PHYSICS

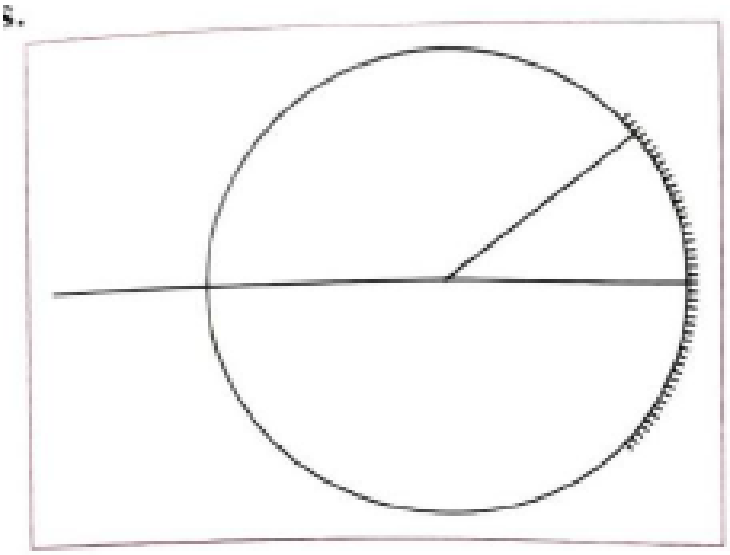
BOOKS - NAVNEET PUBLICATION

LENSES

Solved

1. Indicate the following terms related to spherical mirrors in figure: pole , centre of curvature , radius of curvature , principal

focus.



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2. How are concave and convex mirrors constructed ?

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3. What are real and virtual images ? How will you find out whether an image is real or virtual ? Can a virtual image be obtained on a screen ?

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4. What is the cartesian sign convention used for spherical mirrors ?

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Exercise

1. Fill in the blanks :

The focal length of a ..... lens is positive.

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2. Fill in the blanks :

The focal length of a ..... lens is negative.

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3. Fill in the blanks :

The magnification produced by a ..... lens is always positive.

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4. Fill in the blanks :

The power of a ..... lens is positive.

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5. Fill in the blanks :

The power of a ..... lens is negative.

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6. Fill in the blanks :

The focal length of a lens with power 2.5 D is .....

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7. Fill in the blanks :

The power of a lens with focal length 20 cm is .....

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8. Fill in the blanks :

The minimum distance of distinct vision for a normal human eye is.....

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9. Fill in the blanks :

If two lenses with focal lengths 10cm and 20 cm respectively are kept in contact with each other , the effective power of the combination is .....

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10. Fill in the blanks :

A ..... lens is used as a simple microscope.

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11. Choose the correct alternative and write it along with its alloted alphabet:

Inside water, an air bubble behaves.....

A. like a flat plate

B. like a concave lens

C. like a convex lens

D. like a concave mirror

Answer:

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12. Choose the correct alternative and write it along with its alloted alphabet:

..... Represents the lens formula.

A. 1/v+1/u=1/f

B. 1/v-1/u=1/f

C. 1/v+1/u=2/f

D. 1/u-1/v=1/f

Answer:

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13. Choose the correct alternative and write it along with its alloted alphabet:

The power of a convex lens of focal length 25cm is.....

A. 5D

B. 6D

C. 4D

D. 1D

Answer:

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14. Choose the correct alternative and write it along with its alloted alphabet:

A lens does not produce any deviation of a ray of light passing through.....

A. its centre of curvature

B. its optical centre

C. its principal focus

D. an axial point at a distance 2 F from its centre

Answer:

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15. Choose the correct alternative and write it along with its alloted alphabet:

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

A. virtual and erect

B. real and erect

C. virtualand inverted

D. real and inverted

Answer:

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16. Choose the correct alternative and write it along with its alloted alphabet:

A convex lens forms a virtual image of an object placed.....

A. at infinity

B. at a distance 2 F from the lens

C. At a distance F from the lens

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

Answer:

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17. Choose the correct alternative and write it along with its alloted alphabet:

When an object is placed at 2F_1 of a convex lens its image is formed.....

A. at F_1

B. at F_2

C. beyond2F_2

D. on the same side as the object

Answer:

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18. Choose the correct alternative and write it along with its alloted alphabet:

To object an image of the same size as that of an object with the help of a convex lens, the object should be placed

A. at infinity

B. beyond F_1

C. between F_1 and 2F_1

D. at 2F_1

Answer:

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19. Choose the correct alternative and write it along with its alloted alphabet:

When an object is placed between O and F_1 in front of a convex lens , the image formed is.....

A. between F_1 and $2F_1$

B. beyond $2F_1$

C. at F_1

D. between F_1 and O on the same side as the object

Answer:

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20. Choose the correct alternative and write it along with its alloted alphabet:

When an object is placed at any finite distance from a concave lens, the image is formed.....

A. enlarged and erect

B. diminished and erect

C. real and enlarged

D. diminished and inverted

Answer:

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21. Choose the correct alternative and write it along with its alloted alphabet:

A student obtained a clear image of window

grills on the screen using a convex lens. But the teacher told him to get the image of a tree far away , instead of the window. To get a clear image , the lens must be.....

