PHYSICS

BOOKS - MODERN PUBLICATION

UNIT TEST -06

EXAMPLE

1. 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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2. 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.

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3. (a) and (b) show refraction of a ray in incident at 60° with the normal to a glass-air interface respectively.Predict the angle of refraction in glass when the angle of incidence in water is 45° with the normal to a water-glass interface[Fig.6.01(c)].

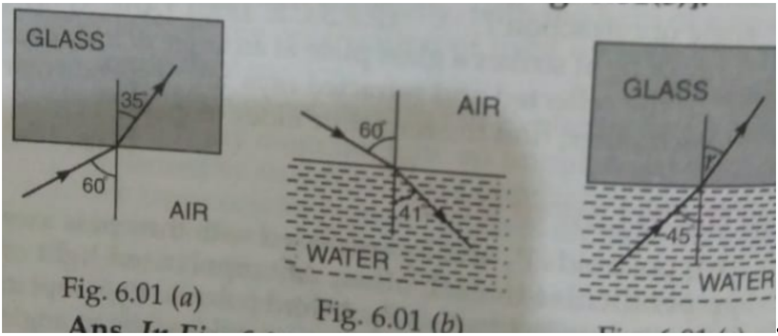

Fig. 6.01 (a)
Fig. 6.01 (b)

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4. A small bulb is placed at the bottom of a tank containing water to a depth of 80cm. What is the area of the surface of water through which light from the bulb can emerge out? Refractive index of water is 1.33. (Consider the bulb to be a point source.)

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5. A prism is made of glass of unknown refractive index. A parallel beam of light is incident on a face of the prism. The angle of minimum deviation is measured to be 40°. What is the refractive index of the material of the prism? The refracting angle of the prism is 60°. If the prism is placed in water (refractive index 1.33), predict the new angle of minimum deviation of a parallel beam of light.

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6. Double-convex lenses are to be manufactured from a glass of refractive index 1.55, with both faces of the same radius of curvature. What is the radius of curvature required if the focal length is to be 20cm?

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7. A beam of light converges at a point P. Now a lens is placed in the path of the convergent beam 12cm from P. At what point does the beam converge if the lens is: a convex lens of focal length 20cm?

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8. A beam of light converges at a point P. Now a lens is placed in the path of the convergent beam 12cm from P. At what point does thebeam converge if the lens is: a concave lens of focal length 16cm?

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9. An object of size 3.0cm is placed 14cm in front of a concave lens of focal length 21cm. Describe the image produced by the lens. What happens if the object is moved further away from the lens?

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10. What is the focal length of a combination of two concave lenses both of focal length 20 cm ?Is the system,a converging or a diverging lens?Ignore thickness of the lenses.

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11. A compound microscope consists of an objective lens of focal length 2.0 cm and an eyepiece of focal length 6.25 cm separated by a distance of 15 cm. How far from the objective should an object be placed in order to obtain the final image at the least distance of distinct vision (25 cm)? What is the magnifying power of the microscope in?

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12. A compound microscope consists of an objective lens of focal length 2.0 cm and an eyepiece of focal length 6.25 cm separated by a distance of 15 cm. How far from the objective should an object be placed in order to obtain the final image at the least distance of distinct vision (25 cm)? What is the magnifying power of the microscope in?

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13. A person with a normal near point (25 cm) using a compound microscope with objective of focal length 8.0 mm and an eyepiece of focal length 2.5cm can bring an object placed at 9.0mm from the objective in sharp focus. What is the separation between the two lenses? Calculate the magnifying power of the microscope.

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14. A small telescope has an objective lens of focal length 144cm and an eyepiece of focal length 6.0cm. What is the magnifying power of the telescope? What is the separation between the objective and the eyepiece?

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15. A giant refracting telescope at an observatory has an objective lens of focal length 15m. If an eyepiece of focal length 1.0cm is used, what is the angular magnification of the telescope?

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16. A telescope has objective lens of focal length 15m. If this telescope is used to view the moon, what is the diameter of the image of the moon formed by the objective lens? The diameter of the moon is $3.48 \times 10^6 m$, and the radius of lunar orbit is $3.8 \times 10^8 m$.

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17. Use the mirror equation to deduce that: an object placed between f and 2f of a concave mirror produces a real image beyond 2f.

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18. Use the mirror equation to deduce that: a convex mirror always produces a virtual image independent of the location of the object.

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19. Use the mirror equation to deduce that: the virtual image produced by a convex mirror is always diminished in size and is located between the focus and the pole.

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20. Use the mirror equation to deduce that: an object placed between the pole and focus of a concave mirror produces a virtual and enlarged image.

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21. A small pin fixed on a table top is viewed from above from a distance of 50cm. By what distance would the pin appear to be raised if it is viewed from the same point through a 15cm thick glass slab held parallel to the table? Refractive index of glass = 1.5. Does the answer depend on the location of the slab?

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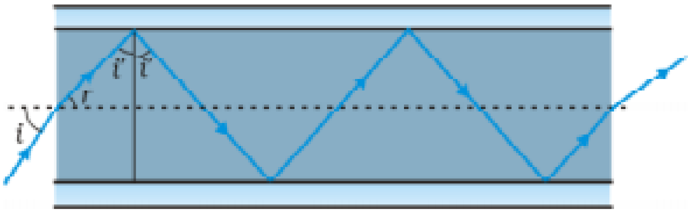
22. Figure 9.35 shows a cross-section of a glass fibre of refractive index 1.68. The outer covering of the pipe is made of a material of refractive index 1.44. What is the range of the angles of the incident rays with the axis of the pipe for which total reflections inside the pipe take place, as shown in the figure. :



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23. Answer the following questions: You have learnt that plane and convex mirrors produce virtual images of objects. Can they produce real images under some circumstances? Explain.

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24. Answer the following questions: A virtual image, we always say, cannot be caught on a screen.Yet when we on to the contradiction?

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25. Answer the following questions: A diver under water, looks obliquely at a fisherman standing on the bank of a lake. Would the fisherman look taller or shorter tothe diver than what he actually is?

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26. Answer the following questions: Does the apparent depth of a tank of water change if viewed obliquely? If so, does the apparent depth increase or decrease?

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27. Answer the following questions: The refractive index of diamond is much greater than that of ordinary glass. Is this fact of some use to a diamond cutter?

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28. The image of a small electric bulb fixed on the wall of a room is to be obtained on the opposite wall 3m away by means of a large convex lens. What is the maximum possible focal length of the lens required for the purpose?

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29. A screen is placed 90cm from an object. The image of the object on the screen is formed by a convex lens at two different locations separated by 20cm. Determine the focal length of the lens.

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30. Determine the 'effective focal length' of the combination of the two lenses convex lens of focal length 30cm in contact with a concave lens of focal length 20cm, if they are placed 8.0 cm apart with their principal axes coincident. Does the answer depend on which side of the combination a beam of parallel light is incident? Is the notion of effective focal length of this system useful at all?

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31. Two lenses convex lens of focal length 30 cm in contact with a concave lens of focal length 20 cm, if they are placed 8.0 cm apart with their principal axes coincident. An object 1.5 cm in size is placed on the side of the convex lens. The distance between the object and the convex lens is 40 cm. Determine the magnification produced by the two-lens system, and the size of the image.

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32. At what angle should a ray of light be incident on the face of a prism of refracting angle 60° so that it just suffers total internal reflection at the other face? The refractive index of the material of the prism is 1.524.

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33. You are given prisms made of crown glass and flint glass with a wide variety of angles. Suggest a combination of prisms which willdeviate a pencil of white light without much dispersion.

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34. You are given prisms made of crown glass and flint glass with a wide variety of angles. Suggest a combination of prsims which will-disperse (and displace) a pencil of white light without much deviation.

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35. For a normal eye, the far point is at infinity and the near point of distinct vision is about 25cm in front of the eye. The cornea of the eye provides a converging power of about 40 dioptres, and the leas converging power of the eye-lens behind the cornea is about 20 dioptres. From this rough data estimate the range of accommodation (i.e., the range of converging power of the eye-lens) of a normal eye.

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36. Does short-sightedness (myopia) or long-sightedness (hyper metropia) imply necessarily that the eye has partially lost its ability of accommodation? If not, what might cause these defects of vision?

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37. A myopic person has been using spectacles of power -1.0D for distant vision. During old age he also needs to use separate reading glass of power +2.0 dioptres. Explain what may have happened.

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38. A person looking at a person wearing a shirt with a pattern comprising vertical and horizontal lines is able to see the vertical lines more distinctly than the horizontal ones. What is this defect due to? How is such a defect of vision corrected?

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39. A man with normal near point (25 cm) reads a book with small print using a magnifying glass: a thin convex lens of focal length 5 cm- What is the closest and the farthest distance at which he should keep the lens from the page so that he can read the book when viewing through the magnifying glass?

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40. A man with normal near point (25 cm) reads a book with small print using a magnifying glass: a thin convex lens of focal length 5 cm- What is the maximum and the minimum angular magnification (magnifying power) possible using the above simple microscope?

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41. A card sheet divided into squares each of size $1mm^2$ is being viewed at a distance of 9 cm through a magnifying glass (a converging lens focal length 10 cm) held close to the eye. What is the magnification produced by the lens? How much is the area of each square in the virtual image?

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42. A card sheet divided into squares each of size $1mm^2$ is being viewed at a distance of 9 cm through a magnifying glass (a converging lens of focal length 9 cm) held close to the eye. What is the angular magnification (magnifying power) of the lens?

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43. A card sheet divided into squares each of size $1mm^2$ is being viewed at a distance of 9 cm through a magnifying glass (a converging lens of focal length 9 cm) held close to the eye. What is the angular magnification (magnifying power) of the lens?

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44. At what distance should the converging lens of focal length 10 cm be held in order to view the squares distinctly with the maximum possible magnifying power?

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45. At what distance should the converging lens of focal length 10 cm be held in order to view the squares distinctly with the maximum possible magnifying power? What is the magnification in this case?

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46. At what distance should the converging lens of focal length 10 cm be held in order to view the squares distinctly with the maximum possible magnifying power? Is the magnification equal to the magnifying power in this case? Explain.

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47. A card sheet divided into squares each of size $1mm^2$ is being viewed at a distance of 9 cm through a magnifying glass (a converging lens of focal length 10 cm) held close to the eye. What should be the distance between the object in converging lens and the magnifying glass if the virtual image of each square in the figure is to have an area of $6.25 mm^2$. Would you be able to see the squares distinctly with your eyes very close to the magnifier ?

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48. Answer the following questions: The angle subtended at the eye by an object is equal to the angle subtended at the eye by the virtual image produced by a magnifying glass. In what sense then does a magnifying glass provide angular magnification?

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49. Answer the following question: In viewing through a magnifying glass, one usually positions one's eyes very close to the lens. Does angular magnification change if the eye is moved back?

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50. Answer the following questions: Magnifying power of a simple microscope is inversely proportional to the focal length of the lens. What then stops us from using a convex lens of smaller and smaller focal length and achieving greater and greater magnifying power?

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51. Answer the following questions: Why must both the objective and the eyepiece of a compound microscope have short focal lengths?

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52. Answer the following questions: When viewing through a compound microscope, our eyes should be positioned not on the eyepiece but a short distance away from it for best viewing. Why? How much should be that short distance between the eye and eyepiece?

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53. An angular magnification (magnifying power) of 30X is desired using an objective of focal length 1.25cm and an eyepiece of focal length 5cm. How will you set up the compound microscope?

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54. A small telescope has an objective lens of focal length 140cm and an eyepiece of focal length 5.0cm. What is the magnifying power of the telescope for viewing distant objects when- the telescope is in normal adjustment (i.e., when the final image is at infinity)?

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55. A small telescope has an objective lens of focal length 140cm and an eyepiece of focal length 5.0cm. What is the magnifying power of the telescope for viewing distant objects when- the final image is formed at the least distance of distinct vision (25cm)?

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56. A small telescope has an objective lens of focal length 140 cm and an eyepiece of focal length 5.0 cm. (A) what is the separation between the objective lens and the eyepiece? (B) If this telescope is used to view a 100 m tall tower 3 km away, what is the height of the image of the tower formed by the objective lens?

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57. A small telescope has an objective lens of focal length 140 cm and an eyepiece of focal length 5.0 cm. (A) what is the separation between the objective lens and the eyepiece? (B) If this telescope is used to view a 100 m tall tower 3 km away, what is the height of the image of the tower formed by the objective lens?

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58. What is the height of the final image on the tower if it is formed at 25 cm?

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59. A Cassegrain telescope uses two mirrors as shown in Fig. 9.33. Such a telescope is built with the mirrors 20mm apart. If the radius of curvature of the large mirror is 220mm and the small mirror is 140mm, where will the final image of an object at infinity be?

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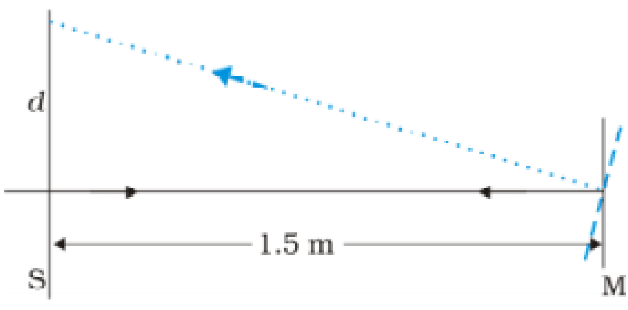
60. Light incident normally on a plane mirror attached to a galvanometer coil retraces backwards as shown in Fig. 9.36. A current in the coilproduces a deflection of 3.5 of the mirror. What is the displacement of the reflected spot of light on a screen placed 1.5 m away?:



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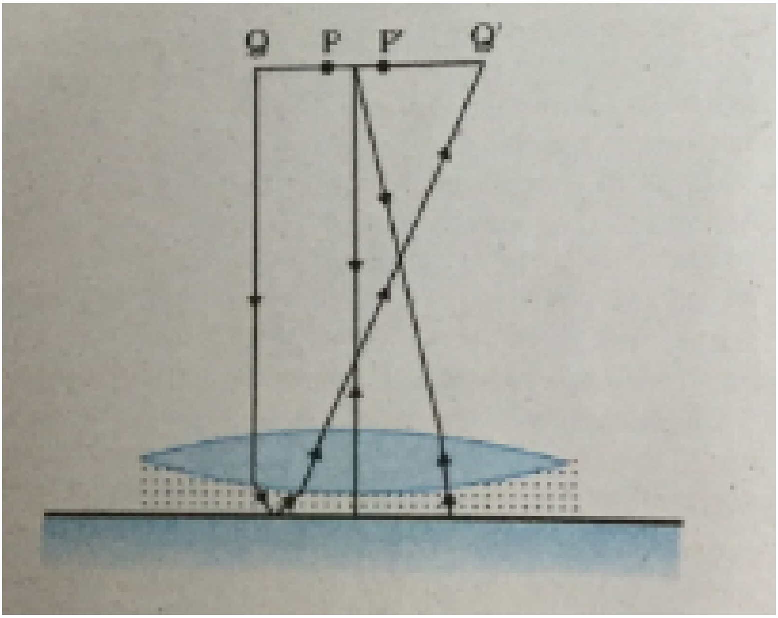
61. The figure TBQ 9.38 shows an equiconvex lens (of refractive index 1.50) in contact with a liquid layer on top of a plane mirror. A small needle with its tip on the principal axis is moved along the axis until its inverted images if found at the positions of hte needle. The distance of the needle from the lens is measured to be 45.0 cm. The new distane is measured to be 30.0 cm. What is the refractive index of the liquid?



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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 (a) reflected and

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63. Monochromatic light of wavelength 589 nm is incident from air on a water surface. What are the wavelength, frequency and speed of (b) refracted light ? (Refracted index of water is 1.33)

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64. What is the shape of the wavefront in each of the following cases:Light diverging from a point source.

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65. What is the shape of the wavefront in each of the following cases: Light emerging out of a convex lens when a point source is placed at its focus.

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66. What is the shape of the wavefront in each of the following cases: The portion of the wavefront of light from a distant star intercepted by the Earth.

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67. The refractive index of glass is 1.5. What is the speed of light in glass? (Speed of light in vacuum is $3.0 \times 10^8 m$s)

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68. Is the speed of light in glass independent of the colour of light? If not, which of the two colours red and violet travels slower in a glass prism?

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69. In a Young's double slit experiment, the slits are separated by 0.03 cm and the screen is placed 1.5 m away. The distance between the central fringe and the fourth bright fringe is 1 cm. Determine the wavelength of light used in the experiment.

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70. In Young wavelength λ, the intensity of light at a point on the screen where path difference is λ, is K units. What is the intensity of light at a point where path difference is $\frac{\lambda}{3}$?

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71. A beam of light consisting of two wavelengths, 650 nm and 520 nm, is used to obtain interference fringes in a Young experiment.- Find the distance of the third bright fringe on the screen from the central maximum for wavelength 650 nm.

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72. A beam of light consisting of two wavelengths, 650 nm and 520 nm,is used to obtain interference fringes in a Young experiment.-What is the least distance from the central maximum where the bright fringes due to both the wavelengths coincide?

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73. In a double-slit experiment the angular width of a fringe is found to be 0.2° on a screen placed 1 m away. The wavelength of light used is 600 nm. What will be the angular width of the fringe if the entire apparatus is immersed in water? Take refractive indexof water to be $\frac{4}{3}$.

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74. What is the Brewster angle for air to glass transition? (Refractive index of glass = 1.5.)

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75. Light of wavelength 5000 Å falls on a plane reflecting surface. What are the wavelength and frequency of the reflected light? For what angle of incidence is the reflected ray normal to the incident ray?

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76. Estimate the distance for which ray optics is good approximation for an aperture of 4 mm and wavelength 400 nm.

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77. The $6563\overset{\circ}{A} H_{\alpha}$ line emitted by hydrogen in a star is found to be red-shifted by $15\overset{\circ}{A}$. Estimate the speed with which the star is recedng from the Earth.

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78. Explain how Corpuscular theory predicts the speed of light in a medium, say, water, to be greater than the speed of light in vacuum. Is the prediction confirmed by experimental determination of the speed of light in water ? If not, which alternative picture of light is consistent with experiment?

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79. You have learnt in the text how Huygens of reflection and refraction. Use the same principle to deduce directly that a point object placed in front of a plane mirror produces a virtual image whose istance from the mirror is equal to the object distance from the mirror.

80. 4 Let us list some of the factors, which could possibly influence the speed of wave propagation:(i) nature of the source.(ii) direction of propagation.(iii) motion of the source and/or observer.(iv) wavelength. (v) intensity of the wave. On which of these factors, if any, does,depend? :the speed of light in vacuum

81. 5 Let us list some of the factors, which could possibly influence the speed of wave propagation: (i) nature of the source (ii) direction of propagation. (iii) motion of the source and/or observer. (iv) wavelength. (v) intensity of the wave. On which of te factors, if any, does,depend?:the speed of light in a medium (say, glass or water)

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82. 4 Let us list some of the factors, which could possibly influence the speed of wave propagation:(i) nature of the source.(ii) direction of propagation.(iii) motion of the source and/or observer.(iv) wavelength. (v) intensity of the wave. On which of these factors, if any, does,depend? :the speed of light in vacuum

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83. 5 Let us list some of the factors, which could possibly influence the speed of wave propagation: (i) nature of the source (ii) direction of propagation. (iii) motion of the source and/or observer. (iv) wavelength. (v) intensity of the wave. On which of te factors, if any, does,depend?:the speed of light in a medium (say, glass or water)

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84. 4 Let us list some of the factors, which could possibly influence the speed of wave propagation:(i) nature of the source.(ii) direction of propagation.(iii) motion of the source and/or observer.(iv) wavelength. (v) intensity of the wave. On which of these factors, if any, does,depend? :the speed of light in vacuum

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85. For sound waves, the Doppler formula for frequency shift differs slightly between the two situations: 1. source at rest, observer moving 2. source moving, observer at rest. The exact Doppler formulas for the case of light waves in vacuum are, however, strictly identical for these situations. Explain why this should be so. Would you expect the formulas to be strictly identical for the two situations in case of light travelling in a medium?

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86. For sound waves, the Doppler formula for frequency shift differs slightly between the two situations: 1. source at rest, observer moving 2. source moving, observer at rest. The exact Doppler formulas for the case of light waves in vacuum are, however, strictly identical for these situations. Explain why this should be so. Would you expect the formulas to be strictly identical for the two situations in case of light travelling in a medium?

