of light

B. dispersion of light

C. interference of light

D. refracionof light

Answer:

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138. Defect of vision that cannot be corrected by spectacles is:

A. Myopia

B. presbyopia

C. cataract

D. hypermetropia

Answer:

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

A. clay

B. glass

C. water

D. plastic

Answer:

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140. Where should object be placed in front of a convex lens to get real image of the size of object?

A. at principal focus of the lens

B. at twice the focal length of lens.

C. at infinity

D. between opitcal centre of the lens and its principapal focus.

Answer:

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141. 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 are concave

B. both are convex

C. mirror is cancave and lens is convex

D. mirror is convex but lens is concave.

Answer:

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142. No matter how far you stand from a mirror,your image appear erect.The mirror is likely to be:

A. plane only

B. concave only

C. convex only

D. either plane or convex

Answer:

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143. The refractive index of diamond is:

A. 2.42

B. 2.43

C. 2.45

D. 2.4

Answer:

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144. A ray of light travelling in a glass merges into air, it will bend:

A. Towards the normal

B. away from the normal

C. Goes along the normal

D. all of these

Answer:

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145. A concave mirror forms image inverted and equal in size, when object is placed at..... .

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146. A..... Mirror is used to see the rear view in cars.

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147. The ratio of sine of angle of incidence to the sine of angle of refraction is called..... .

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148. When a beam of light passes form optically rarer medium to optically denser medium,it bends.....the normal.

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149. ...is the unit of power of the lens

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150. A virtual and enlarged image is formed by a .....mirror.

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