A. moved towards the screen

B. moved away from the screen

C. moved behind the screen

D. moved far away from the screen

Answer:

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22. Choose the correct alternative and write it along with its alloted alphabet:

The image obtained while finding the focal length of a convex lens is .....

A. real and erect

B. virtual and erect

C. real and inverted

D. virtual and inverted

Answer:

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23. Choose the correct alternative and write it along with its alloted alphabet:

For the normal human eye , the near point is at ..... cm.

A. 10

B. 20

C. 25

D. 30

Answer:

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24. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

Power of a lens , P = 1/f

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25. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

If the power of a lens is 2 D , its focal length = 0.5 m.

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26. State whether the following statements are true or false : (If a statement is false ,

correct it and rewrite it.) :

A concave lens is converging lens.

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27. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A convex lens is converging lens.

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28. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A concave lens always forms a virtual image.

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29. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A convax lens always forms a virtual image..

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30. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

Due to the light sensitive cells in the eye , we get information about the brightness or dimness of the object and the colour of the object.

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31. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The focal length of a concave lens is negative .

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32. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The magnification produced by a concave lens

is positive or negative depending on the object distance.

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33. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The magnification produced by a convex lens is positive or negative depending on the object distance.

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34. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A concave lens is used as a magnifying glass.

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35. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A convex lens is used as a simple microscope.

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36. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A concave lens is used to correct myopia.

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37. State whether the following statements are true or false : (If a statement is false , correct

it and rewrite it.) :

A convex lens is used to correct hypermetropia.

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38. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A simple microscope is used for watch repairs.

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39. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

When red light falls on the eyes ,the cells responding to red light get excited more than those responding to other colours and we get sensation of red colour.

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40. State whether the following statements are true or false : (If a statement is false ,

correct it and rewrite it.) :

When an object is placed in front of a concave lens , its image is obtained on the opposite side of the object.

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41. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The image formed by a concave lens is always virtual.

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42. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The principal focus of a convex lens is virtual.

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43. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

An object of height 2 cm forms an image of height 3 cm when placed in front of a concave lens.

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44. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

Absense of rod like cells results in colour blindness.

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45. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

Nearsightedness can be corrected using spectacles having convex lenses.

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46. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

Farsightedness can be corrected using spectacles having convex lenses of suitable focal length.

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47. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

As one grows old , ciliary muscles become weak.

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48. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

In a simple microscope , the object is placed within the focal length of the convax lens.

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49. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

A compound microscope forms an erect and real image of a small object.

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50. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

In a compound microscope , a real image acts as an object for the eyepiece.

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51. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

In television , we see a continous picture due to persistence of vision.

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52. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The conical cells can respond differently to red , green and blue colours.

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53. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The rod like cells respond to colours and communicate the presence of colours in thr retinal image of the brain .

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54. State whether the following statements are true or false : (If a statement is false , correct it and rewrite it.) :

The conical cells respond to the intensity of light and communicate the degree of brightness to the brain.

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55. State whether the following statements are true or false : (If a statement is false ,

correct it and rewrite it.) :

Generally , using the same objective lens, but different eyepieces , different magnification can be obtained.

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56. Find the odd one out and give the reason :

Simple microscope , compound microscope , Telescope , Myopia

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57. Find the odd one out and give the reason :

Myopia , Presbyopia , Hypermetropia , Spectrometer

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58. Find the odd one out and give the reason :

Presbyopia , Retina , Nearsightedness , Farsightedness

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59. Find the odd one out and give the reason :

Compound microscope, Kaleidoscope , Simple microscope , Astronomical telescope

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60. Find the odd one out and give the reason :

TV , Motion picture , Complete circle formed by a revolving burning incense stick , Colour blindness

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61. Find the odd one out and give the reason :

Planets, Stars , Satellite , Rainbow

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62. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Nearsightedness : Elongated eyeball :: Farsightedness : .....

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63. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Convex lens : Converging :: Concave lens : .....

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64. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Object at 2F_1 of a convex lens : image at 2F_2 :: Object at F_1 : .....

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65. Considering the correlation between the word of the first pair , pair of third word

accordingly with proper answer OR write the correlated answer:

Magnification positive : Erect image :: Magnification negative : .....

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66. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Convex lens : Positive power of the lens :: Concave lens : .....

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67. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

1/ f (in meter) : Power of the lens (in dioptre) :: Image distance/ object distance : .....

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68. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Focal length : Metre :: Power of a lens : .....

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69. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the

correlated answer:

Iris : Pupil :: Ciliary muscles : .....

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70. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Nearsightedness :Concave lens :: Farsightedness : .....

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71. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Nearsightedness : image in the front of the retina :: Farsightedness : .....

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72. Considering the correlation between the word of the first pair , pair of third word

accordingly with proper answer OR write the correlated answer:

Observation of stars and planets : Telescope :: Repairing a watch : .....

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73. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Cinema : Persistence :: Rainbow : .....