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87. In double-slit experiment using light of wavelength 600 nm, the angular width of a fringe formed on a distant screen is 0.1°. What is the spacing between the two slits?

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88. Answer the following questions: In a single slit diffraction experiment, the width of the slit is made double the original width. How does this affect the size and intensity of the central diffraction band?

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89. Answer the following questions: In what way is diffraction from each slit related to the interference pattern in a double-slit experiment?

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90. Answer the following questions: When a tiny circular obstacle is placed in the path of light from a distant source, a bright spot is seen at the centre of the shadow of the obstacle. Explain why?

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91. Answer the following questions: Two students are separated by a 7 m partition wall in a room 10 m high. If both light and sound waves can bend around obstacles, how is it that the students are unable to see each. other even though they can converse easily.

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92. Answer the following questions: Ray optics is based on the assumption that light travels in a straight line. Diffraction effects (observed when light propagates through small apertures/slits or around small obstacles) disprove this assumption. Yet the ray optics assumption is so commonly used in understanding location and several other properties of images in optical instruments. What is the justification?

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93. Two towers on top of two hills are 40 km apart. The line joining them passes 50 m above a hill halfway between the towers. What is the longest wavelength of radio waves, which can be sent between the towers without appreciable diffraction effects?

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94. 9 A parallel beam of light of wavelength 500 nm falls on a narrow slit and the resulting diffraction pattern is observed on a screen 1 m away. It is observed that the first minimum is at a distance of 2.5 mm from the centre of the screen. Find the width of the slit.

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95. When a low flying aircraft passes over head, we sometimes notice slight shaking of the picture on our TV screen. Suggest a possible explanation.

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96. Answer the following questions: As you have learnt in the text, the principle of linear superposition f wave displacement is basic to understanding intensity distributions in diffraction and interference patterns.What is the justification of this principle?

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97. In deriving the single slit diffraction pattern, it was stated that the intensity is zero at angles of $n\frac{\lambda}{a}$. Justify this by uitably dividing the slit to bring out the cancellation.

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98. Will the focal length of a lens for red light be more, same or less than that for blue light?

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99. The near vision of an average person is 25 cm. To view an object with an angular magnification of 10, what should be the power of the microscope?

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100. An unsymmetrical double convex thin lens forms the image of a point object on its axis. Will the position of the image change if the lens is reversed?

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101. In a container having water filled upto a height h, a hole is made in the bottom. The velocity of the water flowing out of the hole is

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102. For a glass prism $(\mu = \sqrt{3})$ the anlge of minimum deviation is equal to the angle of the prism. Find the angle of the prism.

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103. A short linear object of length b lies along the axis of a concave mirror of focal length f at a distance u from the pole. What is the size of the image?

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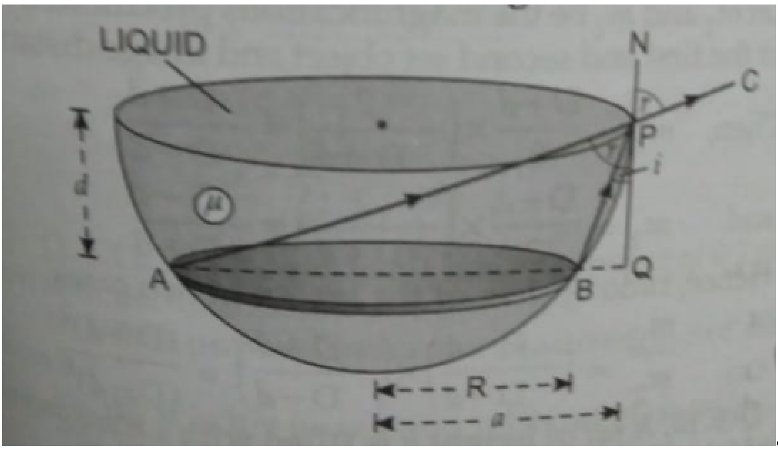
104. A circular disc of radius R is placed co-axically and horizontally inside an opaque hemishperical bowl of radius a as shown in Fig.6.02.



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The far edge of the disc is just visible,when viewed from the edge of the bowl.The bols is filled with transparent liquid of refractive index μ and the near edge of the disc becomes just visible.How far below the top of the bowl is the disc placed?

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105. A thin convex lens of focal length 25 cm is cut into two pieces 0.5 cm above the principal axis. The top part is placed at (0,0) and an object placed at (-50cm, 0). Find the coordinates of the image.

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106. In many experimental set-ups, the source and screen are fixed at a distance say D and the lens is movable.Show that there are two positions for the lens,for which an image is formed on the sceen.Find the distance between these points and the ratio of the image sizes for these two points.

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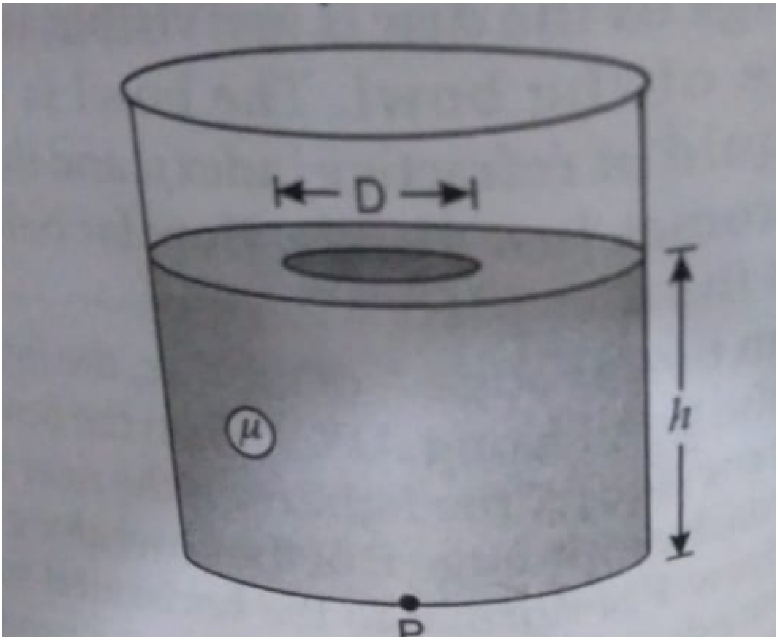
107. A jar of height h is filled with a transparent liquid of refractive index μ as shown in Fig.6.05.



At the centre of the jar on the bottom surface is a dot.Find the minimum diameter of a disc,such that when placed on the top surface symmetrically about the centre,the dot is invisible.

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108. A myopic adult has a far point at 0.1m. His power of accomodation is 4 dioptres

What power lenses are required to see distant objects?

(Take the image distance from the lens of the eye to the retina to be 2 cm).

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109. A myopic adult has a far point at 0.1m. His power of accomodation is 4 dioptres

What is his near point without glasses?

(Take the image distance from the lens of the eye to the retina to be 2 cm).

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110. A myopic adult has a far point at 0.1m. His power of accomodation is 4 dioptres

What is his near point with glasses?

(Take the image distance from the lens of the eye to the retina to be 2 cm).

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111. Which characteristic of the medium determine the velocity of longitudinal sound waves in a medium?

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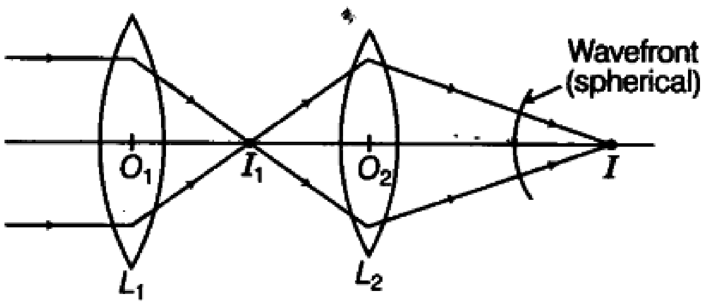
112. Consider a point at the focal point of a convergent lens. Another convergent lens of short focal length is placed on the other side. What is the wavefronts emerging from the final image?



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113. What is the shape of the wavefront on earth for sunlight?

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114. Why is the diffraction of sound more evident in daily life that of the light waves?

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115. The human eye has an approximate angular resolution of $\phi = 5.8 \times 10^{-4}$ rad and a typical photoprinter prints a minimum of 300 dpi (dots per inch, 1 inch = 2.54 cm). At what minimal distance z should a printed page be held so that one does not see the individual dots.

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116. A polaroid (I) is placed in front of a monochromatic source. Another polaroid (II) is placed in front of this polaroid (I) and rotated till no light passes. A third polaroid (III) is now placed in between (I) and (II). In this case, will light emerge from (II). Explain.

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117. Can reflection result in plane polarised light if the light is incident on the interface from the side with higher refractive index?

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118. For the same objective,find the ratio of the least separation between two points to be distinguished by a icroscope for light of $5,000\overset{\circ}{A}$ and elecrons accelerated though 100 V used as the illuminating substance.

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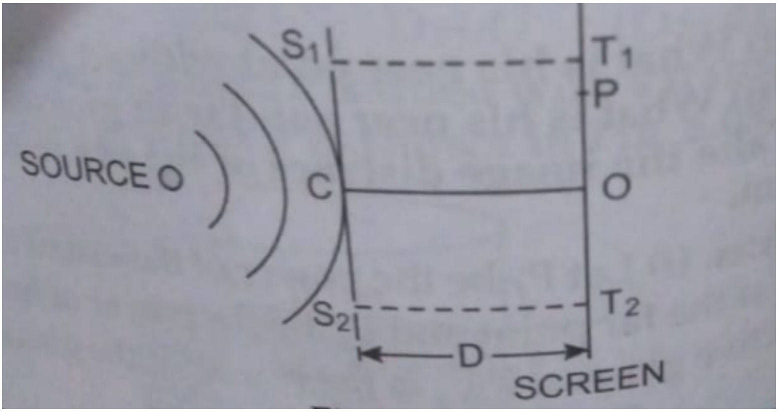
119. Conisder a two slit interference arrangement as shown in Fig.6.07.



Here,CO=D and $S_1C = SC_2 = D$i.e. the distance of the screen from the slits is half the distance between the slits.Obtain the value of D in terms of λ,such that the first minima on the screen falls at a distance D from the cetreO.

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EXERCISE

1. To get five images of a single object, one should have two plane mirrors at an angle of :

A. 60°

B. 90°

C. 120°

D. 30°.

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2. A motor car is fitted with a convex driving mirror of focal length 20 cm. A second motor car 2 m board and 1.6 m high is 6 m away from the first car.

Calculate the position and size of the image of the second car seen in the mirror of first.

A. $1/10ms^{-1}$

B. $1/15ms^{9}-1)$

C. $10ms^{9} - 1)$

D. $15ms^{-1}$.

Watch Video Solution

3. An experiment is performed to find the refractive index of glass using a travelling microscoe.In this experiment,distnce are measure by

A. a screw gauge provided on the microscope.

B. a vernier scale provided on the microscope

C. a metre scale provided on the icroscope.

D. a standard laboratory sclae.

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4. A transparent solid cylindrical rod has a refractive index of $\frac{2}{\sqrt{3}}$) .It is surrounded by air. A light ray is incident at the mid-point of one end of the rod as shown in the figure. The incident angle theta for which the light ray grazes along the wall of the rod is:

A. $\sin - 1(3 - \sqrt{2})$

B. $\sin^{-1}(\sqrt{3}/2)$

C. $\sin^{-1}(1/\sqrt{3})$

D. $\sin^{-1}(2/\sqrt{3})$.

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5. In an optics experiment, with the position of the object fixed, a student varies the position of a convex lens and for each position, the screen is adjusted to get a clear image of the object. A graph between the object distance u and the image distance v, from the lens, is plitted using the same scale for the two axes.

A straight line passing through the origin and making an angle of 45^circ with x-axis meets the experimental curve at P. The coordinates of P will be.

A. $(f/2, f/2)$

B. (f, f)

C. $(-2f, 2f)$

D. $(4f, 4f)$.

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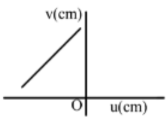
6. A student measures the focal length of a convex lens by putting an object pin at a distance u from the lens and measuring the distance v of the image pin. The graph between u and v plotted by the student should look like

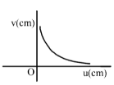
A.

(a)

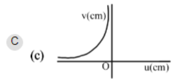


B.

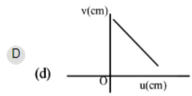
B (b)



C.



D.



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7. Which of the following phenomenon is used in optical fiber?

A. Total internal reflection

B. Scattering

C. Diffraction

D. Refraction

Watch Video Solution

8. The refractive index of water is $4/3$.How much time will light take to travel through a water column of length 500 m?

A. $36\sqrt{7}$

B. $36 / \sqrt{7}$

C. $36\sqrt{5}$

D. $4\sqrt{5}$.

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9. A plano convex lens of refractive index 1.5 and radius of curvature 30cm. Is silvered at the curved surface. Now this lens has been used to form the image of an object. At what distance from this lens an object be placed in order to have a real image of size of the object.

A. 20 cm

B. 30 cm

C. 60 cm

D. 80 cm

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10. Two lenses of powers+15D and -5D are in contact with each other. What is the focal length of combination?

A. $-20cm$

B. $-10cm$

C. $+20cm$

D. $+10cm$.

Watch Video Solution

11. A convex lens of refractive index 1.5 has a focal length of 18 cm in air.Calculate the change in focal length,when it is immersed in water of refractive index $4/3$.

A. 1D

B. $-1D$

C. $25D$

D. $-25D$.

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12. The refractive indices of the crown glass for blue and red light are 1.51 and 1.49 respectively and those of the flint glass are 1.77 and 1.73 respectively.An isosceles prism of angle 6° is made of crown glass.A beam of white light is incident at a small angle on this prism .The other flint glass isosceles prism is combined with the crown glass prism such that there is no deviation of teh incident light.Determine the angle of the flint glass prism.Calculate the net dispersion of the combined system.

A. δ_1 can be less than or greater than δ_2 ,depending upon the values of δ_1 and δ_2.

B. $\delta_1 < \delta_2$

C. $\delta_1 = \delta_2$.

D.

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13. The total magnification produced by a compound microscope is 20,while that produced by the eye-piece alone is 5.When the microscope is focussed on a certain object,the distance between objective nad eye-piece is 14 cm.Find the focal length of objective and eye-piece,if distance of distinct vision is 20 cm.

A. virtual and diminished

B. real and diminished

C. real and enlarged

D. virtual and enlarged.

Watch Video Solution

14. Explain with reason,how the resolving power of an astronomical telescoe will change when

aperture of the objective lens is halved.

A. reduce spherical aberration

B. have high resolution

C. increase span of observation

D. have low dispersion.

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15. An initially parallel cylindical beam travels in a medium of refractive index $\mu(I) = \mu_0 + \mu_2 I$,where μ_0 and μ_2 are positive constants and I is the intensity of the light beam.The intensity of the light beam is decreasing with increasing radius.

The initial shape of the wave front is

A. convex

B. concave

C. convex near the axis and concave near the periphery.

D. planar.

Watch Video Solution

16. An initially parallel cylindical beam travels in a medium of refractive index $\mu(I) = \mu_0 + \mu_2 I$,where μ_0 and μ_2 are positive constants and I is the intensity of the light beam.The intensity of the light beam is decreasing with increasing radius.

The speed of the light in the medium is

A. minimum on the axis of the bem

B. maximum on the axis of the beam

C. directly proportional to the intensity I.

D.

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17. An initially parallel cylindical beam travels in a medium of refractive index $\mu(I) = \mu_0 + \mu_2 I$,where μ_0 and μ_2 are positive constants and I is the intensity of the light beam.The intensity of the light beam is decreasing with increasing radius.

As the beam enters the medium,it will

A. diverge

B. converge

C. diverge near the axis and converge near the periphery.

D. travel as a cylindrical beam.

Watch Video Solution

18. What is the main condition to produce interference of light?

A. nearly the same frequency

B. the sme frequency

C. different wavelength

D. the same frequency nd having a definite phase relationship.

Watch Video Solution

19. In Young's double slit experiment what is the shape of interference fringes?

A. hyperbola

B. circle

C. straight line

D. parabola

Watch Video Solution

20. In a Young's double slit experiment,the intensity at a point,where the path difference is $\lambda / 6(\lambda$ being the wabelength of the light used) is I .If I_0 denotwes the maximum intensity,then I / I_0 is equal to

A. $1/\sqrt{2}$

B. $\sqrt{3}/2$

C. $1/2$

D. $3/4$.

Watch Video Solution

21. A beam of light consisting of two wavelengths, 650 nm and 520 nm, is used to obtain interference fringes in a Young experiment.- Find the distance of the third bright fringe on the screen from the central maximum for wavelength 650 nm.

A. $393.4nm$

B. $442.5nm$

C. $776.8nm$

D. $885.0nm.$

Watch Video Solution

22. Define coherent sources of light, fringe width and interference of light. Show that the width of dark fringe is equal to the width of bright fringe in Young's double slit experiment.

A. infinite

B. five

C. three

D. zero

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23. The question has a paragraph followed by two statements, Statement 1 and Statement 2. Of the given four alternatives after the statements, choose the one that best describes the statements..Statement 1 : When light reflects from the air-glass plate interface, the reflected wave suffers a phase change of π Statement 2 : The center of the interference pattern is dark.

A. Statement-1 is true,Statement-2 is flase.

B. Statement-1 is true,Statement-2 is true, Statement-2 is the correct explanation of Statement-1.

C. Statement-1 is true,Statement-2 is true,Statement-2 is not the correct explanation of Statemenet-1

D. Statement-1 is flase,Statement-2 is true.

24. If I_0 is the intensity of the principal maximum in the singel slit diffraction pattern,then what will be its intensity when the slit width is doubled?

A. $2I_0$

B. $4I_0$

C. I_0

D. $I_0 / 2$.

Watch Video Solution

25. Two point white dots are 1 mm apart on a black paper.They are viewed y eye of pupil diameter 3 mm.Approximately,what is the maximum distance at which these dots can be resolved by the eye? Take wave length of light =500 nm

A. 5 m

B. 1 m

C. 6m

D. 3m

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26. Wavelength of light used in an opticla instrument are $\lambda_1 = 4,000\overset{\circ}{A}$ and $\lambda_2 = 5,000\overset{\circ}{A}$,then ratio of their respective resolving powers(corresponding to λ_1 and λ_2) is:

A. $16:25$

B. $9:1$

C. $4:5$

D. $5:4$.

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27. This angle of incidence at which relfeted ligth is totally polarised for reflection from air to glass(refractive index μ),is:

A. $\sin^{-1}\mu$

B. $\sin^{-1}(1/\mu)$

C. $\tan^{-1}(1/\mu)$

D. $\tan^{-1}\mu$.

Watch Video Solution

28. When an unpolarised light intensity I_0 is incident on a polarising sheet ,the intensity of the light which does not get transmitted is

A. $I_0/2$

B. $I_0/4$

C. zero

D. I_0.

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29. Ray optics is valid,when characteristic dimenstions are

A. much smaller than the wavelength of light.

B. much larger than the wavelength of light.

C. of the same order as the wavelengt of light.

D. of the order of one millimetre.

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30. A person is six feet tall.How tall must a vertical mirror be,if he is able to see his entire length?

A. 6 ft

B. 4.5 ft

C. 7.5 ft

D. 3 ft.

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31. A beam of monochromatic light is refracted from vacuum into a medium of refractive index 1.5.The wavelength of refracted light will be

A. same

B. dependent on intensity of refracted light.

C. larger

D. smaller.

Watch Video Solution

32. Green light of wavelegth $5, 460\overset{\circ}{A}$ is incident on an air-glass interface.If the refractive index of glass is 1.5.the wavelength of light in glass would be

A. $3, 640\mathring{A}$

B. $5, 460\mathring{A}$

C. $4, 861\mathring{A}$

D. None of the above.

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33. The frequency of ligth in a material is $2 \times 10^{14} Hz$ and wavelength is $5, 000\overset{\circ}{A}$.The refractive index of the material will be

A. 1.4

B. 1.5

C. 3

D. 1.33

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34. A ray of light travelling in air have wavelength λ,frequency v,velocity u and intensity I.If this ray enters into water,then these parameters are λ', v', u' and I' respectively.which of the following relation is correct?

A. $\lambda = \lambda'$

B. $v = v'$

C. $u = u'$

D. $I = I'$.

Watch Video Solution

35. The refractive index of water is 1.33.What will be the speed of light in water?

A. $3 \times 10^{8} ms^{-1}$

B. $2.26 \times 10^{8} ms^{-1}$

C. $4 \times 10^{8} ms^{-1}$

D. $1.3 \times 10^{8} ms^{-1}$.

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36. Light travels through a glass plate of thickness t and having a refractive index μ.If c is the velocity of light in vacuum,the time taken by the ligth to travel this thickness fo glass is

A. $t\mu c$

B. tc/μ

C. $\mu c/t$

D. $\mu t/c$.

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37. If $i\mu_j$ represents refractive index,when a light ray goes from medium i to medum j,then the product $\hat{}\ 2\mu_1$ xx $\hat{}\ 3\mu_2$ xx $\hat{}\ 4\mu_3$ is equal to

A. $3\mu_1$

B. $3\mu_2$

C. $4\mu_1$

D. $4\mu_2$.

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38. The refractive index of air w.r.t. med 1 is $6/7$.The refractive index of med 2 w.r.t air is $7/3$.Then ,the refractive index of med 1 w.r.t med 2 will be

A. $1/2$

B. $8/9$

C. $5/18$

D. $18/5$.

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39. A microscope is focussed ona mark on a piece of paper then a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark.How should the microscope be moved to get the mark in focus again?

A. 2 cm upward

B. 45 cm downward

C. 1 cm upward

D. 1 cm downward.

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40. A transparent cube of side 210 mm contains a small air bubble. Its apparent distance, when viewed through one face of the cube is 100 mm and when viewed through the opposite face is 40 mm. What is the actual distance of the bubble from the second face and what is the refractive index of the material of the cube?

A. 7 cm

B. 7.5 cm

C. 10.5 cm

D. 4.67 cm.

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41. A ray of light travelling in a transparent medium of refractie index μ falls on a surface separatign the medium from air at an angle of incidence of 45°.For which of the following velues of μ,the ray can indergo total internal reflection?

A. $\mu = 1.25$

B. $\mu = 1.33$

C. $\mu = 1.40$

D. $\mu = 1.50.$

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42. Velocity of light in a liquid is $1.5 \times 10^8 ms^{-1}$ and in air,it is $3 \times 10^8 ms^{-1}$.If a ray of light passes from this liquid to air ,calculate the value of critical angle.

A. less then $\sin^{-1}(2/3)$

B. equal to $\sin^{-1}(2/3)$

C. equal to or less than $\sin^{-1}(3/5)$

D. equal to or greater than $\sin^{-1}(3/4)$.

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43. Name the physical principle on which th eworking of potical fibres is bases.

A. Total internal reflection

B. less scattering

C. refraction

D. less absorption coefficient

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44. A plano-convex lens is made of refractive index 1.6.If the radius of curvature of the curved surface is 60 cm,then focal length of the lens is:

A. 50 cm

B. 100 cm

C. 200 cm

D. 400 cm

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45. Focal length of a convex lens of refractive index 1.5 is 2 cm.Focal length of lens,when immersed in a liquid of refractive index of 1.25 will be

A. 10 cm

B. 7.5 cm

C. 5 cm

D. 2.5 cm

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46. A convex lens is dipped in a liquid,whose refrctive index is equal to the refractive index of the lens.then,its focal length will

A. become zero

B. become infinite

C. remain unchanged

D. become small,but non-zero

Watch Video Solution

47. A lens is placed between a souce of light and a wall.It forms images of areas A_1 and A_2 on the wall for its two different positions.The area of the source of light is

A. $\sqrt{A_1 A_2}$

B. $\frac{A_1 + A_2}{2}$

C. $\frac{A_1 - A_2}{2}$

D. $\frac{1}{A_1} + \frac{1}{A_2}$.

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48. A boy is trying to start a fire by focussing sunlight on a piece of paper using an equiconvex lens of focal length 10 cm.The diamerter of the sun is 1.39×10^9m and its mean distance form the earth is 1.5×10^{11}

.What is the diameter of the sun's image on the paper?

A. $6.5 \times 10^{-5} m$

B. $6.5 \times 10^{-4} m$

C. $9.3 \times 10^{-4} m$

D. $12.4 \times 10^{-4} m.$

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49. A bulb is located on a wll.Its image of equal size is to be obtained on a parallel wall with the help of a convex lens .The lens is placed at a distance d ahead of second wall.Then the required focal length will be

A. only $d/4$

B. only $d/2$

C. more than $d/4$ but less than $d/2$

D. less than $d/4$.

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50. A luminous object is placed at a distance of 30 cm from the convex lens of focal length 20 cm.On the other sie of the lens,at what distance from the lens,a convex mirror of radius of curvature 10 cm be placed in order to have an upright imae of the object coincident with it?

A. 12 cm

B. 30 cm

C. 50 cm

D. 60 cm/

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51. A lens having focal length f and aperture of diameter $d/2$ in the central region of the lens is covered by a black paper.Focal length of the lens and intensity of image image now will be respectively

A. f and $1/4$

B. $3f/4$ and $I/2$

C. f and $3I/4$

D. $f/2$ and $I/2$.

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52. A plano-convex lens is made of a material of refrative index $\mu = 1.5$.The radius of curvature of curved surface of the lens is 20 cm.If its plane surface is silvered,the focal length of the silvered lens will be

A. 10 cm

B. 20 cm

C. 40 cm

D. 80 cm

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53. The radius of curvatrure of a thin plano-convex lens is $10cm$ (of cured surface) and the refractive index is 1.5.If the plane surface is silvered,then it behaves like a concavemirror of focal length

A. 20 cm

B. 15 cm

C. 10 cm

D. 5 cm.

54. A convex lens is dipped in a liquid,whose refrctive index is equal to the refractive index of the lens.then,its focal length will

A. become zero

B. become infinite

C. remain unchanged

D. become small,but non-zero

55. If a convex lens of focal length 80 cm and a concave lens of focal length 50 cm re combined together ,what will be their resulting power?

A. $+6.5D$

B. $-6.5D$

C. $+7.5D$

D. $-0.75D.$

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56. A convex lens and a concave lens ,each having same focal length of 25 cm,are put in contact to form a combination of lenses.the power of the combination (in diopters) is

A. zero

B. 25

C. 50

D. infinite

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57. Two thin lenses of focal length f_1 and f_2 are in contact and coaxial.The power of the combination is

A. $(f_1 + f_2)/2$

B. $(f_1 + f_2)/f_1 f_2$

C. $\sqrt{f_1/f_2}$

D. $\sqrt{f_2/f_1}$.

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58. A beam of light composed of red and greeen ray is incident obliquely at a point on the face of rectangular glass slab.When coming out on the opposite parallel face,the red and green ray emerge from

A. two points propagating in two different non-parallel directions

B. two points propagting in two different parallel directions

C. one point propagating in two different directions

D. one point propagting in the same direction.

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59. A ray light is incident on a 60° prism at the minimum deviation position.The angle of refraction at the face (i.e.incident face)of the prism is:

A. zero

B. 30°

C. 45°

D. 60°.

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60. The refracting angle of a prism is 60° nd the refractive index of the material of the prism is 1.732.Calculate the angle of minimum deviation.

A. 45°

B. 60°

C. 37°

D. 30°.

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61. A ray is incident at an angle of incidence i on one surface of a prism of small angle A and emerges normally from the opposite surface. If the refractive index of the material of the prism is μ, the angle of incidence i is nearly equal to

A. A / μ

B. $A / 2\mu$

C. μA

D. $\mu A/2$.

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62. The refractive index of the amterial of a prism is $\sqrt{2}$ and its refracting angle is 30°.One of the refracting surface of the prism is made a mirror inwards.A beam of monochromatic light entering the prism from the other face will retrace its path after reflecting from the mirrored surface,if its angle of incidence on the prison is

A. 45°

B. 60°

C. 0°

D. 30°.

Watch Video Solution

63. The focal length of a coverging lens is measured for violet,green and red colours.It is f_v, f_g and f_r respectively.We will get

A. $f_v = f_g$

B. $f_g > f_r$

C. $f_v < f_r$

D. $f_v > f_r$.

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64. If f_v and f_r are the focal lengths of a convex lens fro violet and red light respectively and F_v and F_r are the respective focal length of a concave lens,then we must have

A. $f_v > f_r$ adn $F_v < F_r$

B. $f_v < f$ and $F_v < F_r$

C. $f_v > f_r$ and $F_v > F_r$

D. $f_v < f_r$ and $F_v > F_r$.

Watch Video Solution

65. Rainbow is formed due to combination fo

A. refraction and sattering

B. refraction and absorption

C. dispersion and total internal reflection

D. dispersion and focussing.

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66. For relaxed eye,magnifying power of a microscope is

A. $\frac{v_0}{u_0} \times \frac{D}{f_e}$

B. $\frac{v_0}{u_0} \times \frac{f_w}{D}$

C. $\frac{u_0}{v_0} \times \frac{D}{f_e}$

D. $\frac{u_0}{v_0} \times \left(-\frac{D}{f_e}\right)$.

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67. An astronomical telescope of ten fold angular magnification has a length of 44 cm.The focal length of the objective is

A. 4 cm

B. 40 cm

C. 44 cm

D. 440 cm

Watch Video Solution

68. Which one off the following phenomena is not explained by Huygens' construction f wavefront?

A. Refraction

B. Reflection

C. Diffraction

D. Origin of spectra.

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69. Ratio of intensity of two waves is given by 4:1. Then, ratio of the amplitude of the two waves is:

A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$.

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70. How is interference pattern in double slit exp[eriment affected,if a source of blue lught is used in place of yellow light producing the same intensity?

A. The fringe width will decrease.

B. The fringe width will increse

C. The fringes will becom brighter.

D. The fringes will become fainter.

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71. Interference was observed in interference chamber,when air was present.Now,the chamber is eacuated and if the same ligth is used,a careful observer will see

A. no interference.

B. inrterference with bright bands

C. interference with dark bnds

D. interference,in which width of the fringe will be slightyly increased.

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72. In Young's double silt experiment, the fringe width obtained is 3 mm in air. If the apparatus is immersed in water $(\mu = 4/3)$,what will be the new fringe width?

A. 0.3 mm

B. 0.4 mm

C. 0.53 mm

D. 540 microns

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73. In a Young's experiment,two coherent sources are placed 0.9 mm apart and the fringes are observed 1 m away.If it produces the second dark fringe at a distance of 1 mm from the central fringe,the wavelength of monochromatic ligth used would be

A. $60 \times 10^{-4} cm$

B. $10 \times 10^{-4} cm$

C. $10 \times 10^{-5} cm$

D. $6 \times 10^{-5} cm$.

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74. In a Fresnel biprism experiment,the two positions of lens give separation between the slits as 16 cm and 9 cm respectively.What is the

actual distance of separation?

A. 12.5 cm

B. 12 cm

C. 13 cm

D. 14 cm

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75. Colours appear on a thin soap film and soap bubbles due to the phenomenon of

A. interference.

B. scattering

C. diffraction

D. dispersion.

Watch Video Solution

76. The frequency of e.m. wave which is best suited to observe a particle of radius $3 \times 10^{-6} m$,is of the order of

A. 10^{15}

B. 10^{13}

C. 10^{14}

D. 10^{12}.

Watch Video Solution

77. A telescope has an objective lens of 10 cm diameter and is situated at a distance of 1 km from two objects.The can be resolved by the telescope, when the mean wavelength of light is $5,000\overset{\circ}{A}$,is of the order of

A. 0.5 m

B. 5 m

C. 5 mm

D. 5cm

Watch Video Solution

78. Diameter of human eye lens is 2 mm.What will be the minimum distance between two points to resolve them,which are situated at a distacne of 50 m from eye?The wavleength of ligth is $5,000\overset{\circ}{A}$.

A. 2.32 mm

B. 4.28 mm

C. 1.525 cm`

D. $12.48cm$.

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79. Which one of the following statement is true?

A. Both light and sound waves can travel in vacuum.

B. Both light and sound waves in air are longitudinal.

C. The sound waves in air are longitudinal,while the light waves are transverse.

D.

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80. A ray of light from a rarer medium strikes a denser medium.

The reflected and refracted rays make an angle of 90° with each other .the angles of reflection and refraction are r and r' .The critical angle would be

A. $\sin^{-1}(\tan r)$

B. $\tan^{-1}(\sin r)$

C. $\sin^{-1}(\tan r')$

D. $\tan^{-1}(\sin r')$.

Watch Video Solution

81. Velocity of light in a liquid is $1.5 \times 10^8 ms^{-1}$ and in air,it is $3 \times 10^8 ms^{-1}$.If a ray of light passes from this liquid to air ,calculate the value of critical angle.

A. equal to $\sin^{-1}(2/3)$

B. less than $\sin^{-1}(2/3)$

C. equal to or greater than $\sin^{-1}(3/4)$

D. equal to or less than $\sin^9 - 1)(3/5)$.

Watch Video Solution

82. A ray light is incident on a 60° prism at the minimum deviation position.The angle of refraction at the face (i.e.incident face)of the prism is:

A. `0^@

B. 30°

C. 45°

D. 60°.

Watch Video Solution

83. A thin prism of angle 15° made of glass of refractive index = 1.5 is combined with another prism of glass of refractive index = 1.75 .The combination of prism produces dispersion without deviation.The angle of the second prism should be

A. 5°

B. 7°

C. 10°

D. 12°.

Watch Video Solution

84. Two mirrors are kept at 60° to each other and a body is placed at middle .The total number of images formed is

A. six

B. four

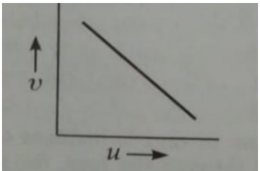
C. five

D. three

Watch Video Solution

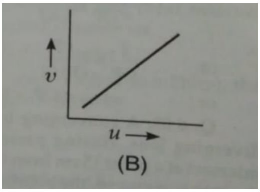
85. In an experiment ot find the focla length of a concave mirror,a graph is drawn between the magnitude of u and v.The graph looks like

A.

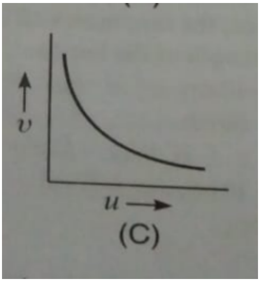


(A)

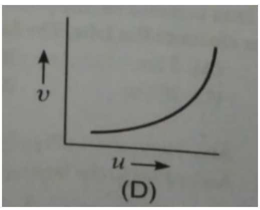
B.



C.



D.



Watch Video Solution

86. A concave mirror of focal length 15 cm forms an image having twice the linear dimenstions of the objet.The position of the object,when the image is virtual,will be

A. 22.5 cm

B. 7.5 cm

C. 30 cm

D. 45 cm

87. When a ray of light enters a glass slab,then

A. its frequency and velocity change

B. only frequency changes.

C. its frequency and wavelengt cahnge

D. its frequency does not change.

88. An electromagnetic radiation of frequency v ,wave-length γ,travelling with velocity c in air ,enters a glass slab of refractive index μ.the frequency,wavelegth and velocity of light in the glass slab will be respectively

A. v chnges

B. v does not chagne,λ changes

C. λ does not change.

D. v and λ change.

Watch Video Solution

89. In refraction,light waves are bent on passing from one medum to the second medium,because in the second medium

A. the frequency is different

B. the coefficient of elasticity is different

C. the speed is different

D. the amplitude is smaller.

Watch Video Solution

90. A ray of light having wavelength 720 nm enters in a glas of refractive index 1.5 .the wavelength of the ray within the glass will be

A. 360 nm

B. 480 nm

C. 720 nm

D. 1080 nm

Answer: 1,080 nm

Watch Video Solution

91. Light of having wavelength λ and of intensitty I_0 passes through a material of thickness d.The resulatant intensity is

A. $I = I_0 e^{-d\lambda}$

B. $I = I_0 \left(1 - e^{-d\lambda}\right)$

C. $I = I_0 \left(1 - ^{-d/\lambda}\right)$

D. $I = I_0 e^{-d/\lambda}\Big)$.

Watch Video Solution

92. The apparent depth of water in cylindrical water tank of diameter 2 R cm is reducing at the rate of x $cm/\min$ when water is being drained out at a constant rate .The amount of water drained in c.c. per minute is (μ_1= refractive index of air, μ_2 = refractive index of water)

A. $\frac{x\pi R^2\mu_1}{\mu_2}$

B. $\frac{x\pi R^2\mu_2}{\mu_1}$

C. $\frac{2\pi R\mu_1}{\mu_2}$

D. $\frac{2\pi R\mu_2}{\mu_1}$.

Watch Video Solution

93. Mirage' is a phenomenon due to

A. reflection of light

B. refraction on light

C. total internal reflection of light

D. diffraction of light.

Watch Video Solution

94. A lens when immersed in a transparent liquid becomes invisible. Under what condition does it happen?

A. behave as a perfect reflector

B. absorb all light falling on it

C. have refractive index one

D. have refractive index exactly mathich with that of the surrounding fluid.

Watch Video Solution

95. Glittering of diamond is due to

A. shape

B. cutting

C. reflection

D. total internal reflection

Watch Video Solution

96. An endoscope is employed by a physician to view the internal parts of a body organ.It is based on the principle of

A. refraction

B. reflection

C. total internal reflection

D. dispersion

Watch Video Solution

97. A wire mesh consisting of very small squares is viewed at a distacne of 8 cm through a mangifying converging lens of focal length 10 cm,ekpt clse to the eye.The mangification produced by the lens is

A. 5

B. 8

C. 10

D. 20

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98. A lens is made of flint glass(refractive index=1.5).When the lens is immersed in a liquid of refractive index 1.25 ,the focal length

A. increases by a factor of 1.25

B. increses by a factor of 2.5

C. increases by a factor o 1.2

D. decreases y a factor of 1.2

Watch Video Solution

99. A thin glass (refractie index = 1.5) lens has optical power of -5 D in air.Its optical power in a liquuid of refractive index 1.6 will be

A. 1D

B. $-1D$

C. $-25D$

D. $25D$

Watch Video Solution

100. Two thin lenses of focal length f_1 and f_2 are placed in contant .The focal length of the composite lens will be

A. $(f_1 + f_2) / 2$

B. $(f_1 + f_2) / f_1 f_2$

C. $\sqrt{f_1 / f_2}$

D. $f_1 f_2 / (f_1 + f_2)$.

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101. Two lenses of power +12 D and -2D are combined together.What is their equivalent focal length?

A. 10 cm

B. 12.5 cm

C. 16.6 cm

D. 8.33 cm

Watch Video Solution

102. If two lenses of power +1.5 D and +1.0 D are placed in contact ,then the effective power of combination will be

A. 2.5 D

B. 1.5 D

C. 0.5 D

D. 3.25 D.

Watch Video Solution

103. Flash light equipped witha new set of bateries,produces bright white light.As the batteries wear out,

A. the light inentsity gets reduced with no change in its colour

B. light colour changes first to yellow and then red with no change in intensity

C. it stops working sudeny,while giving white light.

D. colour changes to red and also intensity gets reduced.

Watch Video Solution

104. The angle of a prism is 6° and its refractive index for green light is 1.5 .If a green ray passes through it,the deviation will be

A. 30°

B. 15°

C. 3°

D. 0°.

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105. The sky appears blue, because.

A. diffraction

B. dispersion

C. scattering

D. polarisation

Watch Video Solution

106. One cannot see through fog, because:

A. fog absorbs the light.

B. light suffers total reflection at droplets

C. refractive index of the fog is infinity

D. light is scattered by the ddroplets.

Watch Video Solution

107. A leaf which contains only green pigments is illuminated by a laser ligth of wavelength $0.6328 \mu m$.It would appear to be

A. brown

B. black

C. red

D. green

108. Fraunhofer lines of the solar system is an example of

A. emission line spectrum

B. emission band spectrum

C. conitnuos emission spectrum

D. line absorption spectrum.

109. 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?

A. 1.5 D

B. $-1.5D$

C. $6.5D$

D. $-6.5D$

Watch Video Solution

110. A person using a lens as a simple microscope sees a

A. uprigt virtual image

B. inverted virtual image

C. inverted real magnified image

D. upright real manified mage.

Watch Video Solution

111. The focal length of the objective and eye piece of a telescope are respectively 200 cm and 5 cm.the maximum magnifying power of the telescope will be

A. -40

B. -48

C. -60

D. -100.

Watch Video Solution

112. A telescope has an objective lens of focal length 200 cm and an eye piece with focal length 2 cm.If this teleescope is used to see a 50 metre tall building at a distance of 2 km,what is the height of the image of the building formed by the objective lens?