Watch Video Solution

74. Considering the correlation between the word of the first pair , pair of third word accordingly with proper answer OR write the correlated answer:

Torch : Concave lens :: Camera : .....

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75. Name the following :

Name the lens which forms a real image or a

virtual image depending on the position of the object.

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76. Name the following :

Name the lens which produces magnification always less than 1.

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77. Name the following :

Name the lens which always forms an image virtual and smaller than the object.

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78. Name the following :

Name the lens used to obtain the image on a screen.

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79. Name the following :

Name the lens for which the image always lies between the object and the lens.

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80. Name the following :

Name the instrument used to observe bacteria.

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81. Name the following :

Name the instrument used to observe planets

.

Watch Video Solution

82. Answer the following questions :

What is lens ?

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83. Answer the following questions :

In which instruments have you seen a lens ?

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84. Answer the following questions :

How is a lens different from a mirror ?

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85. Answer the following questions :

Make a list of optical devices you know .

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86. Answer the following questions :

Do you know which is the natural optical device ?

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87. Answer the following questions :

What is convex lens ?

Watch Video Solution

88. Answer the following questions :

What is concave lens ?

Watch Video Solution

89. Answer the following questions :

Draw neat labelled diagrams : Types of lenses.

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90. Answer the following questions :

In general, when a ray of light passes through a lens , there occurs a change in its direction of propagation . Why?

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91. Answer the following questions :

With reference to spherical lenses , state the meaning of the following terms or define the following terms and draw the diagrams to illustrate the same: Centre of curvature (C)

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92. Answer the following questions :

With reference to spherical lenses , state the meaning of the following terms or define the following terms and draw the diagrams to

illustrate the same: radii of curvature (R_1, R_2)

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93. Answer the following questions :

With reference to spherical lenses , state the meaning of the following terms or define the following terms and draw the diagrams to illustrate the same: principal axis

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94. Answer the following questions :

With reference to spherical lenses , state the meaning of the following terms or define the following terms and draw the diagrams to illustrate the same: optical centre (O)

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95. Answer the following questions :

With reference to spherical lenses , state the meaning of the following terms or define the

following terms and draw the diagrams to illustrate the same: principal focus (F)

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96. Answer the following questions :

With reference to spherical lenses , state the meaning of the following terms or define the following terms and draw the diagrams to illustrate the same: focal length (f)

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97. Answer the following questions :

Draw a figure explaining various terms related to a lens.

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98. Answer the following questions :

State the rules used for drawing ray diagrams for the formation of an image by a convex lens.

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99. Answer the following questions :

Write any two rules used for drawing ray diagrams for the formation of an image by a convex lens.

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100. Answer the following questions :

In the case of a convex lens , show the path of the refracted ray when the incident ray of light is parallel to the principal axis of the lens

passes through the focus of the lens

passes through the optical centre of the lens.

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101. Answer the following questions :

At which position will you keep an object in front of a convex lens to get a real image smaller than the object ? Draw a figure.

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102. Answer the following questions :

At which position will you keep an object in front of a convex lens so as to get a real image of the same size as the object ? Draw a figure.

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103. Answer the following questions :

State the rules used for drawing ray diagrams for the formation of an image by a concave lens.

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104. Answer the following questions :

State the characteristics of an image formed by a concave lens.

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105. Answer the following questions :

In the case of image formation by a concave lens, what you can say about the position ,

nature and size of the image relative to the size of the object ?

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106. Answer the following questions :

Draw a ray diagram to show image formation by a concave lens .

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107. Answer the following questions :

State the cartesian sign convention for refraction of light (image formation) by a lens .

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108. Answer the following questions :

What is a lens formula ?

state it.

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109. Answer the following questions :

What is meant by the magnification produced by a lens ? State the formulae for it .

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110. Answer the following questions :

When is the magnification produced by a lens

positive

negative ?

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111. Answer the following questions :

Express the magnification produced by a lens in terms of the focal length of the lens and

the object distance

the image distance.

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112. Answer the following questions :

An object is kept in front of a lens of focal

length +10 cm . Describe the nature of the image in the following casses :

the object distance in 25 cm

the object distance in 5 cm.

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113. Answer the following questions :

Anu and anand have concave and convex lenses respectively . They took lenses in sunlight and tried to burn two pieces of paper of equal areas and temperature . State which

lens will burn the paper. Give the reason . Explain with the help of diagram, why the other paper did not burn.

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114. Answer the following questions :

To obtain a magnified real image of a small film strip, which type of lens is used? Where is the film strip placed to obtain the image on the screen?

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115. Answer the following questions :

When an object of height 2 cm is placed in front of a convex lens, the height of the image is found to be 3cm . State the nature and position of the image giving reason .

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116. Answer the following questions :

You are given a lens which gives a virtual, erect and enlarged image . What type of lens is it ?

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117. Answer the following questions :

When an object of height 3 cm is placed in front of a concave lens , the height of the image is found to be 6 cm. State , giving the reason , whether the given statement is true or false .

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118. Answer the following questions :

State two uses of a concave lens.

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119. Answer the following questions :

State two uses of a convex lens.