A. 5 cm

B. 10 cm

C. 1 cm upward

D. 2cm

Watch Video Solution

113. The astronomical telescope consists off objective and eye-piece.The focal length of the objective is

A. five times shorter than that of the eye - piece.

B. equal to that of the eye-piece

C. greater than that of the eye-piece

D. shorter than that of the eye-piece.

Watch Video Solution

114. Four lenses of focal length + 10 cm,+50 cm,+100 cm and + 200 cm are available for making an astronnomical tetescope.To produce the largest magnification,the focal length of the eye-piece should be

A. $+10cm$

B. $+50$

C. $+100$

D. $+200cm$

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115. According to Huygen's principle, light is a form of

A. particle

B. ray

C. wave

D. none of the above

Watch Video Solution

116. Light propagates rectilinearly,because of its

A. frequency

B. wavelength

C. velocity

D. wave nature

Watch Video Solution

117. Why does light appear to travel in straight line inspite of its wave nature.

A. its velocity is very large

B. it is not absorbed by surrounding

C. its wavelength is very small

D. it is reflected by surrounding

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118. Interference occurs in which of the following waves?

A. longitudinal

B. transverse

C. electromagnetic

D. all of these

Watch Video Solution

119. Ratio of inensitties of two waves is $9:1$ iff these waves are superimposed,what is the ratio of maximum and minimum intensities?

A. $9:1$

B. $3:1$

C. $4:1$

D. $5:3.$

120. Two waves of intensities I and 4 I superimpose, then maximum and minimum intensities are:

A. 5 I and 3I

B. 9 I and I

C. 9 I and 3 I

D. 5 I and I

Watch Video Solution

121. What happens to fringe width in the Young's double slit experiment,if its is performed in glycerine insteaad of air?

A. The fringes shringk

B. the fringes get enlarged

C. The fringes remain unchanged

D. The fringes disappear.

Watch Video Solution

122. A monochromatic beam of light is used for the formation of fringes on the screen by illuminating the two slits in the Young's double slit interference experiment. When a thin film of mica is interposed in the path of one of the interfering beams, then

A. the fringe width increases

B. the fringe width decreases

C. the fringe width remains the same but the pattern shifts

D. the fringe pattern disappears.

Watch Video Solution

123. What is the path difference for destructive interfernce?

A. $n\lambda$

B. $n(\lambda + 1)$

C. $(2n+1)\lambda/2$

D. $(n1)\lambda/2$

Watch Video Solution

124. Monochromatic ligth of wavelgth $6,000\overset{\circ}{A}$ is used in a Young's double slit experiment.One of the slits is covered by a transparent film of thickness 1.2×10^{-5} m having refractive index 1.4.How many fringes will shift due to the introduction of the film?

A. remain unshifted

B. shift downwrd by nearly two fringes

C. shift upwards by nearly two frings.

D. shift downwad by ten fringes.

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125. What happens,if the monochromatic light used in Young's double slit experiment is replace by white light?

A. No fringes are observed

B. All bright fringes become white

C. All bright grings have colours between violet and red

D. Only the central fringe is white and all the other fringes are coloured.

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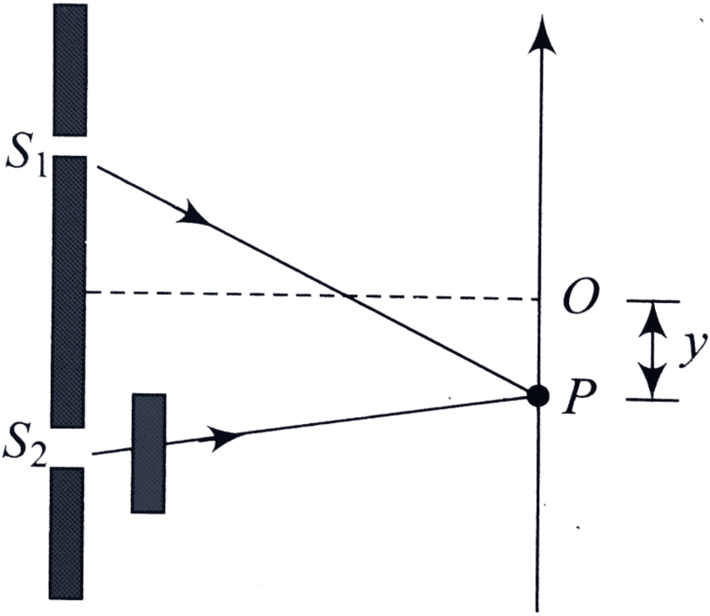
126. The Young's double-slit experiment is done in a medium of refractive index 4//3. A light of 600 nm wavelength is falling on the slits having 0.45 mm separation. The lower shift S_(2) is covered by a thin glass sheet of refractive index. 1.5. The interference pattern is observed on a screen placed 1.5 m from the slits as shown in Figure



a. Find the location of central maximum (bright fringe with zero path difference) on the y-axis.

A. fringes will disappear

B. fringe width will increse

C. fringe width will decrease

D. there will be no change in fringe width.

Watch Video Solution

127. Colours appear on a thin soap film and soap bubbles due to the phenomenon of

A. interference

B. diffraction

C. ineterference

D. refraction

Watch Video Solution

128. When a beam of light is usd to deterine the position of an object,the maximum accuracy is achieved,if the light is

A. polarised

B. of longer wavelength

C. of shorter wavelength

D. of high intensity

Watch Video Solution

129. Answer the following questions: In a single slit diffraction experiment, the width of the slit is made double the original width. How does this affect the size and intensity of the central diffraction band?

A. narrower and fainter

B. narower and brighter

C. broader and fainter

D. broader and brighter

Watch Video Solution

130. An astonaut is lookin down on earth's surface from a space shuttle at an altitude of 400 km.Assuming that the astronaut's pupil diamter is 5 mm and the wavelength of visible ight is 500 nm,The astonaurt will be able to resolve linear objects of the size of about:

A. 0.5 m

B. 5 m

C. 50 m

D. 500 m

Watch Video Solution

131. Golden view of sea shell is due to

A. diffraction

B. dispersion

C. polarisation

D. reflection

Watch Video Solution

132. In case of linearly polaised light ,the magnitude of the electric field vector:

A. is parallel to the direction of propagation

B. does not change with time

C. increases and decreases linearly with time

D. varies periodically with time

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133. At what angle of incidence will the light reflected from glass (=1.5) be completely polarised?

A. 403°

B. 51.6°

C. 56.3°

D. 72.8°.

Watch Video Solution

134. If a polaroid is kept in the path of a uniformly unpolarised light ,the intensity of the transmitted light to the intensity of the light ,when the polaroid is not kept in its path,is

A. 1

B. $1/2$

C. $1/\sqrt{2}$

D. $1/2\sqrt{2}$.

Watch Video Solution

135. What is elliptically polarised light?

A. changes in magnitude only

B. changes in direction only

C. remains constant

D. both (A) and (B).

Watch Video Solution

136. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the

following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: The flash of lightning is seen before the sound of thunder is heard.

Reason: Speed of sound is greater than speed of light.

A. A

B. B

C. C

D. D

Watch Video Solution

137. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: the mirror formula can be applied to a plane mirror.

Reason: A lane mirror is a spherical mirror of infinite focal length

A. A

B. B

C. C

D. D

Watch Video Solution

138. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:The formula connecting u,v and f for a spherical mirror is valid only for mirrors,whose sizes are very small as compared to their radii of curvature.

Reason:Laws of reflectoin ar strictly valid for plane surfaces,but not for large spherical surfaces.

A. A

B. B

C. C

D. D

Watch Video Solution

139. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A person cannot see his image in a concave mirror, unless he is situated beyond the centre of curvature of the mirro.

Reason:In a concave mirror image formed is real,provided the object is situated beyond its focus.

A. A

B. B

C. C

D. D

Watch Video Solution

140. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: the frequencies of incident ,reflected and refracted beam of monochromatic light incident from one medium to another are same.

Reason: The incident, reflected and refracted rays are coplanar.

A. A

B. B

C. C

D. D

Watch Video Solution

141. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: The sun looks bigger in size at sunrise and sunset than during day.

Reason: The phenomenon of diffraction bends light rays.

A. A

B. B

C. C

D. D

Watch Video Solution

142. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: in optical fibre, the diameter of the core is kept small.

Reason: This smaller diameter of the core ensures that the fibre should have incident angle more than the critical angle required for total internal reflection.

A. A

B. B

C. C

D. D

Watch Video Solution

143. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: Diamond glitters brilliantly.

Reason: Diamond does not absorb sunlight.

A. A

B. B

C. C

D. D

Watch Video Solution

144. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: Endoscopy involves use of optical fibres to study internal organs.

Reason: Optical fibres are based on phenomenon of total internal reflection.

A. A

B. B

C. C

D. D

Watch Video Solution

145. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: Virtual images are always erect.

Reason: Virtual images are formed by diverging lenses only.

A. A

B. B

C. C

D. D

Watch Video Solution

146. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct

explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: A concave and convex lens both have the same focal length in air. When they both have the same focal length in air. When they are submerged in water they will have the same focal length.

Reason: The refractive index of water is smaller than the refractive index of air.

A. A

B. B

C. C

D. D

Watch Video Solution

147. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the

following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Position of image approches focus of a lens,only when object approaches infinity.

Reason:Paraxial rays inident parallel to principal axis intersect at the focus after refraction from the lens.

A. A

B. B

C. C

D. D

Watch Video Solution

148. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:If a convex lens is kept in water,its convergent power decreses.

Reason:Focal length of convex lens in water increases.

A. A

B. B

C. C

D. D

Watch Video Solution

149. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:It is impossible to photograph a virtual image.

Reason:The rays which appear divergin from a virtual image fall on the camera and a real image is capture.

A. A

B. B

C. C

D. D

Watch Video Solution

150. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A famous painting ws painted by not using brush strokes in the usual manner,but rather a myrian of small colour dots.In this painting ,the colour you see at any given place on the painting changes as you move away.

Reason:The angular separation of adjacent dots changes with the distance from the painting.

A. A

B. B

C. C

D. D

Watch Video Solution

151. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:At the first glance,the top surface of the Morpho butterly's wing appears a beautiful blue-green.If the wind moves ,the colour changes.

Reason:Different pigments in the wing relfect light at differnt angles.

A. A

B. B

C. C

D. D

Watch Video Solution

152. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Blue colour of sky appears due to scattering of blue colour.

Reason:Blue coour has shortest wavelength in visible spectrum.

A. A

B. B

C. C

D. D

Watch Video Solution

153. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Danger signals aer made of red colour.

Reason:Velocity of red light is maximum and thus more visibility in dark.

A. A

B. B

C. C

D. D

Watch Video Solution

154. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: The clouds in sky generally appear whitish.

Reason: Diffraction due to clouds is efficient in equal measure at all wavelengths.

A. A

B. B

C. C

D. D

Watch Video Solution

155. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A red object appears dark in the yellow light.

Reason:The red colour is scattered less.

A. A

B. B

C. C

D. D

Watch Video Solution

156. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct

explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:The rainbow is seen sometimes in the sky,when it is raining.When one sees a rainbow,one's back is towards the sun.

Reason:Internal reflection from water droplet causes dispersion.The final ray is in the backward direction.

A. A

B. B

C. C

D. D

Watch Video Solution

157. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:In high latitudes,one sees colourful curtains of ligth hanging down from high altitudes.

Reason:The high enregy charged particles from the sun are deflected to polar regions by the magnetic field of the earth.

A. A

B. B

C. C

D. D

Watch Video Solution

158. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A single lens produces a coloured image of an object illuinated by white light.

Reason:the refractive index of the material of lens is different fro different wavelengths of light.

A. A

B. B

C. C

D. D

Watch Video Solution

159. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct

explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A normal human eye can clearly see all the objects beyond a certain minimum distance.

Reason:The human eye has the capacity to adjust suitably the focal length of its lens to a certain extent.

A. A

B. B

C. C

D. D

Watch Video Solution

160. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:For depth of camera,the aperture should be reduced.

REason:Smaller the aperture ,larger is its power.

A. A

B. B

C. C

D. D

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161. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Owls can move freely during night.

Reason:They have large number of rods on their retina.

A. A

B. B

C. C

D. D

Watch Video Solution

162. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:In a movie,ordinarly 24 frames are projected per second from one end to the other of the complete film.

Reason:The image formed on retina of eye is sutained upto $1/10$ s after the removal of srtimulus.

A. A

B. B

C. C

D. D

Watch Video Solution

163. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A lens short focal length can be used as a magnifying glass.

Reason : The angular magnification produced in relaxed eye viewing is less than the maximum angular magnification produced by a magnifying glass.

A. A

B. B

C. C

D. D

Watch Video Solution

164. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the

following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Corpuscular theory fails in explaining the velocities of light in air and water.

Reaon:According to corpuscular theory,light should travel faster in denser media than in rarer media.

A. A

B. B

C. C

D. D

Watch Video Solution

165. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement and reason is also false statement.

Assertion:In Young's double slit experiment ,the fringe width for dark fringes is different from that for white fringes.

Reason:In Young's double slit experimnet performed witha source of white light ,only black and bright fringes are observed.

A. A

B. B

C. C

D. D

Watch Video Solution

166. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:In Young's double slit experiment,the fringe width for dark fringes is equal to that for white fringes .

Reason:In Young's double slit experiment performed with a source of white light ,only black and white fringes are observed.

A. A

B. B

C. C

D. D

Watch Video Solution

167. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the

following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:No interfernce pattern is observed,when two coherent source are infinetely close to each other.

Reason:The fringe width is inversely proportional to the istance betwen the two slits.

A. A

B. B

C. C

D. D

Watch Video Solution

168. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:In Young's double slit experiment,the two slits are at distnace d apart.Interference pattern is obsreved on the screen .When it is directly opposite to one of the slits a dark fringe is observed.Then,the wavelength of the wave is proportional to the square of th distnce fo the slits.

Reason:For a dark fringe,the i ntensity is zero.

A. A

B. B

C. C

D. D

Watch Video Solution

169. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Thin films such as soap bubble or a thin layer of ol on water show beautiful colours,when illuminated by white light.

Reason:It happens due to the interfernce of light reflected from the upper and lower surface ot the thin film.

A. A

B. B

C. C

D. D

Watch Video Solution

170. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Newton's rings are formed in the reflected system.|When the space between the lens and the glass plate is filled with a liquid of refractive index gerter than that of glass,the central spot of the pattern in bright.

Reason:This is because,reflections in these cases will be ffrom a denser to a rartrer medium and the two - interfering rays are reflected under siilar conditins.

A. A

B. B

C. C

D. D

Watch Video Solution

171. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Coloured specrum is seen,when we look through a muslin cloth.

Reason:It is due to the diffraction of white light on pasing through fine slits.

A. A

B. B

C. C

D. D

Watch Video Solution

172. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:When a tiny circular obstacle is placed in th path of light from some distance,a bright spot is seen at the cente of the shadow of the ostacle.

Reason:Destructive interference occurs at the centre of the shadow.

A. A

B. B

C. C

D. D

Watch Video Solution

173. In these question, a statement of assertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion: Standard optical diffraction gratings cannot be used for discriminating between different X-ray wavelengths.

Reason: The grating spacing is not of the order of X-ray wavelengths.

A. A

B. B

C. C

D. D

Watch Video Solution

174. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the

following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:The resolving power of a telescope is more ,if the diameter of the objective lens is more.

Reason:Objectives lens of large diameter collects more light.

A. A

B. B

C. C

D. D

Watch Video Solution

175. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Radio waves can be polarised.

Reason:Sound waves in air are longitudinal.

A. A

B. B

C. C

D. D

Watch Video Solution

176. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:Sound waves cannot propagate through vacuum but light can.

Reason:Sound waves cannot be polarised.

A. A

B. B

C. C

D. D

Watch Video Solution

177. In these question, a statement of asertion followed by a statement of reason is given .Choose the correct answer out of the following choices:

Assertion and reason both are correct statements and reason is correct explanation for assertion.

Assertion and reason both are correct statements but reason is not correct explanation for assertion.

Assertion is correct statement but reason is wrong statement.

Assertion is wrong statement but reason is correct statement.

Assertion:A solution of sucrose in waer s dextro-rotatory.But on hydrolysis in the presense of a little hydrochloric acid,it becomes laevo - rotatory.

Reason:Sucrose on hydrolysis gives unequal amounts of glucose and fructose.As a result of this ,cnage is sign of rotation is observed.

A. A

B. B

C. C

D. D

Watch Video Solution

178. An objects is placed at a distance equal to focal length of convex mirror.If the focal length of the irror be f,then the distance of the image from the pole of the mirror is:

A. less than f

B. equal to f

C. more than f

D. infinite

Watch Video Solution

179. 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. 60 cm

B. 40 cm

C. 30 cm

D. 20 cm

Watch Video Solution

180. Velocity of light is maximum in

A. diamond

B. water

C. glass

D. vacuum

Watch Video Solution

181. Which of the following is not the property of light?

A. It requires a material medium for propagation

B. It can travel through vacuum

C. it involves transporation of enregy

D. It has finite speed.

Watch Video Solution

182. When light passes from one medium to another medium, which one of these quantities, remains unchanged.

A. Refractive index

B. Frequency

C. Wavelength

D. Velocity

Watch Video Solution

183. In refraction,light waves are bent on passing from one medum to the second medium,because in the second medium

A. the frequency is different

B. the coefficient of elasticity is different

C. the speed is different

D. the amplitude is smaller.

Watch Video Solution

184. Time taken by the sun igth to pass through a glas slab of 2 mm thickness,whose rrefrative index is 1.5 ,is

A. $10^{-8}s$

B. $10^{-11}s$

C. $10^{-6}s$

D. $10^{-9}s$.

Watch Video Solution

185. A ray o light is incident on the surface of separation of a medium with the velocity of igth at an angle 45° and is refracted in the medium at an angle 30°.Velocty of light in the medium will be:(Veloctiy of light= $3 \times 10^{8} ms^{-1}$).

A. $3.8 \times 10^{8} ms^{-1}$

B. $2.28 \times 10^{8} ms^{-1}$

C. $2.12 \times 10^{8} ms^{-1}$

D. $1.56 \times 10^{8} ms^{-1}$.

Watch Video Solution

186. A glass slab of thickness 12 mm is placed on a table .The lower surface of the slab has a black spot.At what depth from the upper surface will th espot appear,when viewed fromo above?The refractive index of glass =1.5.

A. 2 mm

B. 4 mm

C. 6 mm

D. 8 mm

Watch Video Solution

187. Total inrternal reflection tkes place

A. When a ray oves from denser to rarer medium and angle of incidence is greater than critical angle.

B. When a ray moves from rarer to denser medium and angle of incidence is less than critical angle

C. When a ray moves from rarer to denser medium and angle of incidence is equal to critical angle.

D. none of the above.

Watch Video Solution

188. The value of the critial angle is least for which of the following colours of light?

A. Violet

B. Green

C. Blue

D. Yellow

Watch Video Solution

189. Answer the following questions: A diver under water, looks obliquely at a fisherman standing on the bank of a lake. Would the fisherman look taller or shorter tothe diver than what he actually is?

A. taller than what he actually is

B. shorter than what he actually is

C. the same height as he actually is

D. depends on the obliquity.

Watch Video Solution

190. A pile 4 m high stands in the lake,such that it protrudes y 1m above the surface of water.Determine th elength of the shadow of the pile on the botton of lake,when the sunrays make an angle of 45° with the water surface.Tke refractive index of water,$\mu = 4/3$.

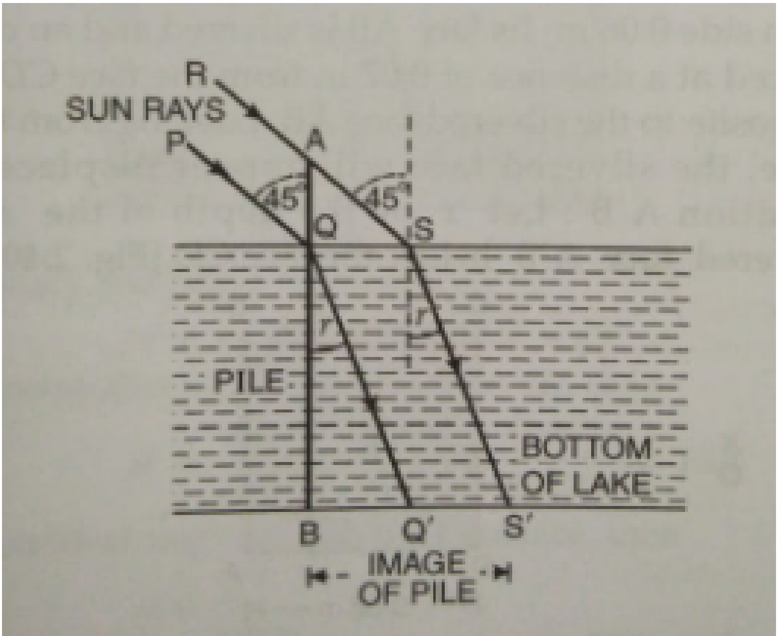

Fig. 2.37

A. 6 cm above the surface o water.

B. 6 cm below the surface of water

C. 18 cm above the wurface of waer

D. 32 cm above the surface of water.

Watch Video Solution

191. A transparent cube of side 210 mm contains a small air bubble. Its apparent distance, when viewed through one face of the cube is 100 mm and when viewed through the opposite face is 40 mm. What is the actual distance of the bubble from the second face and what is the refractive index of the material of the cube?

A. 0.04 m

B. 0.05 m

C. 0.06 m

D. 0.17 m

Watch Video Solution

192. If the critical angle for total internl reflection from a medium to vacuum is 30° then velocity of light in the medium is:

A. $1.5 \times 10^8 ms^{-1}$

B. $0.75 \times 10^8 ms^{-1}$

C. $3 \times 10^8 ms^{-1}$

D. $2 \times 10^8 ms^{-1}$.

Watch Video Solution

193. Light enters at an angle of incidence in a transparent rod of material of refractive index μ. The light once entered into it will not leave it through its lateral face, whatsoever be the value of angle of incidence, if

A. $\mu > \sqrt{2}$

B. $\mu = 1$

C. $\mu = 1.1$

D. $\mu = 1.3.$

Watch Video Solution

194. Explain the formation of mirage.

A. total internal reflection of light

B. refractoin of light

C. Diffraction

D. dispersion

Watch Video Solution

195. Twinkling of stars is due to atmospheric:

A. total internal reflection

B. high dense matter of the star

C. consatnt burning of hydrogen in the star

D. the fluctuating apparent osition of the stare being slightly differnt from the actual position of the star.

Watch Video Solution

196. Twinkling of stars is due to atmospheric:

A. periodic bursts of light from the star

B. interfernece between light from the sun and star

C. partial absorption of light in the atmosphere

D. refractive index fluctujation in the atmoshphere

Watch Video Solution

197. A plano-convex lens is made of refractive index 1.6.If the radius of curvature of the curved surface is 60 cm,then focal length of the lens is:

A. 50 cm

B. 100 cm

C. 150 cm

D. 200 cm

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198. A convex lens becomes less converging when placed in

A. oil

B. water

C. both(A) and (B)

D. none of the above.

Watch Video Solution

199. An air bubble inside the water behaves as:

A. a convex lens

B. a concave lens.

C. a plano convex lens

D. a concave mirror.

Watch Video Solution

200. A lens behaves as a converging lens in air and diverging lens in water.The refractive index of the material of the lens is

A. equal to that of water

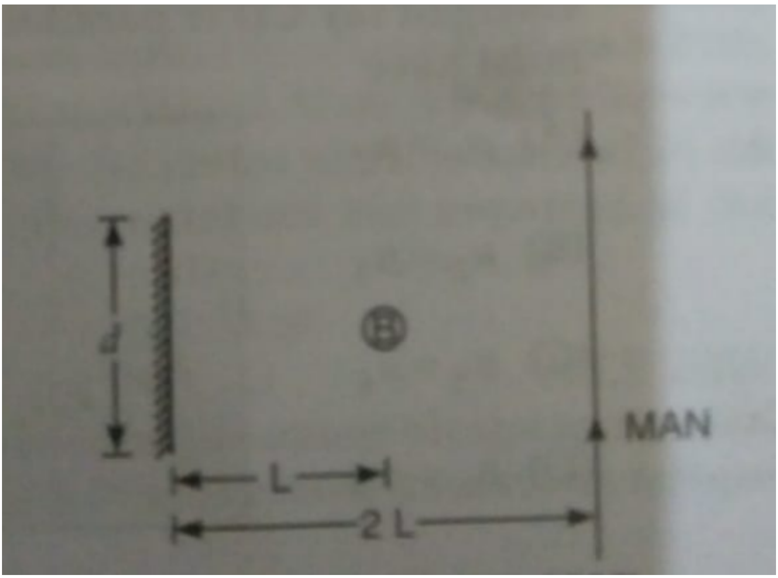
B. less than that of waer

C. greater than that of water

D. Nothing can be predicted.

Watch Video Solution

201. A point source of light B,placed in front of the centre of a mirror of width d,hangs vertically on a wall.A man walds in front of the mirror along a line parallel to the mirror at a distance 2L from it as shown in the figure.The gretest distance over which he can see the image of the light source in the mirror is



A. $d/2$

B. d

C. $3d$

D. $4d$.

Watch Video Solution

202. Two lenses have powers + 1 D and - 2 D respectively ,The power of combination si:

A. $+2D$

B. $-3D$

C. $-1D$

D. $+1D$.

Watch Video Solution

203. Two lenses having powers + 6 D and - 4D are placed in contact.The power of the combintin is

A. $-2D$

B. $-4D$

C. $+4D$

D. $+2D$

Watch Video Solution

204. An optical (eye specialist)prescibes spetacles is a pateint with a combination of a convex lens of focal length 40 cm nd concave lens 25 cm.The power of spectacles is:

A. $6.5D$

B. $1.5D$

C. $-6.67D$

D. $-1.5D$.

Watch Video Solution

205. The focal length of a convex lens is 30 cm and the size of image is quarter of the object.Them,the object distance is

A. 150 cm

B. 90 cm

C. 60 cm

D. 30 cm

Watch Video Solution

206. A screen is placed 80 cm from an object. The image of the object on the screen is formed by a convex lens placed between them at two different locations separated by a distance 20 cm. Determine the focal length of the lens.

A. D / a

B. D^2 / a^2

C. $\sqrt{D / a}$

D. $(D - a)^2 / (D + a)^2$.

Watch Video Solution

207. Which of the following pairs can produce erect,diminshed and virutual image?

A. Concave lens and convex mirror

B. Convex lens and convex irror

C. Convex lens and concave mirror

D. Concave lens and concave miror

Watch Video Solution

208. In order to obtain a real image of magnification 2 using a convergin lens of focal length 20 cm,where should an object be placed?

A. 50 cm

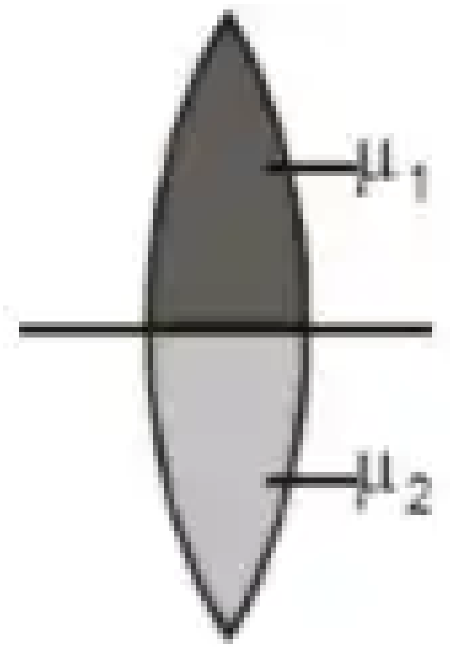
B. 30 cm

C. $-50cm$

D. $-30cm.$

Watch Video Solution

209. Which of the following is true for rays coming from infinity?



A. Conitnous image is formed between focal points of upper and lower parts of the lens

B. One image is formed

C. Two images are formed

D. None of the above.

Watch Video Solution

210. At what angle ,a ray of light will incident on one face of an equilateral prism,so that the emerget ray may graze the second surface of the prism(=1.5)?

A. 38°

B. 82°

C. 28°

D. 48°

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211. The blue colour of the sky is due to the phenomenon of

A. reflection

B. refraction

C. scattering

D. dispersion

Watch Video Solution

212. The sky appears blue, because.

A. red lgth is absorbed.

B. blue light is scattered the most

C. blue lugt is absored

D. it is its natural colour

Watch Video Solution

213. A red piece of paper when illuminated by green light appears:

A. red

B. yellow

C. black

D. white.

Watch Video Solution

214. White light is passed through a dilute solution of potasssium permagnate.The spectrum produced by the emergent light is

A. band emission spectrum

B. band emission spectrum

C. band absorption spectrum

D. line absorption spectrum.

Watch Video Solution

215. C.V. Raman received Nobel Prize for the discovery of the following phenomenon?

A. Theory of relativity

B. Law of gravitation

C. Neutron

D. Elastic scattering of light by molecules.

Watch Video Solution

216. C.V. Raman received Nobel Prize for the discovery of the following phenomenon?

A. Scattering

B. Diffraction

C. Interference

D. Polarisation

Watch Video Solution

217. The formation of rainbow in due to the phenomenon of

A. reflection

B. dispersion

C. refraction

D. interference,in which width of the fringe will be slightyly increased.

Watch Video Solution

218. If red light and violet light rays are of focal length f_r adn f_v then which one of the following is true?

A. $\lambda_r < \lambda_v$

B. $\lambda_r = \lambda_v$

C. $\mu_r > \mu_v$

D. $\mu_r < \mu_v$.

Watch Video Solution

219. A parallel beam of white ligth falls on a convex lens .Images of blue ,yellow nd red ligth are formed on the other side of the lens at distnaces 20 cm,20.5 cm and 21.4 cm respectively.The dispersive power of the material of the lens is

A. 0.0342

B. 0.0683

C. 0.0573

D. 0.0846.

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220. The dispersive powers of the materials of the two lenses are in the ratio $4:3$.If the combination of these two lenses is of focal length 60 cm,then the focal lengths of the component lenses are:

A. $+15cm$ and $-20cm$

B. $-15cm$ and $-20cm$

C. $+20cm$ and $-25cm$

D. $-20cm$ and $+25cm$.

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221. Retina of eye corresponds to which part of camera?

A. Film

B. Shutter

C. Aperture

D. lens

Watch Video Solution

222. The ability of eye-lens to adjust its focal length is called....... .

A. binocular vision

B. myopia

C. hypermeteria

D. accomodation.

Watch Video Solution

223. An astronomical telescope of ten fold angular magnification has a length of 44 cm.The focal length of the objective is

A. 4 cm

B. 40 cm

C. 44 cm

D. 440 cm

224. The magnifying power of telescope is high,if

A. both objective and eyepice have short focal lengths

B. both objective and eyepiece have long focal lengths

C. Objective has a long focal length

D. Objective has a hort focal length and eyepice has a long focal length.

Watch Video Solution

225. To increse magnifying power of telescope,we sould increase:

A. the focal length of the objective

B. the focal length of the eyepiece

C. aaperture of the objective

D. aperture of the eyepiece.

Watch Video Solution

226. A telescope has focal elngth of objective and eyepiece as 200 cm and 5 cm respectively.what is magnification of telescope?

A. 40

B. 80

C. 50

D. 0.01.

Watch Video Solution

227. If size of aperture is decreased,

A. intensity of image is decreased

B. no effect on the formation of image

C. any of the above

D. none of the above

Watch Video Solution

228. The objective with large aperture are used in telescope for

A. ease of manufaturer

B. reducing lens aberration

C. grerater resulution limit

D. bright image

Watch Video Solution

229. If in Rmsden's eyepiece,the field lenses have focal lengths f_1 and f_2 respecrtively and separted by a distance d,then

A. $f_1 = f_2$ and $d = f_1 + f_2$

B. $f_1 = f_2$ and $d = 2f_1/3$

C. $f_1 = 3f_2$ and $d = f_1 + f_2$

D. $f_1 = 2f_2/3$ and $d = 2f_1/3$.

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230. Huygens' wave theory allows us to know:

A. the wavelength of the wave

B. the velocit of the wave.

C. the amplitude of the wave

D. the propagation of wavefronts

Watch Video Solution

231. Which of the following does not support the wave nature of light?

A. interference

B. diffraction

C. polarisation

D. photoelectric effect.

Watch Video Solution

232. Huygen's wave theory of light could not explain

A. photoelectric effect

B. polarisation

C. Diffraction

D. interference

Watch Video Solution

233. Hiygens' concept of secondary waves

A. allows us to find the focal length of a thick l ens

B. is a geometerical method to find a wave front

C. is used to explain polarisation

D. is used to determine the velocity of light.

Watch Video Solution

234. In the ineterference pattern,the energy is

A. created at the maximum

B. destroyed at the minimum

C. conserved and redistributed

D. All of the above.

Watch Video Solution

235. Two waves of the same equency and intenisty superimpose with each other in opposite phases .After the superposition,the

A. intensity increases y 4 times

B. intensity increases by 2 tiems

C. frequncy increases bby 4 times

D. none of these.

Watch Video Solution

236. Two waves,whose inensitites re 9:16 are made to inrterefere.The ratio of maximum and minmum intensities in the inerference pattern is:

A. $49 : 1$

B. $25 : 7$

C. $10 : 9$

D. $4 : 3.$

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237. Two waves have intenstities in the ratio of $1:9$.If these waves produce intererence,then the ratio of maximum nd minimum intensiteites is

A. $3:1$

B. $4:1$

C. $9:1$

D. $16:1$.

Watch Video Solution

238. When ligh wave suffers reflection at the interface between air and glass,the chanfge of phase of the refleced wave is equal to

A. zero

B. $\pi/2$

C. π

D. 2π.

Watch Video Solution

239. Two sources of light of wavelenghs $2.500\overset{\circ}{A}$ and $3,500 overst \circ A$ are used in Young's double slit experiment simultaneously.which order s of the fringes of two waelength paterns coincide?

A. Third order of irst source and fifthe order of second.

B. Seventh order of first source and fifth order of second

C. Fifth order of first source and thrid order of second

D. Fifthe order of first source and seveneth order of second.

Watch Video Solution

240. In Yound's double slit experiment,wer get 15 fringes per cm on the screen,while using light of wavelength $5,600\overset{\circ}{A}$ (sodium lamp).How many fringes per cm we get with ligth of wavelength $7,000\mathring{A}$?

A. 18

B. 15

C. 12

D. 10

Watch Video Solution

241. If white light is used in the Newton's ring s experiment ,the color observed in the reflected light is complementary to that observed in the transmitted light through the same point. This is due to

A. 45° change of phase is one of the reflected waves

B. 90° change of phase in one of the reflected waves

C. 135° change of phase in one of the reflected waves

D. 180° change of phase in one of the reflected waves.

Watch Video Solution

242. Why does the colour of the oil fim on the surface of water continously change?

A. Angle of incidence

B. angle of reflection

C. thickness of film

D. none of the above.

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243. Bending of light into regoins of geometrical shadow is called:

A. devaition

B. dispersion

C. polarisation

D. diffraction

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244. The width of the difraction band varies

A. inversely as the wavelength

B. diretly as the width of the slit

C. directly as the distance between slits and the screen

D. inversely as the size of the source from which ,the slit is illuminated.

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245. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1.00 mm wide and the resulting diffraction pattern

is observed on a screen 2m away. What is the distance between the first dark fringes on either side of the central fringe?

A. 1.2 mm

B. 2.4 mm

C. 1.2 cm

D. 2.4 cm

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246. A paper,with two marks havin separation d,is held normal to the line of sight of an observer at a distance of 50 m.The diamerter of the eye len of he obeserver is 2 mm.the least value of d,so that the marks can be seen as seaarte,will be (The mean wavelength of visible light may be taken as 5000 A)

A. 2.125 cm

B. 12.5 cm

C. 0.125 cm

D. 1.225 cm

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247. The diameter of the objective lens of the telescoe is 5 m and waveelnegth of light is $6,000\overset{\circ}{A}$.The limit of resolution of this telescope is:

A. $0.15' '$

B. $0.06' '$

C. $0.03''$

D. $30.03''$.

Watch Video Solution

248. Diameter of human eye lens is 2 mm.What will be the minimum distance between two points to resolve them,which are situated at a distacne of 50 m from eye?The wavleength of ligth is $5,000\overset{\circ}{A}$.

A. 2.32 mm

B. 4.28 mm

C. 1.525 cm`

D. 12.48 cm

Watch Video Solution

249. The fact that ligth is a transverse wave in nature derives irts evidence by the support from the observation that:

A. light waves undergo reflection

B. light can be diffracted

C. light travels in waves

D. light shows polarising effects.

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250. Light waves are transverse, because they:

A. get olarised

B. do ot get polarised

C. get reflected

D. get refracted.

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251. Which one proves transverse nature of waves?

A. Polarisation

B. Diffraction

C. Interfernece

D. All of these

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252. Which of the following phenomenon shows the transverse nature of light?

A. photoelectric effect

B. interference

C. polarisation

D. diffraction

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253. Which one of the following statement is true?

A. Both light and sound waves can travel in vacuum.

B. The sound waves in air are longitudeinal,while light waves are transverse

C. Both lght and sound waves in air are longitudinal

D. Both light and sound waves can travel in vacuum.

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254. Which one of the following does not show polarisation?

A. Transverse waves

B. Longitudinal wave

C. Both (A) and (B)

D. None of the above

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255. Refractive index of a maerial is equal to tangent of polarising angle.It is called

A. Brewster's law

B. Lambrt's law

C. Malus law

D. Bragg's law

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256. Polarised light can be produced by

A. dispersion

B. scattering

C. interference

D. diffration

Watch Video Solution

257. An unpolarised beam of light of intensity I_0 is incident on a combination of two polaroids.Find the net intesity of light of intensity transmitted by the combinatin,when the pass axis of the two polaroids are inclined to each other at an angle of 60°.

A. I_0

B. $I - 0/2$

C. $I_0/4$

D. $I_0/8$.

Watch Video Solution

258. A ray of ligth is incidentt on a glas plate at an angle of 60°.What wouldd be the

refractive index of glss,if refleted nd refracted rays are prependicular to each other?

A. $\sqrt{3}$

B. $3/2$

C. $\sqrt{3}/2$

D. $1/2$.

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259. Light from a denser medium I goes to a rarer medium II.When angle of incidence is θ ,the reflected and refraced ray s are perpenciculat to each other .The crtitical angle is:

A. $\sin^{-1}(\cos\theta)$

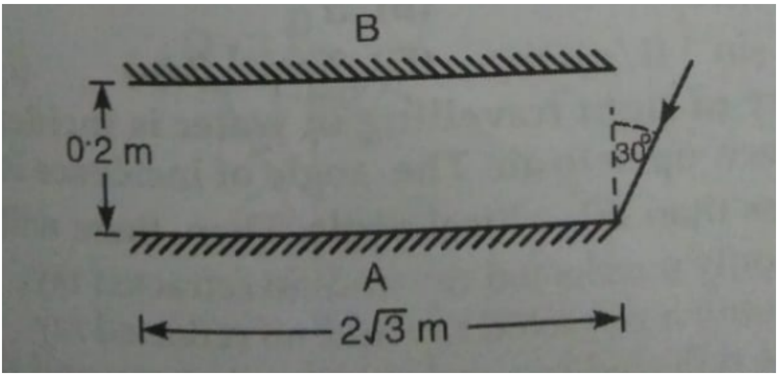
B. $\sin^{-1}(\cot\theta)$

C. $\sin^{-1}(\tan\theta)$

D. $\sin^{-1}(1)$.

Watch Video Solution

260. Two plane mirrors A and B are aligned parallel to each other ,as shown in the figure.A light ray is incident at an angle 30° at a point just inside one end of A.The plane of incidence coincides with the plane of the figure.