Watch Video Solution

120. Answer the following questions :

An object is kept in front of a lens of focal length -20 cm . Describe the nature of the image when the object distance is 25 cm.

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121. Answer the following questions :

An object is placed in front of a convex lens of focal length 20 cm. If the object distance is changed from 60 cm to 40 cm , what can you

say about the size of the image relative to that of the object?

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122. Answer the following questions :

What is the power of a lens ?

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123. Answer the following questions :

What is the unit of power of a lens ? Define it .

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124. Answer the following questions :

What is the sign of the power of

a convex lens

a concave lens ?

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125. Answer the following questions :

If there is an increase or decrease in the focal

length of a lens, what will be the effect on the power of the lens ?

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126. Answer the following questions :

If two lenses of focal length f_1 and f_2 are kept in contact with each other , state the formula for the focal length of the combination . If p_1 and P_2 are the power of these lenses, state the formula for the power of the combination .

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127. Answer the following questions :

Draw a neat labelled diagram to show the structure of the human eye.

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128. Answer the following questions :

What is cornea ?

Watch Video Solution

129. Answer the following questions :

What is iris ?

Watch Video Solution

130. Answer the following questions :

What is pupil ?

Watch Video Solution

131. Answer the following questions :

What is the use of the pupil in the human eye ?

Watch Video Solution

132. Answer the following questions :

With reference to the functioning of the pupil in the human eye . what is power of accomodation ?

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133. Answer the following questions :

What is the shape and the size of the human eyeball?

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134. Answer the following questions :

Name the part of the human eye that forms a transparent bulge on the surface of the eyeball.

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135. Answer the following questions :

Which part of the human eye is located just behind the pupil ?

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136. Answer the following questions :

What is retina ?

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137. Answer the following questions :

What is the nature of the eye lens and what does the eye lens do?

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138. Answer the following questions :

What happens when light falls on the retina ?

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139. Answer the following questions :

What are ciliary muscles ?

Watch Video Solution

140. Answer the following questions :

What is the focal length of the eye lens of a normal eye in relaxed position of eye muscles ?

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141. Answer the following questions :

Where does the second focal length of the eye lens of a normal eye in relaxed position of eye muscles lie ?

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142. Answer the following questions :

What is meant by power of accommodation of the eye ?

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143. Answer the following questions :

Define power of accommodation of the eye ?

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144. Answer the following questions :

Explain the term power of accommodation of the eye .

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145. Answer the following questions :

Write a short note on the power of accommodation of the eye .

Watch Video Solution

146. Answer the following questions :

What is meant by accommodation power ? How is it brought about ?

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147. Answer the following questions :

What is the function of thr iris and the muscles connected to the lens in the human eye ?

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148. Answer the following questions :

Have you seen a photographic camera in which a film is used ? Compare the human eye with it . State similarities between them. State the points of difference between them.

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149. Answer the following questions :

Draw a scientifically correct labelled diagram of the human eye and answer the question based on it : Name the type of lens in the human eye.

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150. Answer the following questions :

Draw a scientifically correct labelled diagram of the human eye and answer the question based on it : Name the screen at which the maximum amount of incident light is refracted.

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151. Answer the following questions :

Draw a scientifically correct labelled diagram

of the human eye and answer the question based on it : State the nature of the image formed of the object on the screen inside the eye .

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152. Answer the following questions :

What is meant by the minimum distance of distinct vision ?

Watch Video Solution

153. Answer the following questions :

Explain the term minimum distance of distinct vision .

Watch Video Solution

154. Answer the following questions :

Write a short note on distance of distinct vision .

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155. Answer the following questions :

State four reasons related to problems of vision .

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156. Answer the following questions :

What is myopia or nearsightedness ? What are the possible reasons of myopia ? How is myopia corrected ? Explain with diagrams .

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157. Answer the following questions :

Observe the following diagram and answer the question .

Which eye defect is shown in this diagram ?

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158. Answer the following questions :

Observe the following diagram and answer the question .

What are the possible reasons for this eye defect ?

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159. Answer the following questions :

Observe the following diagram and answer the question .

How is this defect corrected ? Write it in brief .

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160. Answer the following questions :

What is the sign of the power of the lens used

to correct myopia?

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161. Answer the following questions :

In a std. X Class , out of 40 students , 10 students use spectacles, 2 students have posotive power and 8 students have negative power of lenses in their spectacles. Answer the following question :

What does the negative power indicate ?

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162. Answer the following questions :

In a std. X Class , out of 40 students , 10 students use spectacles, 2 students have posotive power and 8 students have negative power of lenses in their spectacles. Answerthe following question :

What does the positive power indicate ?

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163. Answer the following questions :

In a std. X Class , out of 40 students , 10 students use spectacles, 2 students have posotive power and 8 students have negative power of lenses in their spectacles. Answerthe following question :

Generally Which type of spectacles do most of the students use ?

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164. Answer the following questions :

In a std. X Class , out of 40 students , 10 students use spectacles, 2 students have posotive power and 8 students have negative power of lenses in their spectacles. Answerthe following question :

What defect of eyesight do most of the students suffer from?