The maximum number of times the ray

undergors reflections(including the first one,before it emerges out is

A. 28

B. 30

C. 32

D. 34

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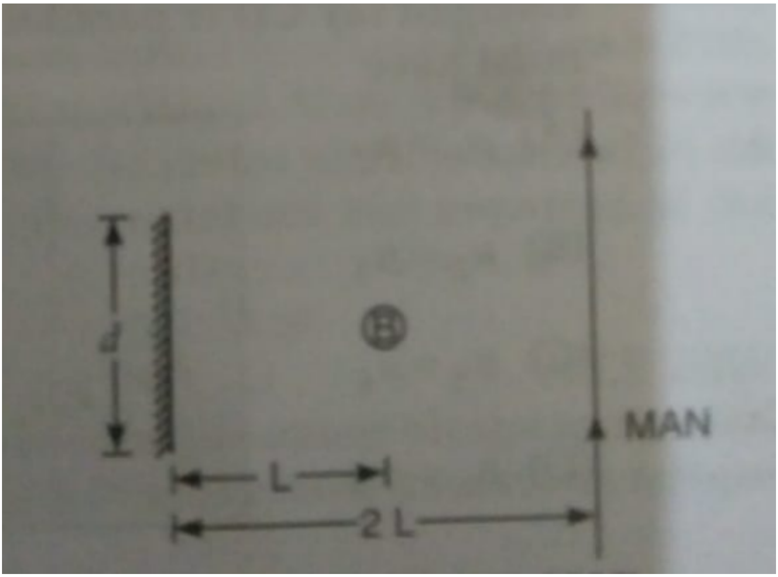
261. A point source of light B,placed in front of the centre of a mirror of width d,hangs vertically on a wall.A man walds in front of the mirror along a line parallel to the mirror at a distance 2L from it as shown in the figure.The gretest distance over which he can see the image of the light source in the mirror is



A. $d/2$

B. d

C. 2d

D. 3d

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262. A student performed the experiment of determining the focal length of a concave mirror by u-v method using an concave mirror used is 24 cm.The maximum error in the location of of the image can be 0.2 cm.The 5 sets of (u,v) values redcorded by the student in cm are :(42,56),(48,48),(60,40),(66,33), (78,39).The data set(s) that cannot come from experiment and is (are) incorrectly recorded is (are)

A. `(42,56)

B. (48,48)

C. (66,33)

D. (78,39)

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263. A concave mirror s placed on a horizontal table with its axis directed vertically upwards.Let O be the pole of the mirror canc C its centre of curvature.A point object is placed at C.It has a real image ,also located at C.If the mirror is now filled with water ,the image will be:

A. real and will remain at C

B. real and located at a point between C and infinity.

C. virtual and located at a point between C and O.

D. real and located at a point between C and F.

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264. In an experiment to determine the focal length (f) of a concave mirror by the u-v method, a student places the object pin A on the principal axis at a distance x from the pole P. The student looks at the pin and its inverted image from a distance keeping his/her eye in line with PA. When the student shifts his/her eye towards left, the image appears to the right of the object pin. Then,

A. $x < f$

B. $f < x < 2f$

C. $x = 2f$

D. $x > 2$

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265. A container is filled with water $(\mu = 1.33)$ upto a height of 33.25 cm .a concave miror is placed 15 cm above the water level and the image of an object placed at the bottom is formed 25 cm below the water leverl[Fig.2.90].Find the focal length of the concave mirror.

A. 10 cm

B. 15 cm

C. 20 cm

D. 25 cm

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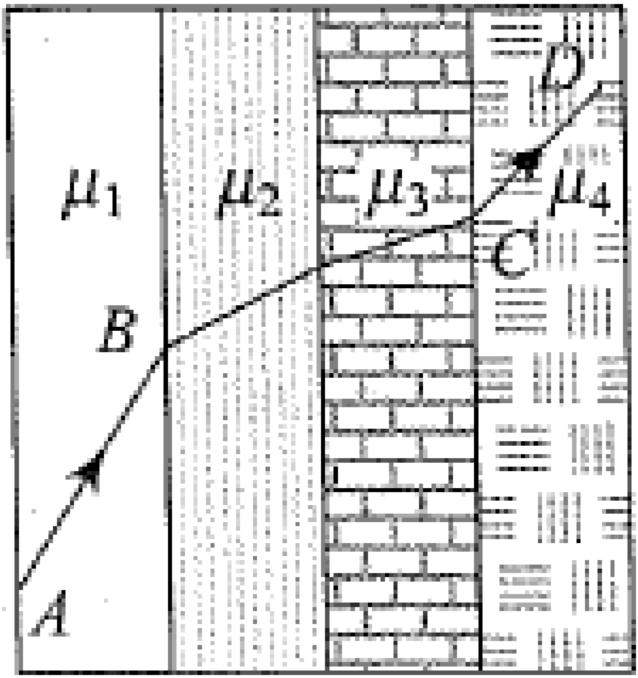
266. A ray of light passes through four transparent media with refractive indices $\mu_1, \mu_2, \mu_3,$ and $\mu_4$as shown in figure. The surfaces of all media are paralle. If the emerent ray CD is parallel to the incident ray

AB, we must have



A. $\mu_1 = \mu_2$

B. $\mu_2 = \mu_3$

C. $\mu_3 = \mu_4$

D. $\mu_4 = \mu_1$.

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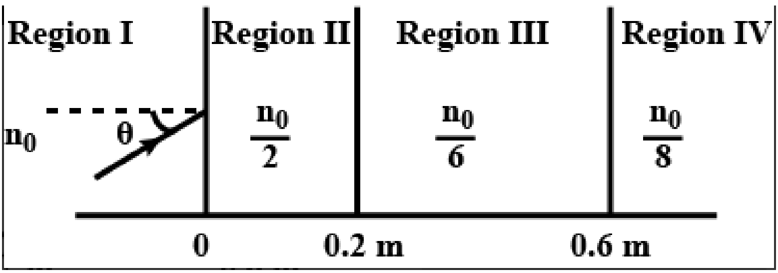
267. A light beam is travelling from Region I to IV (figure). The refractive index in regionals I,II,III and IV are $n_0 = \frac{n_0}{2}\frac{n_0}{6}$ and $\frac{n_0}{8}$ respectively. The angle of incidence theta for which the beam just misses entering region IV is-



A. $\sin^{-1}(1/8)$

B. $\sin^{-1}(1/4)$

C. $\sin^{-1}(1/3)$

D. $\sin^{-1}(3/4)$

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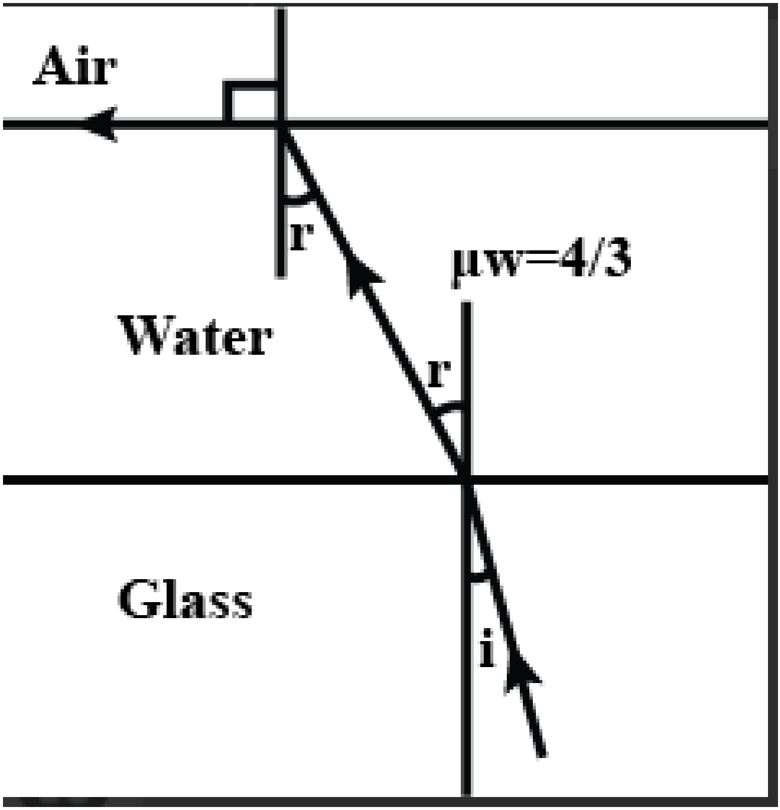
268. A ray of light is incident at the glass-water interface at an angle i. It merges finally parallel to the surface of the water. Then, the value of

$\mu_g$would be(where $\mu_g$is the refractive index of glass with respect to water)



A. $(4/3)\sin i$

B. $1/\sin i$

C. $\frac{4}{3}$

D. 1

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269. A ray of light travelling in a transparent medium of refractie index μ falls on a surface separatign the medium from air at an angle of incidence of 45°.For which of the following velues of μ,the ray can indergo total internal reflection?

A. 1.3

B. 1.4

C. 1.525 cm`

D. 1.6

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270. A beam of light is converging towards a point on a screen.A plane parallel plate of glass is introduced in the path of this converging beam.How will the point of convergence be shited ?Draw the ray diagram.

A. $t\left(1-\frac{1}{\mu}\right)$

B. $t\left(1+\frac{1}{\mu}\right)$

C. $t\left(1-\frac{1}{\mu}\right)$

D. $t\left(1+\frac{1}{\mu}\right)$

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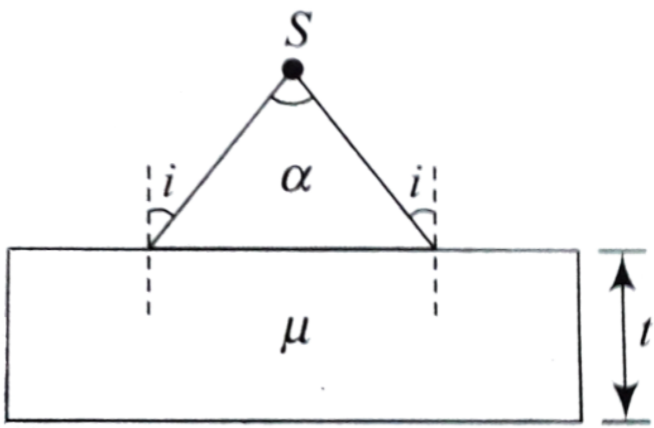
271. A diverging beam of light from a point source S having divergence angle α, falls symmetrically on a glass slab as shown. The angles of incidence of the two extreme rays are equal. If the thickness of the glass slab is t and the refractive index n, then the divergence angle of the emergent beam is



A. zero

B. α

C. $\sin^{-1}(1/\mu)$

D. $2\sin^{-1}(1/\mu)$

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272. A ray of light travelling in water is incident on its surface open to air.The angle of incidence is θ,which is less than the critical angle .Then,there will be

A. only a reflected ray and no refracted ray.

B. only a refracted ray and no reflected ray.

C. a reflected ray and a refracted ray and the angle between them would be less than $180^\circ - 2\theta$.

D. a reflected ray and a refracted ray and the angle between them would be greater than $180^\circ - 2\theta$.

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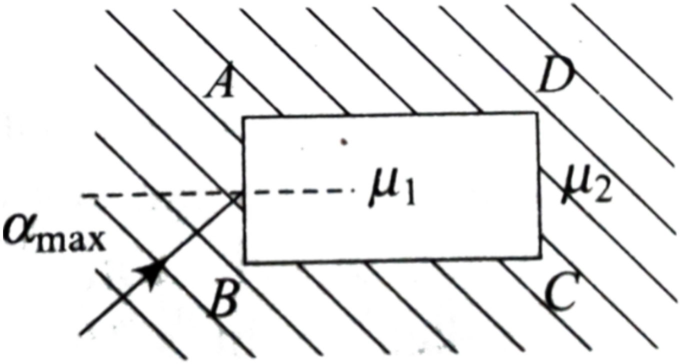
273. A rectangular glass slab ABCD of refractive index n_1 is immersed in water of refractive index $n2(n1 < n2)$. A ray of light is incident at the surface AB of the slab as shwon. The maximum value of the angle of incidence αmax such that the ray comes out from the other surface CD is given by



.

A. $\sin^{-1}\left[\frac{\mu_1}{\mu_2}\cos\left(\frac{\sin^{-1}(\mu_2)}{\mu_1}\right)\right]$

B. $\sin^{-1}\left[\mu_1\cos\left(\frac{\sin^{-1}1}{\mu_2}\right)\right]$

C. $sn^{-1}\frac{\mu_1}{\mu_2}$

D. $\frac{\sin^{-1}(\mu_2)}{\mu_1}$.

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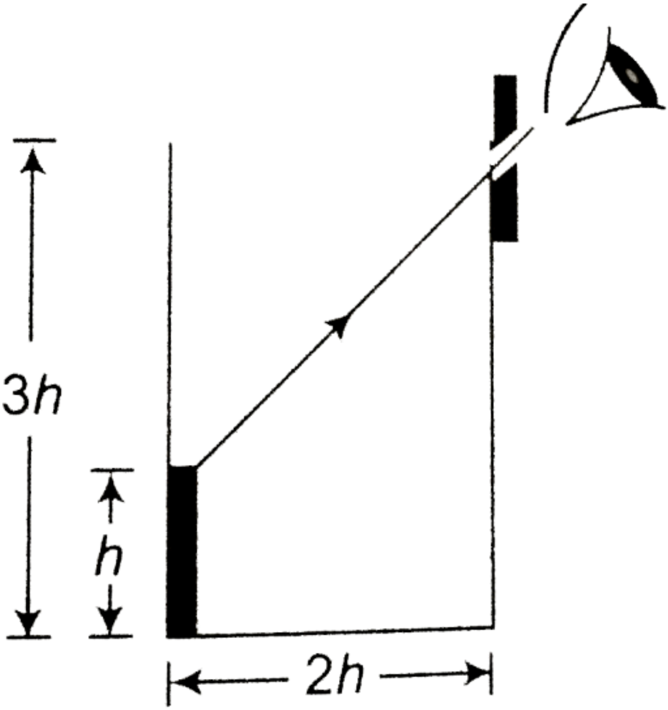
274. An observer can see through a pin-hole the top end of a thin rod of height h, placed as shown in the figure. The height of beaker is 3h and its radius is h. When the beaker is filled with a liquid up to a height 2h, he can see the lower end of the rod. Then the refractive index of the liquid is



A. $5/2$

B. $\sqrt{5/2}$

C. $\sqrt{3/2}$

D. $3/2$.

Watch Video Solution

275. Two beams of red and violet colours re mde to pass separaterly through a prism (angle of prism is 60°).In the position of minimum deviation,the angle of refraction will be

A. 30° for both the colours

B. greater for the violet colour

C. greater for the red colour

D. equal but not 30° for both the colours.

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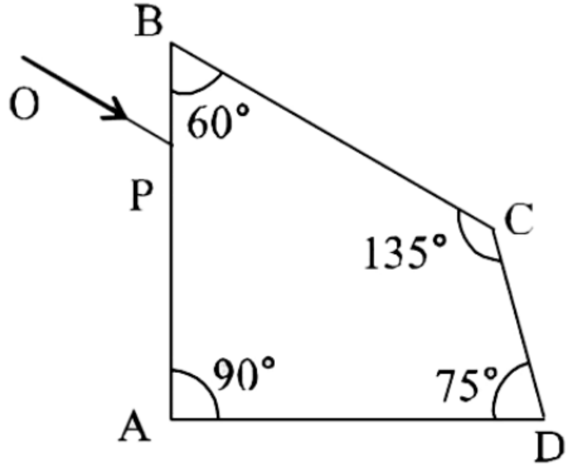
276. A ray OP of monochromatic light is incident on the face AB of prism ABCD mear vertex B at an incident angle of 60° (see figure). If the refractive index of the material of the prism is $\sqrt{3}$, which of the following is (are)

are correct?



A. The ray gets totally iunternally reflected at the face CD

B. The ray comes out through face AD.

C. The angle between the the incident ray and the emergent ray is 90°

D. The angle between the incident ray and the emergent ray is 120°.

Watch Video Solution

277. Which of the following forms (s) a virtual and erect image fo all positions of the object?

A. convex lens

B. concave lens

C. convex mirror

D. concave mirror.

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278. A spherical surface radius of curvatue R seprates air (refractive index 1.0) from glass 9refractive index 1.5).The centre of curvature is in the glass.A point object P is placed in air is found to have a real image Q in the glass.The line PQ cuts the surface at a point O and PO = OQ[Fig.2.47].Find the distance of object from the shperical surface.

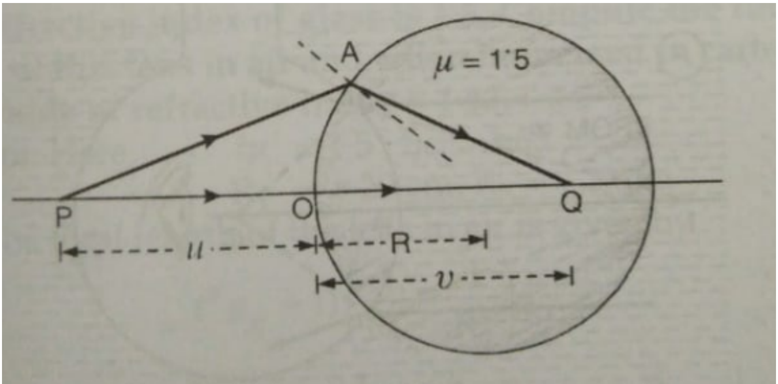

Fig. 2.47

A. 5R

B. 3R

C. 2R

D. 1.5R

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279. A point object is placed at the centre of a glass sphere of radius 6 cm and refractive index 1.5.The distance of the virtual image from the surface of the sphere is

A. 2 cm

B. 4 cm

C. 6 cm

D. 12 cm

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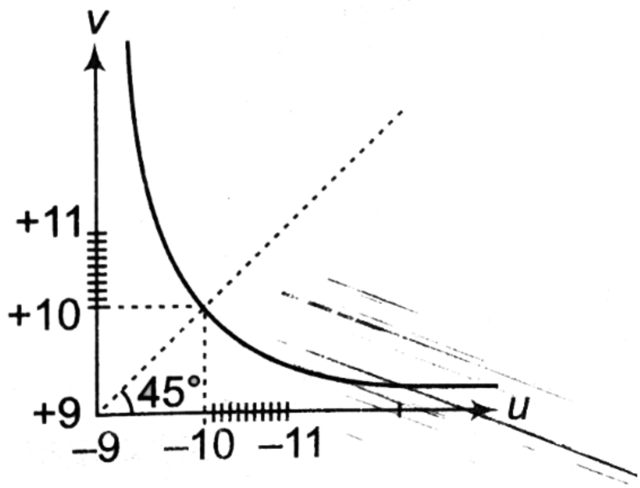
280. The graph between object distance u and image distance v for a lens is given below. The focal length of the lens is.



A. 5 ± 0.1

B. 5 ± 0.05

C. 0.5 ± 0.1

D. 0.5 ± 0.05

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281. A convex lens A of focal length 20 cm and a concave lens B of focal length 5 cm are kept along the same axis with a distance d between them. If a parallel beam of light falling on A and B as a parallel beam, then d is equal to ...... cm

A. 25

B. 15

C. 30

D. 50

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282. The size of the image of an object,which is at infinity, as formed by a convex lens of focal length 30 cm is 2 cm. If a concave lens of focal length 20 cm is placed between the convex lens and the image at a distance of 26 cm from the convex lens, calculate the new size of the image

A. 1.25 cm

B. 2.5 cm

C. 1.05 cm

D. 2 cm

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283. A convergeing lens is used to form an image on a screen.When the upper half of the lens is converd by an opaque screen,

A. half the image will disappear

B. comoplete image will be formed

C. intensity of image will decrease

D. intensity of image will increase.

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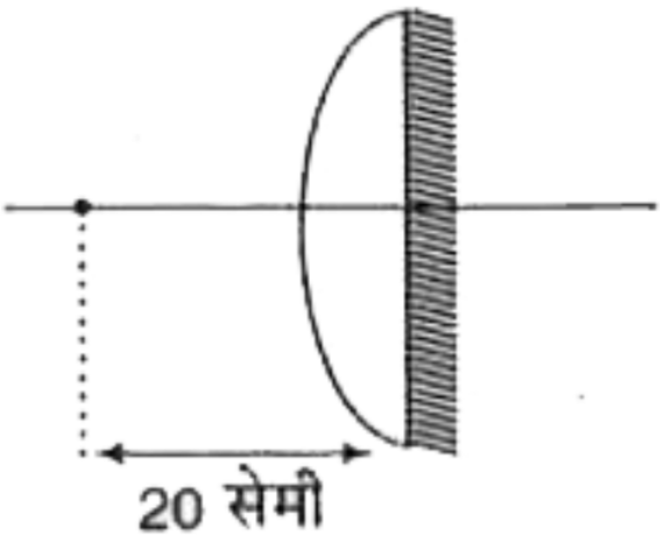
284. A point object is placed at a distance of 20 cmA point object is placed at distance of 20cm from a thin plano convex lens of focal length 15cm.The plane surface of the lens is now silvered. The image created by the system is at



A. 60 cm to the left of the system.

B. 60 cm to the right of the system

C. 12 cm to the left of the system.

D. 12 cm to the rigth of the system.

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285. A biconvex lens of focal length 15 cm is in front of a plane mirror.The distnace betweent the lens and the mirror is 10 cm.A small object is kept at a distance of 30 cm from the lens

.The final image is

A. virtual and at a distance of 16 cm from the mirror

B. real and at a distance of 16 cm from the mirror

C. virtual and at a distance of 20 cm from the mirror

D. real and a distance of 16 cm from the mirror.

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286. A concave lens of glass, refractive index 1.5 ,has both surfaces of the same radius of curvature R. On immersion in a medium of refractive index 1.75, it will behave as

A. convergent lens of focal length 3.05R.

B. convergent lens of focal length 3.0 R

C. divergent lens of focal length 3.5 R.

D. divergent lens of focal length 3.0R.

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287. A double convex lens made from a material of refractive index μ_1 is immersed in a liquid of refactive index μ_2 where$\mu_2 > \mu_1$. What change, if any, would occur in the nature of the lens?

A. diverging lens,if$\mu_1 > \mu_2$.

B. diverging lens,if$\mu_1 < \mu_2$

C. converging lens,if$\mu_1 > \mu_2$

D. converging lens, if $\mu_1 < \mu_2$.

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

A. $-75, 50$

B. $-10, 15$

C. $75, 50$

D. $-15, 10.$

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289. A hollow doublew concave lens is made of very thin transparent material.It can be filled with air ofr either of two liquids L_1 and L_2

having refractive indices μ_1 and μ_2 respectively $(\mu_2 > \mu_1 > 1)$.The lens will diverge a parallel beam of light,if it is filled with

A. air and placed in air

B. air and immersd in L_1

C. L_1 and immersed in L_2

D. L_2 and immersed in L_1.

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290. A biconvex of focal length forms a circular image of radius r of sun in focal plane.Then,which option is correct?

A. $\pi r^2 00 f^2$

B. $\pi r^2 00 f^2$

C. If lower half part is covered by blasck sheet,then area of the image is $\pi r^2 / 2$.

D. If f is doubled ,intensity will increase.

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291. A real image of a distant object is formed by a plano-convex lens on its principal axis .Spherical abbretion

A. is absent

B. is smaller,if the curved surface of the lens faces the object

C. is smaller,if the plane surface of the lens faces the object

D. is the sme,whichever side of the lens faces the obbject.

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292. A ray of light passes through an equilateral glass prism,such that angle of incidence is equal to the angle of emergence.If the angle of emergence is $3/4$ times the angle of prism,calculate the refractive index of the glass prism.

A. 45^@`

B. 39°

C. 20°

D. 30°.

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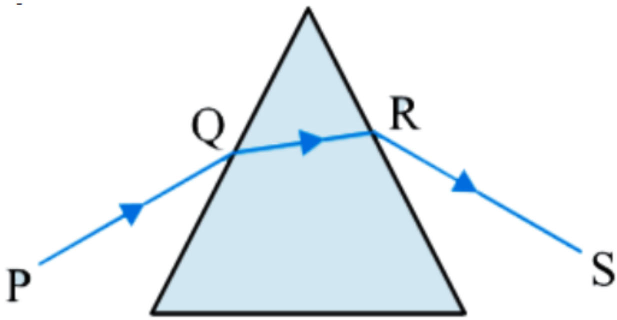
293. A ray of light is incident on an equilateral glass prism placed on a horizontal table.For minimum deviation,which of the follosing is true?



A. PQ is horizontal

B. QR is horizontal

C. RS is horizontal

D. Either PQ or RS is horizontal

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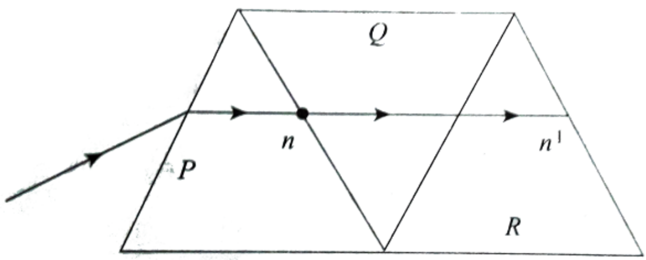
294. A given ray of light suffers minimum deviation in an equilateral prism P. Additional prism Q and R of identical shape and of the same material as P are now added as shown in figure. The ray will now suffer



A. greater deviation

B. no deviation

C. same deviation as before

D. total internal reflection

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295. A thin prism of angle 15° made of glass of refractive index = 1.5 is combined with another prism of glass of refractive index = 1.75 .The combination of prism produces dispersion without deviation.The angle of the second prism should be

A. 5.33°

B. 4°

C. 3°

D. 2.6°.

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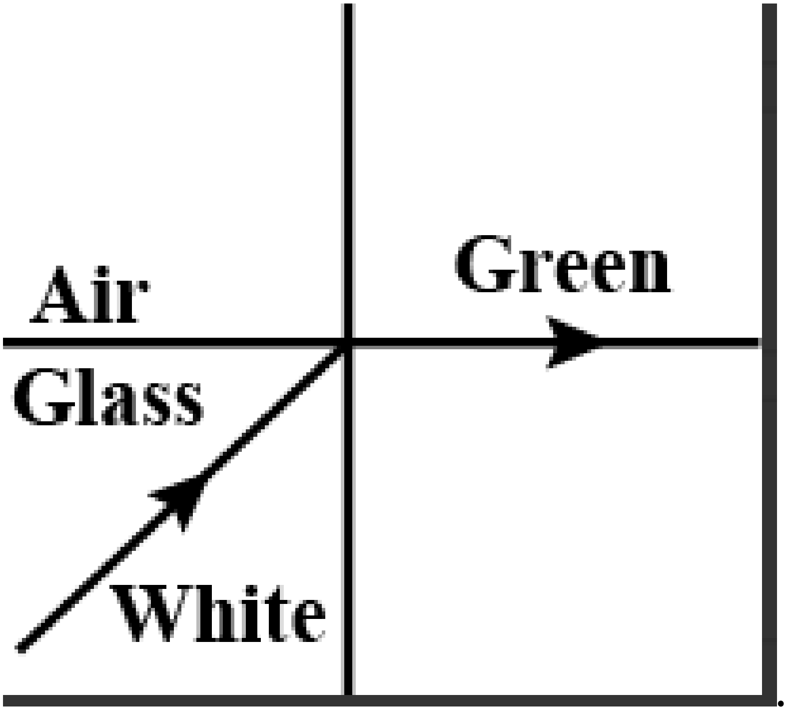
296. White ligth is incident on the interface of glass and air as shown in the figure.If green light is just totally internally reflected,then the emerging ray in air contains.



A. yellow,orange,red

B. violet,indigo,blue

C. all colours

D. all colours except green

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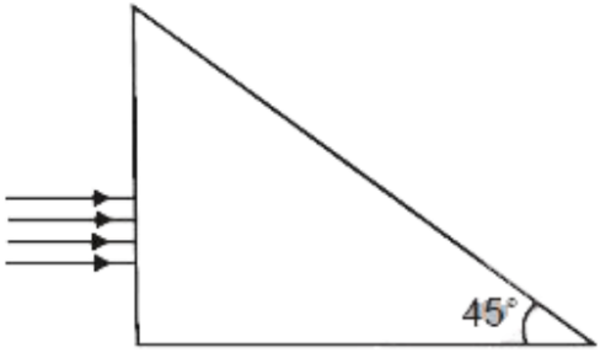
297. A beam of light consisting of red, green and blue and is incident on a right angled prism. The refractive index of the material of the prism for the above red, green and blue wavelengths are 1.39, 1.44 and 1.47 respectively.

The prism will :



A. seprate part of the red colour from the green and blue colours.

B. separate part of the blue colour from the red and green colours

C. separate all the three colours from one another.

D. not separate even partially any colour from the other two colors.

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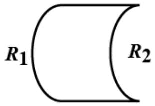
298. Which one of the following spherical lenses does not exhibit dispersion?The radii of curvature of the surfaces of the lenses are as given in the figure.

A.

A 

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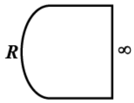
B.

B 

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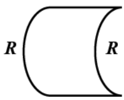
C.

C 

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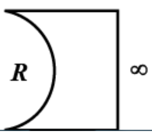
D.

D 

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299. In a compound microscope,the intermediate image is

A. virrtual,erect and magnified

B. real,erect and magnified

C. real,inverted and magnified

D. virtual,erect and reduced.

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300. The focal length of the objective of a microscope is

A. greater than the focal length of the eye-piece

B. less than the focal elngth of the eye-piece

C. equal to focal length of the eye-piece

D. arbitary.

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301. When the length of a microscope tube is increased,its magnifying power

A. decreases

B. increases

C. does not change

D. cannot be predicted.

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302. The 'f number' of a given camera is 8.It means that

A. the diamater of the stop of the camera is 0.08 m.

B. the focal length of the lens of the camera is 8.0 m.

C. the diameter of the stop is 0.125 of the focal length of the lens

D. none of the above.

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303. The interfernce phenomenon can take place

A. in all waves

B. in transverse waves only

C. in longitudinal waves only

D. in standing waves only

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304. Two waves of intensities I and 4 I superimpose, then maximum and minimum intensities are:

A. 5 I and I

B. 9 I and I

C. 5 I and 3 I

D. 9 I and 3 I.

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305. Two beams of light having intensities I and 4 I interfere to produce a fringe pattern on a screen.The phase difference between the beams is $\pi/2$ at point A and π at point B.Then the differnece between the resultant intensities at A and B is

A. 2I

B. 4 I

C. 5 I and 3 I

D. 7 I

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306. The contrast in the fringes in any interference pattern depends on

A. fringe width

B. wavelength

C. intensity ratio of the sources

D. distance btween the slits.

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307. For constructive interfrence to take place between two monochromatic light waves of wavelength λ,the path difference should be

A. $(2n-1)\lambda/4$

B. $(2n-1)\lambda/2$

C. $n\lambda$

D. $(2n+1)\lambda/2$.

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308. In Young's double slit experiment,the sepaation between the slit is halved and distance between the slits and screen is doubled.The fringe width is

A. unchanged

B. halved

C. doubled

D. quadrupled.

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309. In a Young's double slit experiment,12 fringes are observed to be formed in a certain segment of the screen,when light of wavelength 600 nm is used.If the wavelength of light is changed to 400 nm ,number of fringes observed in the same segment of the screen is given by

A. 12

B. 18

C. 24

D. 30

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310. In the Young's double slit experiment,the interference pattern is found to have an intensity ratio between brigth and dark fringe as 9.This i mplies that

A. the intensities at the screen due to two slits are 5 units and 4 units respectiely.

B. the inensities at the screen due to slits are 4 units and 1 unit respectively

C. th amplitude ratio is 3.

D. the amplitude ratio is 2.

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311. in a double slit experiment,instead of taking slits of equal widths,one lit is made twice as wide as the other.Then,in the interference pattern,

A. the intensities of both the maxim nd the minima increase

B. the intenstities of the maxima increases and the minima has zero intensity

C. the intensity of the maxima decreases and that of the minima increases

D. the intensity of the maxima decreases and the minima has zero intensity.

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312. In a Young's double slit experiment,the separation betwen the two slits is d and the wavelength of the light is λ.The intensity of light falling on the slit 1 is four times the intesntiy of light falling on slit 2.Choose the correct choice(s).

A. If $d = \lambda$, the screen will contain only one maximum.

B. If $\lambda < d < 2\lambda$ at least one more maximum (besides the central maximum) will be observed on the screen.

C. If the intensity of light falling on slit 1 is reduced so that it becomes equal to that of slit 2, the intensities of the observed dark and bright fringes will increase.

D. If the intensity of light falling on slit 2 is increased so that it becomes equal to that of slit 1, the intensities of the observed dark and bright fringes will increase.

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313. in a Youing's double slit experiment,bicromatic light of wavelengths

400 nm and 560 nm are used.The distance between the slits is 0.1 mm and the distance between the plane of the slits and screen is 1.0m. the minimum distance between two successive regions of complete darkness is

A. 4 mm

B. 5.6 mm

C. 14 mm

D. 28 mm

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314. In a two-slit experiment with monochromatic light, fringes are obtained on the screen placed at some distance form the slits. If the screen is moved by $5 \times 10^{-2} m$ towards the slits, the change in fringe width is $3 \times 10^{-5} m$. If the distance between the slits is $10^{-3} m$, calculate the wavelength of the light band.

A. $6, 000 \overset{\circ}{A}$

B. $5, 000 \overset{\circ}{A}$

C. $3,000\overset{\circ}{A}$

D. $4,500\overset{\circ}{A}$.

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315. In an ideal double slit experiment when a glass plate having refractive index 1.5 and thickness t is placed in the path of interfered light rays of wavelength λ then the intensity remains unchanged at the place where the central maximum was previously formed. Then the minimum thickness of the glass plate is

A. 2λ

B. $2\lambda/3$

C. $\lambda/3$

D. λ.

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316. A beam of electrons is used in an Young's double slit experiment.The slit width is d.When the velocity of electrons is increased,then

A. no interference is observed

B. fringe width incrases

C. fringe width decreases

D. fringe width remain same.

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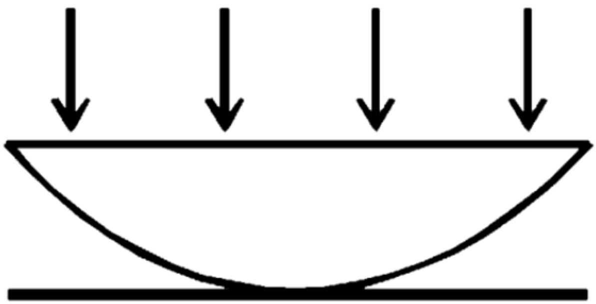
317. A thin slice is cut out of a glass cylinder along a plane parallel to its axis.The slice is placed on a flat glass plate as shown in figure.The observed interference fringes from this combination shall be



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A. straight

B. circular

C. equally spaced

D. having fringe spacing ,which increases as wego outwards.

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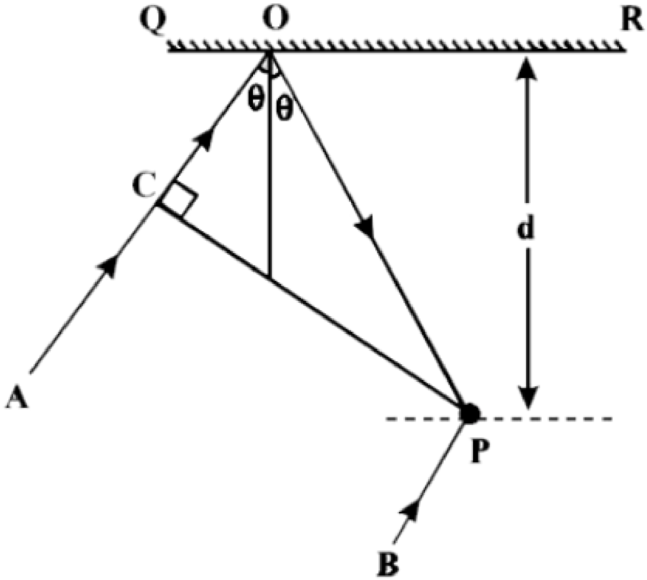
318. In the adjacent diagram, CP represents a wavefront and AO & BP, the corresponding two rays. Find the condition on theta for constructive interference at P between the ray

BP and reflected ray OP.



A. $\cos\theta = 3\lambda / 2d$

B. $\cos\theta = \lambda / 4d$

C. $\sec\theta - \cos\theta = \lambda / d$

D. $\sec\theta - \cos\theta = 4\lambda / d$

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319. Yellow light is used in a single slit diffraction experiment with slit width of 0.6 mm. If yellow light is replaced by X-rays, how will the diffraction pattern be affected?

A. that the central maximum is narrower

B. more number of fringes

C. less number of fringes

D. no diffraction patter

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320. A parallel monochromatic beam of light is incident normally on a narrow slit.A diffraction pattern is formed on a screen placed perpendicular to the direction of the incident beam.At the first minimum of the diffraction pattern,the phase difference between the rays coming from the two edges of the slit is

A. 0

B. $\pi / 2$

C. π

D. 2π

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321. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1.00 mm wide and the resulting diffraction pattern is observed on a screen 2m away. What is the distance between the first dark fringes on either side of the central fringe?

A. 1.2 cm

B. 1.2mm

C. 2.4 cm

D. 2.4 mm

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322. A ray of light from a rarer medium strikes a denser medium.

The reflected and refracted rays make an angle of 90° with each other .the angles of reflection and refraction are r and r' .The critical angle would be

A. $\sin^{-1}(\tan r)$

B. $\sin^{-1}(\tan i)$

C. $\sin^{-1}(\tan r')$

D. $\tan^{-1}(\sin i)$

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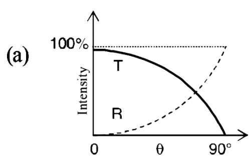
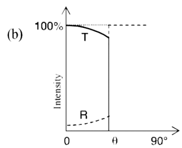
323. A light ray travelling in glass medium is incident on glass-air interface at an angle of incidence θ.The reflected (R) and transmitted (T) intensitties,both as function of θ,are plotted.The correct sktech is

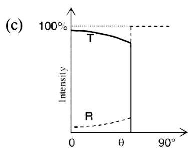
A.



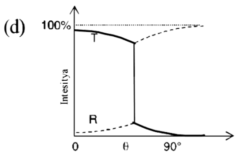
B.



C.



D.



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324. A ray of light is reflected at angle 30°.If the angle of incidence becomes double,then angle of reflection will be

A. 90°

B. 60°

C. 45°

D. 30°.

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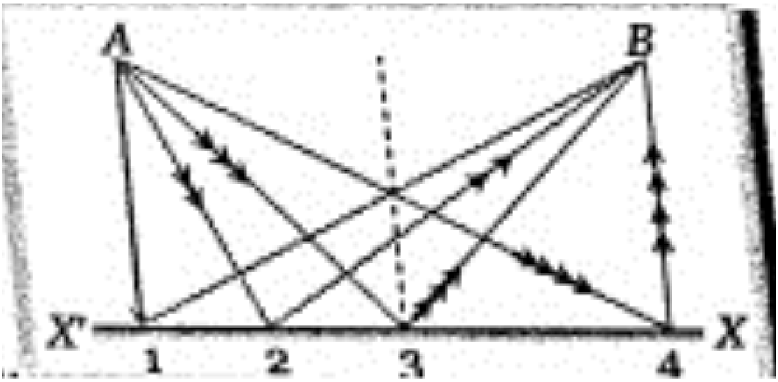
325. A ray of light travels from the point A to B with a uniform speed.On its way,it is reflected by the surface XX' .The path followed by the ray to take least time is



A. 1

B. 2

C. 3

D. 4

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326. 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. $+12ms^{-1}$

B. $+6ms^{-1}$

C. $-6ms^{-1}$

D. $-12ms^{-1}$.

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327. A square wire of side 3 cm is placed 25 cm away from a concave mirror of focal length 10 c.What is the area enclosed by the imge of the wire?(The entre of the wire is on teh axis of he mirror,with its two sides normal to he axis).

A. $4.0cm^2$

B. $9.0cm^2$

C. $4.5cm^2$

D. $20.25cm^2$.

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328. If a concave mirror of focal length f produces a real image n times the size of the object,then find the distance of the object from the mirror.

A. $(m-1)f/m$

B. $(m+1)f/m$

C. $(m-1)f$

D. $(m+1)f$.

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329. A concave mirror of focal length f (in air) is immersed in water $(\mu = 4/3)$.The focal length of the mirror in water will be

A. f

B. $4f/3$

C. $3f/4$

D. none of the above

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330. A convex mirror of focal elongth f produces an image magnified m times.The distance of the object from mirror is

A. $(m-1)f/m$

B. $(m+1)f/m$

C. $(m-1)f$

D. $(m+1)f$.

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331. A convex mirror forms an imge,which is $1/n$ times the size of the object .If the focal length of the mirror is f,the distance of the object is

A. nf

B. f/n

C. $(1-n)/f$

D. $(n+1)f$.

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332. A short linear object of length b lies along the axis of a concave mirror of focal length f at a distance u from the pole. What is the size of the image?