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165. Answer the following questions :

In a std. X Class , out of 40 students , 10 students use spectacles, 2 students have posotive power and 8 students have negative power of lenses in their spectacles. Answerthe following question :

Give two possible reasons for the above defect in 8 students?

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166. Answer the following questions :

What is hypermetropia or farsightedness? What are the possible reasons of hypermetropia? How is hypermetropia corrected? Explain with figures .

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167. Answer the following questions :

What is the sign of the power of the lens used to correct hypermetropia?

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168. Answer the following questions :

Given below is a diagram showing a defect of human eye :

Name the defect shown in the figure .

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169. Answer the following questions :

Given below is a diagram showing a defect of human eye :

Give two possible reasons for this defect of eye in human beings

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170. Answer the following questions :

Given below is a diagram showing a defect of human eye :

Name the type of lens used to correct the eye defect .

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171. Answer the following questions :

What is presbyopia ? State the reason for this defect . How is presbyopia corrected?

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172. Answer the following questions :

What is a bifocal lens ?

Watch Video Solution

173. Answer the following questions :

Anil cannot see the blackboard writing clearly ,

but he can see near by objects clearly .

What is the eye defect he is suffering from ?

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174. Answer the following questions :

Anil cannot see the blackboard writing clearly ,

but he can see near by objects clearly .

How is it corrected ?

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175. Answer the following questions :

Anil uncle cannot see nearby objects clearly , but he can see distant objects clearly .

What is the eye defect he is suffering from ?

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176. Answer the following questions :

Anil uncle cannot see nearby objects clearly ,

but he can see distant objects clearly .

How is it corrected ?

Watch Video Solution

177. Answer the following questions :

When are bifocal lenses used in spectacles ?

Watch Video Solution

178. Answer the following questions :

Aniket from Std. X uses spectacles .

The power of the lenses in his spectacles is -0.5 D. Answer the following question :

State the type of lenses used in his spectacles.

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179. Answer the following questions :

Aniket from Std. X uses spectacles .

The power of the lenses in his spectacles is -0.5 D. Answer the following question :

Name the defect of vision Aniket is suffering from .

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180. Answer the following questions :

Aniket from Std. X uses spectacles .

The power of the lenses in his spectacles is -0.5 D. Answer the following question :

Find the focal length of the lenses used in his spectacles.

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181. Answer the following questions :

Sunita from Std. X uses spectacles .

Her spectacle number is -1.5 D. Answer the following question :

Name the defect of eye from which she is suffering .

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182. Answer the following questions :

Sunita from Std. X uses spectacles .

Her spectacle number is -1.5 D. Answer the following question :

What type of lens is she using ?

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183. Answer the following questions :

Sunita from Std. X uses spectacles .

Her spectacle number is -1.5 D. Answer the following question :

Find the focal length of the lens .

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184. Answer the following questions :

Surbhi from Std. X uses spectacles .

The power of the lenses in her spectacle is 0.5 D. Answer the following question from the given information :

Identify the type of lenses used in her spectacles.

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185. Answer the following questions :

Surbhi from Std. X uses spectacles .

The power of the lenses in her spectacle is 0.5 D. Answer the following question from the given information :

Identify the defect of vision surabhi is suffering from .

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186. Answer the following questions :

Surbhi from Std. X uses spectacles .

The power of the lenses in her spectacle is 0.5 D. Answer the following question from the given information :

Find the focal length of the lenses used in her spectacles.

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187. Answer the following questions :

My grandfather uses a bifocal lens in his spectacles . Explain why .

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188. Answer the following questions :

State uses of a concave lens .

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189. Answer the following questions :

State uses of a convex lens .

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190. Answer the following questions :

What is meant by the apparent size of an object ? With a neat and labelled diagram , explain the relation between the apparent size of an object and the angle subtended by the object at the eye .

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191. Answer the following questions :

With a neat labelled diagram , explain the working of a simple microscope . State uses of a simple microscope.

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192. Answer the following questions :

What does a simple microscope consist of ? What is the order of magnification obtained

by a simple microscope ? What is a simple microscope used for ?

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193. Answer the following questions :

With a neat labelled diagram , explain the construction and working of a compound microscope .

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194. Answer the following questions :

State two uses of a compound microscope .

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195. Answer the following questions :

In which type of microscope do you find the lens arrangement as shown in the following diagram ?

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196. Answer the following questions :

Write and brief , the working of this microscope .

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197. Answer the following questions :

Where is this microscope used ?

Watch Video Solution

198. Answer the following questions :

Observe the following figure and answer the questions : In which type of microscope do you find the lenses arrangement as shown in the following figure ?

Watch Video Solution

199. Answer the following questions :

Observe the following figure and answer the

questions :Write and brief , the working of this microscope .

Watch Video Solution

200. Answer the following questions :

Observe the following figure and answer the questions How can we get different magnifications in this optical instrument ?

Watch Video Solution

201. Answer the following questions :

With a neat labelled diagram , explain the working of a refracting telescope .

Watch Video Solution

202. Answer the following questions :

Explain the working of an astronomical telescope using refraction of light .

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203. Answer the following questions :

State the use of a telescope .

Watch Video Solution

204. Answer the following questions :

Observe the following figure and answer the questions : Which optical instrument shows arrangement of lenses as shown in the figure ?

Watch Video Solution

205. Answer the following questions :

Observe the following figure and answer the questions :Write and brief , the working of this optical instrument.

Watch Video Solution

206. Answer the following questions :

Observe the following figure and answer the questions : How can we get different magnifications in this optical instrument ?

Watch Video Solution

207. Answer the following questions :

What is the persistence of vision ? Give one example of persistence of vision .

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208. Answer the following questions :

Name two devices whose working is based on the phenomenon of persistance of vision .

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209. Answer the following questions :

Name any two applications based on persistence of vision .

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210. Answer the following questions :

How is the phenomenon of persistance of vision used in motion pictures ?

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211. Answer the following questions :

Name the two types of light sensitive cells present in the retina of the human eye . What are their functions ?

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212. Answer the following questions :

When do you say that a person iscolour blind ?

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213. Answer the following questions :

Explain the perception of colour in the human eye .

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214. Answer the following questions :

Explain in short perception of colour .

Watch Video Solution

215. Answer the following questions :

Write a note on perception of colour .

Watch Video Solution

216. What is colour blindness?

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217. Answer the following questions :

What are some persons colour- blind? What is

the cause of this defect?

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218. Answer the following questions :

What are the difficulties faced by a colour blind person?

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219. Give scientific reasons :

A convex lens is known as a converging lens.

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220. Give scientific reasons :

A concave lens is known as a diverging lens.

Watch Video Solution

221. Give scientific reasons:

Simple microscope is used for watch repair

Watch Video Solution

222. Give scientific reasons :

Watch repairers use a magnifying glass.

Watch Video Solution

223. Give scientific reasons :

In old age, a bifocal lens is necessary for some persons .

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224. Give scientific reasons :

A person suffering from myopia (nearsightedness) uses spectacles of concave lenses .

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225. Give scientific reasons :

A person suffering from hypermetropia (farsightedness) uses spectacles of convex lenses .

Watch Video Solution

226. Give scientific reasons :

You cannot enjoy watching a movie from a very short distance from the screen in a cinema hall .

Watch Video Solution

227. Give scientific reasons :

We cannot clearly see an object kept at a distance less than 25 cm from the eye .

Watch Video Solution

228. Give scientific reasons :

One can sense colours only in bright light .

Watch Video Solution

229. Give scientific reasons :

The rays of light travelling through the optical centre of a lens pass without changing their path .

Watch Video Solution

230. Give scientific reasons :

A convex lens converges the rays of light falling on it .

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231. Give scientific reasons :

A concave lens diverges the rays of light falling on it .

Watch Video Solution

232. Give scientific reasons :

When a burning stick of incense is moved fast in a circle , a circle of red light is seen.

Watch Video Solution

233. Give scientific reasons :

Colour- blind persons are unable to distinguish between different colours .

Watch Video Solution

234. Give scientific reasons :

It is risky to issue a driving license to a person suffering from colour- blindness.

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235. Distinguish between the following :

Real image and virtual image.

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236. Distinguish between the following :

Concave lens and convex lens .

Watch Video Solution

237. Distinguish between the following :

farsightedness (hypermetropia) and nearsightedness (myopia).

Watch Video Solution

238. Distinguish between the following :

Simple microscope and compound microscope.

Watch Video Solution

239. Distinguish between the following :

compound microscope and astronomical microscope .

Watch Video Solution

240. Distinguish between the following :

Simple microscope and Astronomical microscope.

Watch Video Solution

241. Read the following paragraph and answer the following questions given below it :

Construction of a compound microscope :

(i) Acompound microscope consists of a metal tube fitted with two convex lenses at the two ends. These lenses are called the objective lens

(the lens directed towards the object) and the eyepiece (the lens directed towards the eye). Both the lenses are small in size , but the cross section of the objective lens has a short focal length . the focal length of the eyepiece is more than that of the objective lens .

(ii) The metal tube is mounted on a stand . thr principal axes of the objective lens and the eyepiece are along the same line . The distance between the object and objective lens can be changed with a screw . It is possible to change the distance between the objective lens and the eyepiece.

Working :

(i) The object to be observed is illuminated and placed in front of the objective lens. slightly beyond the focal length of the objective lens. it's real , inverted and enlarged image is formed by the objective lens on the other side.

(ii) This intermediate image lies with in the focal length of the eyepiece. It serves as an object for the eyepiece. The eyepiece works as a simple microscope . the final image is virtual, highly enlarged and inverted with respect to the original object . It can be formed at the

minimum distance of distinct vision from the eyepiece . The final image is observed by keeping the eye close to the eyepiece.

Use: This microscope is used to observe blood cells , microorganisms , etc.

In a compound microscope , which lens has greater focal length ?

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242. Read the following paragraph and answer the following questions given below it :

Construction of a compound microscope :

(i) Acompound microscope consists of a metal tube fitted with two convex lenses at the two ends. These lenses are called the objective lens (the lens directed towards the object) and the eyepiece (the lens directed towards the eye). Both the lenses are small in size , but the cross section of the objective lens has a short focal length . the focal length of the eyepiece is more than that of the objective lens .

(ii) The metal tube is mounted on a stand . thr principal axes of the objective lens and the eyepiece are along the same line . The distance

between the object and objective lens can be changed with a screw . It is possible to change the distance between the objective lens and the eyepiece.

Working :

(i) The object to be observed is illuminated and placed in front of the objective lens. slightly beyond the focal length of the objective lens. it's real , inverted and enlarged image is formed by the objective lens on the other side.

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object for the eyepiece. The eyepiece works as a simple microscope . the final image is virtual, highly enlarged and inverted with respect to the original object . It can be formed at the minimum distance of distinct vision from the eyepiece . The final image is observed by keeping the eye close to the eyepiece.

Use: This microscope is used to observe blood cells , microorganisms , etc.

Where do you place the object to be observed with a compound microscope ?

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243. Read the following paragraph and answer the following questions given below it :

Construction of a compound microscope :

(i) Acompound microscope consists of a metal tube fitted with two convex lenses at the two ends. These lenses are called the objective lens (the lens directed towards the object) and the eyepiece (the lens directed towards the eye). Both the lenses are small in size , but the cross section of the objective lens has a short focal length . the focal length of the eyepiece is more than that of the objective lens .

(ii) The metal tube is mounted on a stand . thr principal axes of the objective lens and the eyepiece are along the same line . The distance between the object and objective lens can be changed with a screw . It is possible to change the distance between the objective lens and the eyepiece.

Working :

(i) The object to be observed is illuminated and placed in front of the objective lens. slightly beyond the focal length of the objective lens. it's real , inverted and enlarged image is formed by the objective lens on the

other side.

(ii) This intermediate image lies with in the focal length of the eyepiece. It serves as an object for the eyepiece. The eyepiece works as a simple microscope . the final image is virtual, highly enlarged and inverted with respect to the original object . It can be formed at the minimum distance of distinct vision from the eyepiece . The final image is observed by keeping the eye close to the eyepiece.

Use: This microscope is used to observe blood cells , microorganisms , etc.

State which distance is adjusted to observe the object with a compound microscope ?

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244. Read the following paragraph and answer the following questions given below it :

Construction of a compound microscope :

(i) Acompound microscope consists of a metal tube fitted with two convex lenses at the two ends. These lenses are called the objective lens (the lens directed towards the object) and

the eyepiece (the lens directed towards the eye). Both the lenses are small in size , but the cross section of the objective lens has a short focal length . the focal length of the eyepiece is more than that of the objective lens .

(ii) The metal tube is mounted on a stand . thr principal axes of the objective lens and the eyepiece are along the same line . The distance between the object and objective lens can be changed with a screw . It is possible to change the distance between the objective lens and the eyepiece.

Working :

(i) The object to be observed is illuminated and placed in front of the objective lens. slightly beyond the focal length of the objective lens. it's real , inverted and enlarged image is formed by the objective lens on the other side.

(ii) This intermediate image lies with in the focal length of the eyepiece. It serves as an object for the eyepiece. The eyepiece works as a simple microscope . the final image is virtual, highly enlarged and inverted with respect to the original object . It can be formed at the minimum distance of distinct vision from the

eyepiece . The final image is observed by keeping the eye close to the eyepiece.

Use: This microscope is used to observe blood cells , microorganisms , etc.

State the nature of the final image in a compound microscope relative to the object ?

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245. Read the following paragraph and answer the following questions given below it :

Construction of a compound microscope :

(i) Acompound microscope consists of a metal tube fitted with two convex lenses at the two ends. These lenses are called the objective lens (the lens directed towards the object) and the eyepiece (the lens directed towards the eye). Both the lenses are small in size , but the cross section of the objective lens has a short focal length . the focal length of the eyepiece is more than that of the objective lens .

(ii) The metal tube is mounted on a stand . thr principal axes of the objective lens and the eyepiece are along the same line . The distance between the object and objective lens can be

changed with a screw . It is possible to change the distance between the objective lens and the eyepiece.

Working :

(i) The object to be observed is illuminated and placed in front of the objective lens. slightly beyond the focal length of the objective lens. it's real , inverted and enlarged image is formed by the objective lens on the other side.

(ii) This intermediate image lies with in the focal length of the eyepiece. It serves as an object for the eyepiece. The eyepiece works as

a simple microscope . the final image is virtual, highly enlarged and inverted with respect to the original object . It can be formed at the minimum distance of distinct vision from the eyepiece . The final image is observed by keeping the eye close to the eyepiece.

Use: This microscope is used to observe blood cells , microorganisms , etc.

State the use of a compound microscope ?

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246. Solve the following examples/ numerical problems: < br > An object is kept at 60 cm in front of a convex lens. Its real image is formed at 20 cm from the lens . Find the focal length of the lens.

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247. Solve the following examples/ numerical problems: < br > The focal length of a convex lens is 20 cm . If an object of height 2cm is

placed at 30 cm from the lens , find

(i) the position and nature of the image

(ii) the height of the image

(iii) the magnification produced by the lens .

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248. Solve the following examples/ numerical problems:

When a pin of height 3 cm is fixed at 10 cm from a convex lens , the height of the virtual

image formed is 12 cm . Find the focal length of the lens.

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249. Solve the following examples/ numerical problems: < br > At what distance from a convex lens of focal length 2.5 m should a boy stand so that his image is half is height ?

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250. Solve the following examples/ numerical problems: < br > Aconvex lens forms a real image of a pencil at a distance of 40 cm from the lens . The image is formed is of the same size as the object . Find the focal length and power of the lens . At what distance is the pencil placed from the lens ?

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251. Solve the following examples/ numerical problems: < br > A spherical lens is used to obtain an image on a screen . The size of the image is four times the size of the object. What is the type of lens and at what distance is the screen placed from the lens ?

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252. Solve the following examples/ numerical problems:

An object of height 5cm is held 20 cm away from a converging lens of focal length 10 cm. Find the position , nature and size of the image formed.

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253. Solve the following examples/ numerical problems:

An object is placed at 10 cm from a convex lens of focal length 12 cm . Find the nature and position of the image .

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254. Solve the following examples/ numerical problems:

5 cm high object is placed at a distance of 25 cm from a converging lens of focal length of 10 cm .Determine the position , size and type of the image.

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255. Doctor has prescribed a lens having power +1.5D. What will be the focal length of the lens? What is the type of the lens and what must be the defect of vision?

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256. Solve the following examples/ numerical problems:

An object of height 4cm is placed in front of a concave lens of focal length 40 cm. If the

object distance is 60 cm, Find the position and height of the image .

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257. An object is kept 60 cm from a lens gives a virtual image 20 cm in front of the lens. What is the focal length of the lens? Is is a converging lens or diverging lens?

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258. Solve the following examples/ numerical problems: < br > What is the power of a convex lens having focal length 0.5 m ?

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259. Solve the following examples/ numerical problems:

The power of a convex lens is 2.5 dioptres. Find its focal length .

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260. Calculate the focal length of a corrective lens having power`+2.5D.

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261. Solve the following examples/ numerical problems:

Calculate the focal length of a corrective lens having power + 2 D.

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262. Three lenses having power 2, 2.5 and 1.7 D are kept touching in a row. What is the total power of the lens combination?

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263. Solve the following examples/ numerical problems:

Two convex lenses of focal length 20 cm each are kept in contact with each other . Find the power of their combination .

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264. Solve the following examples/ numerical problems:

Two convex lenses of equal focal length are kept in contact with each other . If the power of their combination is 20 D, find the focal length of each convex lens .

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265. Solve the following examples/ numerical problems: < br > If a convex lens of a focal length 10 cm and a concave lens of focal length 50 cm are kept in contact with each other .(i) What will be the focal length of the combination ? (ii) what will be the power of the combination ? (iii) what will be the behaviour of the combination (behaviour as a convex lens /concave lens)?

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266. Find the focal length of a convex lens which produces a real image at 60 cm from the lens when an object is placed at 40 cm in front of the lens .

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267. Find the focal length of a convex lens which produces a virtual image at 10 cm from the lens when an object is placed at 5 cm from the lens .

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268. A real image is obtained at 30 cm from a convex lens of focal length 7.5 cm .Find the distance of the object from tne lens .

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269. An object is kept at 20 cm in front of a convex lens its real image is formed at 60 cm from the lens. Find

(i) the focal length of the lens

(ii) the height of the image if the height of the object is 6 cm.

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270. An object is kept at 10 cm in front of a convex lens . Its image is formed on the screen at 15 cm from the lens. Calculate

(i) the focal length of the lens

(ii) the magnification produced by the lens.

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271. An object is kept at 60 cm in front of a convex lens of focal length 15 cm . Find the image distance and the nature of the image . Also find the magnification produced by the lens.

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272. An object of height 2 cm is kept at 30 cm from a convex lens . Its real image is formed at 60 cm from the lens .Find the focal length and power of the lens.

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273. If the power of a lens is 4 dioptres , find its focal length.

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274. Find the power of a convex lens of focal length 40 cm.

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275. Find the power of a convex lens of focal length 12.5 cm.

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276. If for a lens , f= -20 cm, what is the power of the lens ?

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277. An object of height 4 cm is kept in front of a concave lens of focal length 20 cm. If the object distance is 30 cm, find the position and the height of the image .

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278. If two convex lenses of focal lengths 10 cm and 5 cm are kept in contact with each other , What is their combined focal length ?

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279. If a convex lens of focal length 20 cm and a concave lens of focal length 30 cm are kept in contact with each other .

(i) What will be the focal length of the combination ?

(ii) What will be the power of the combination ?

(iii) What will be the behaviour of the combination ?

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280. If a concave lens of focal length 12 cm and a convex lens of focal length 20 cm are kept in contact with each other .

(i) Find be the focal length of the combination ?

(ii) What will be the behaviour of the combination ?

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