A. $b\left(\frac{u-f}{f}\right)^{1/2}$

B. $b\left(\frac{f}{u-e}\right)^{1/2}$

C. $b\left(\frac{u-f}{f}\right)$

D. $b\left(\frac{f}{u-f}\right)^{2}$.

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333. A diminihsed virtual image can be produced only with

A. a plane mirror

B. a concave mirror

C. a convex mirror

D. all of them.

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334. A virtual image larger than the object can be produced by

A. a cocave mirror

B. a convex mirror

C. a plane mirror

D. concave lens.

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335. The field of the view is maximum for

A. plane mirror.

B. concave mirror

C. convex mirror

D. parabolic mirror

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336. In case of spherical mirrors,which of the followed do/does not depend upon,whether the incident rays are paraxial or not?

A. pole

B. focus

C. principle axis

D. radius of curvature

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337. Light appears to travel in a straight lines,since

A. it is not absorbed by the atmosphere

B. it is reflected by the atmoshphwere

C. its waveelngth is very small

D. its velocity is very large

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338. If the light prpagating along a straight ine bends by a small but fixed angle,it may be due to

A. reflection

B. refraction

C. dispersion

D. diffraction

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339. A glass slab of thickness 4 cm contains the same number of waves as 5 cm of water,when both are traversed by the same monochromatic light.If the refractive index of water is $4/3$,what is the refractive index of glass?

A. $5/3$

B. $5/4$

C. $16/15$

D. 1.5

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340. The lateral shift produced in a parallel sided glass slab depends on

A. the angle of incidence

B. the thickness of the glas slab

C. the refractive index of the material of the slab

D. All of the above.

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341. Light passing from air to glass is refracted ,as is light passing from glass to air. However, when you look out of a window at the view outside, the light does not seem to have been distorted. This is because

A. the angle of refraction is too small to observe

B. light incident upon the glass is partially reflected and this tends to mask the effect of refraction

C. the emergent ray is parallel to the incident ray and only lateral displacement occurs

D. the window pane is too thin for refraction to occur.

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342. A person swimming at the bottom of a swimming pool lookds up to the diving board.The board

A. appears nearer

B. appears farther

C. appears at the correct position

D. is not seen at all.

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343. Total interval reflection takes place, when light travels from

A. water to glass

B. glass to diamond

C. water to air

D. air to mercury

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344. A ray of light from a sodium lamp undergoes total internal reflection.The critical angle will be smallest,when it travels from

A. water to glass

B. glass to air

C. glass to water

D. water to air.

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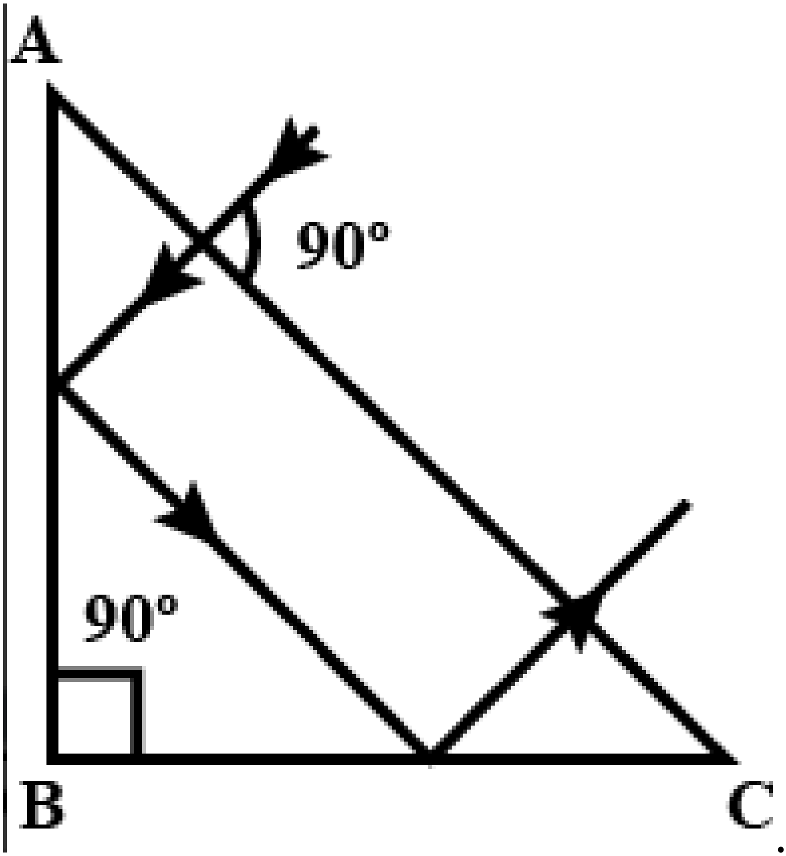
345. A ray of light falls on a right angled prism ABC (AB=BC) and travels as shown in the figure. The minimum refractive index of prism material should be



A. 1.33

B. $\sqrt{2}$

C. 1.5

D. $1.5 / 1.33$.

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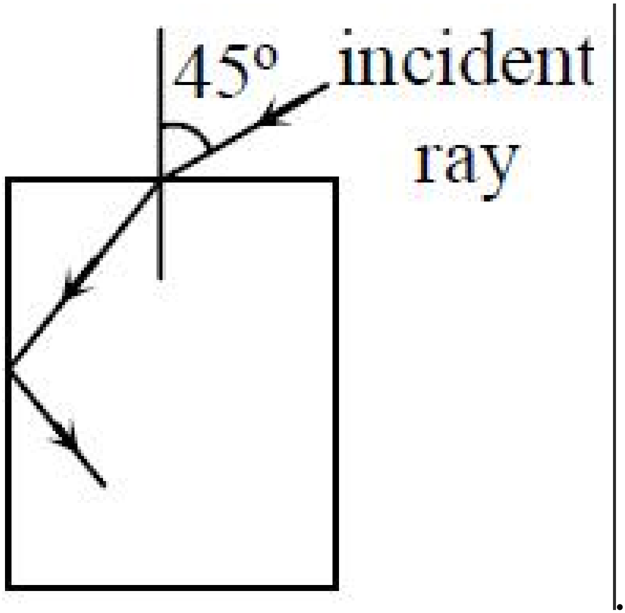
346. For the given incident ray as shown in the figrue,the condition of total interna reflection of the ray will be satisfied,if the refracrtive index of block will be



A. $\left(\sqrt{3}+1\right)/2$

B. $\left(\sqrt{2}+1\right)/2$

C. $\sqrt{3/2}$

D. $\sqrt{7/6}$.

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347. The critical angle of light passing from glass to air is minimum for

A. red

B. geen

C. yellow

D. violet.

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348. Which of the following phenomenon is used in optical fiber?

A. Scattering

B. Successive reflections

C. Refraction

D. total internal reflection

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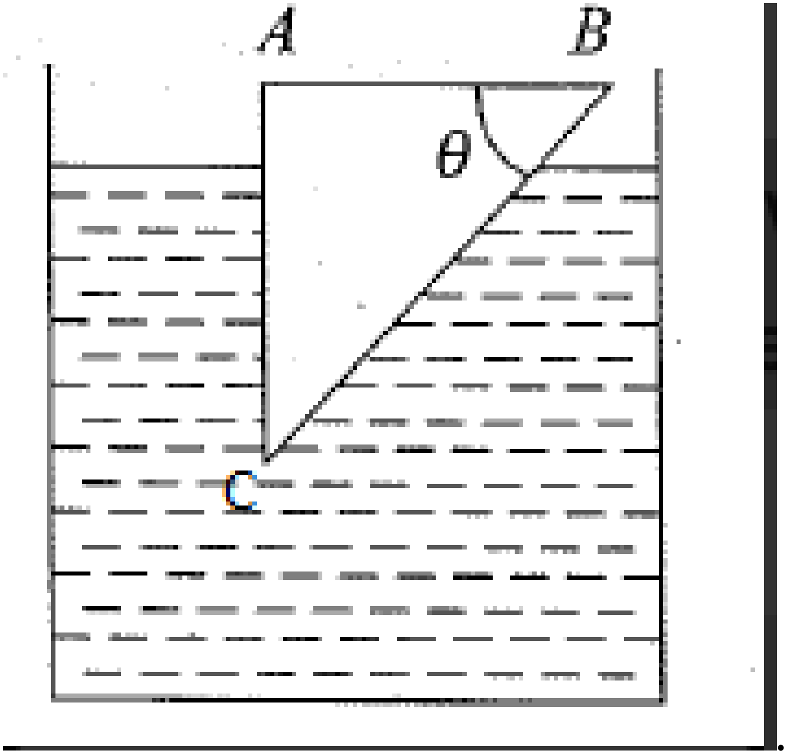
349. A glass prism of refractive index 1.5 is immersed in water $(\mu = 4/3)$. A light beam normally on the face AB is totally reflected to reach on the face BC if



A. $\sin\theta \geq 8/9$

B. $2/3 < \sin\theta < 8/9$

C. $\sin\theta \leq 2/3$

D. none of the above

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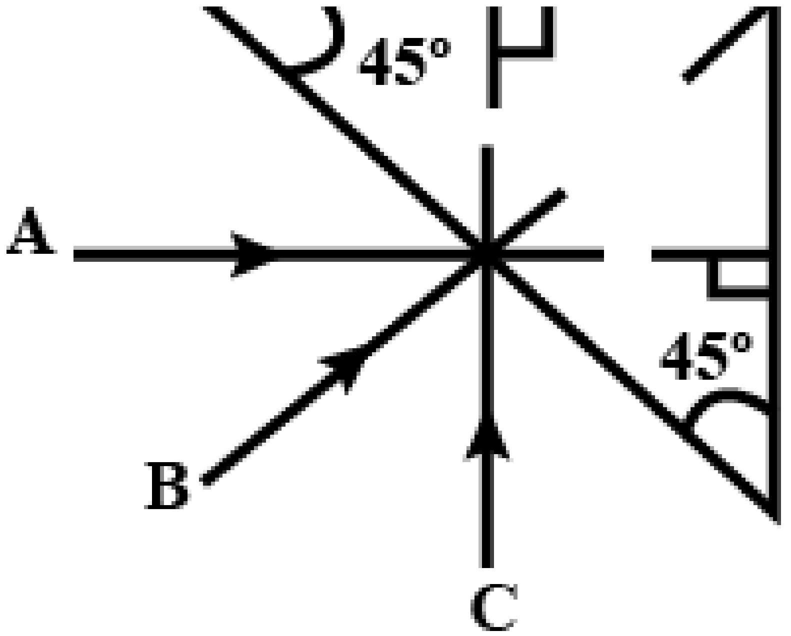
350. A,B and C in the diagram represent rays of light incident upon a face of a right-angled prism.Before emerging from the prism,which ray(or rays)will experience total interal reflection?Given critical angle is 42 .



A. A

B. B

C. C

D. none of the above

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351. Refractive index of water is $5/3$. A light source is placed in water at a depth of 4m. Then what must be the minimum radius of disc placed on water surface so that the light of source can be stopped?

A. 3m

B. 4 m

C. 5 mm

D. 00.

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352. A fish looking up through the water sees the outside world contained in a circular horizon.If the refractive index of water is $4/3$ and fish is 12 cm below the surface of water,then the radius of the circular horizon is

A. $16cm^2$

B. $9cm^2$

C. $12cm^2$

D. $13.6cm^2$.

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353. A diver in swimming pool wants to signal his distress to a person lying on the edge of the pool by flashing his water proof flash light.

A. He must direct the beam vertically upward

B. He has to direct the beam horizontally

C. He has to direct the beam at an angle to the ertical which si slightly less than the critical angle of incidence for total reflection.

D. he has to direct the beam at an angle to the vertical which is slightly more than the critcal angle of incidence for total reflection.

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354. An equiconvex lens has focal length equal to the radius of curvautre.Its refractive index is

A. 1.4

B. 0.16

C. 1.3

D. 1.5.

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355. What is the focal length of a double convex lens for which radius of curvature of the surfaces is 40 cm and refractive index of the glass is 1.5?

A. 50 cm

B. 40 cm

C. $-30cm$

D. $-40cm.$

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356. A lens behaves as a converging lens in air and diverging lens in water.The refractive index of the material of the lens is

A. equal to unity.

B. equal to 1.33.

C. between unity and 1.33

D. greater than 1.33.

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357. The two surfaces of a convex lens are of same radius of curvature.It is cut into two equaol parts by a plane perpendicular to its principal axis.If the power of the lens was originally D,then the power of the either porition will be

A. $D/4$

B. $D/2$

C. D

D. 2D

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358. The two surfaces of a convex lens are of same radius of curvature.It is cut into two equaol parts by a plane perpendicular to its principal axis.If the power of the lens was originally D,then the power of the either porition will be

A. $D/4$

B. $D/2$

C. D

D. 2D

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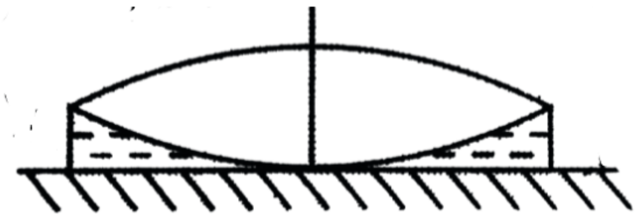
359. A convex lens is placed in contact with a mirror as shown in figure. If the space between them is filled with water, its power will



A. decrease

B. increase

C. remain unchanged

D. can increase of decrease depending on the focal length.

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360. For a given distance between an object and an image screen,magnification is 3 for a certain position of convex lens.On moving the lens through 0.2 m towards screen,magnification is $\frac{1}{3}$.Focal length of the lens is

A. 0.075 m

B. 0.01 m

C. 1 m

D. 0.15 m

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361. An object is placed at a distance of $f/2$ from a convex lens .The image will be

A. at $3f/2$,real and inverted

B. at 2f,virtual and erect.

C. at 2 f,real and inverted

D. at one of the foci,virtual nd double ists size.

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362. A camera is focussed to take a cose up picture of an insect at a distance of 5 cm from the camera lens.If the fiml is 10 cm away from the lens,what must be the focal length of the lens,expressed in cm?

A. 3.3 cm

B. 10 cm

C. 5 cm

D. 2 cm

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363. The graph drawn with object distance along abbscissa and image distance as ordinate for a convex lens is

A. a straight line

B. a circle

C. a parabola

D. a rectangular hyperbola.

364. Two plane -convex lenses,each having focal length of 0.4 m,are pressed against each other at their plane faces.This forms a double convex lens.At what distace from this lens must an object be placed to obtain a real,inverted image with magnificatin one?

A. 0.4 m

B. 0.4 mm

C. 0.2 m

D. 1.6 m

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365. A film projector magnifies a $100cm^2$ film strip on a screen.If the linear magnification is 4,the area of the magnified film on teh screen is

A. $1, 600cm^2$

B. $400cm^2$

C. $800cm^2$

D. $200cm^2$.

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366. In order to include the effect of thickness t of the lens,following four modifications are suggested in the lens equation.Which one accounts for the modification correctly in your opinion?

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

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

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

D. $-\frac{1}{u+t}+\frac{1}{v-t}=\frac{1}{f}$.

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367. A beam of light is incident on a convex lens parallel to its principal axis.As one moves away from the optical centre off the lens on its other side,the intensity of light

A. continously increases

B. continously decreases

C. first incrases and then decreases

D. first decreases and then incrases.

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368. The plane face of the plano-convex lens of focal length 20 cm is silvererd .What type of mirror will it behave like and what will be its focal length (f)?

A. f=20 cm (convex0

B. f=20 cm (concave)

C. f=10 cm (convex)

D. f=10 cm(concave)

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369. A lens having focal length f and aperture of diameter $d/2$ in the central region of the lens is covered by a black paper.Focal length of the lens and intensity of image image now will

be respectively

A. $f/2, I/2$

B. $f, I/4$

C. $3f/4, I/2$

D. $f, 3I/4.$

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370. A beam of parallel rays is brought to focus by a plano-convex lens.A thin concave lens of same focal length is joined to the first lens .The effect of this is that

A. the focal point shifts away from the lens by a small distance

B. the focus shifts to infinity

C. the focus remains undistruubed

D. the focus moves sidewards.

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371. Large aperture of lens results in

A. chrmatic aberration

B. spherical aberration

C. curvature

D. astigmatism

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372. The spherical abberation in a lens may be inimised by designing of the lens,so that the deviation of rays is

A. minimum

B. minimum at first surface

C. minimum at second surface

D. equal at both surfaces.

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373. A glass prism placed in a homogeneous transparent medium will deivatie an incident ray

A. always towards its base

B. always away from its base

C. towards its base,only if the medium has a refractie index greater thant hat of glass

D. towards the base,only if the medium has a refractive index less then that of glass.

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374. Angle of minimum deviation for a prism of refractive index 1.5 is equal to the angle of prrism.The angle of prism is

A. 62°

B. 41°

C. 82°

D. 31°.

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375. Yellow light is refracted through a prism producing minimum deviation .If i_1 and i_2 denote the angle of incidence and emergence respectively for the prism,then

A. $i_1 = i_2$

B. $i_1 > i_2$

C. $i_1 < i_2$

D. $i_1 + i_2 = 90^\circ$.

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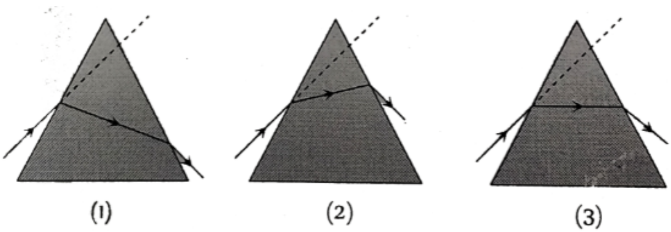
376. The figures represent three cases of ray passing through a prism of refractive edge A.The case corresponding to minimum deviation is



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A. 1

B. 2

C. 3

D. none of these.

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377. The refracting angle of a prism is A and the refractive index of its material is cot $A/2$

.For a ray of light incident on the prism,find the angle of minimum deviation in terms of A.

A. $180^{\circ} - 3A$

B. $180^{\circ} + 2A$

C. $90^{\circ} - A$

D. $180^{\circ} - 2A$.

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378. A prism splits a beam of white ligth into its seven constituent colours.This is so,because

A. velocity of different colours is different

B. amplitude of different colours id diffrent

C. energy of different colours is different.

D. enrergy of diffrent colours is same

Answer: velocity of differnt colours id different.

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379. A narrow beam fo white ligth passes throuugh a glass slab havig parallel faces.Then,

A. the beam inside the slab remains as white ligth

B. the emergent beams is white light

C. The light never splits in different colours.

D. the beam inside the slab undergoes dispersion

Answer: the glasss slab never causes dispersion.

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380. Refractive indices of a prism material for two wavelengths are 1.66 and 1.64.The dispersive power is

A. 0.02

B. 0.012

C. 0.01

D. 0.03

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381. When a glass prism is placed inside water,its dispersive power

A. decreases

B. increases

C. remains the same

D. may increase or decrease depending on the angle of prism

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382. During dispersion of white light by prism placed in air,

A. both angular deviation and angular spread take place

B. either angular spread or angular deviation for the mean colour takes place depending on the angle of the prism

C. only angular spread takes place

D. only angular deviation tkes place.

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383. The figure shows the view through the eye-piece of a prism spectrometer with its slit illuminated y the souce of light emitting three wavelengths corresponding to yellow(Y),green(G) and unknown colour(X).The colour at X may be:

A. red

B. orange

C. pink

D. none of the above

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384. One cannot see through fog, because:

A. fog absorbs the light.

B. the refractive index of fog is infinity

C. light suffers total internal reflection at the droplet in fog

D. light is scattered by the droplets in fog

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385. The sky would appear red instead of blue,if

A. atmospheric particles scatter blue light more than red light

B. atmospheric particles scatter all colours equally

C. atmospheric particles scaater red ligth more than blue light.

D. the sun was much hotter.

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386. What is the cause of formation of a rainbow?

A. reflection

B. diffraction

C. interfernce and diffraction

D. dispersion and reflection.

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387. Which fo the following statement is correct?

(i)Line spectra is chraracteristic of the atom.

(ii)Band spectra is characteristic of the molecule

A. only(i) is correct

B. only(ii) is correct

C. Both (i) and (ii) are correct

D. Both (i) and (ii) are incorrect.

388. Fraunhofer spectrum is a

A. line absorption spectrum

B. band absorption spectrum

C. line emmission spectrum

D. band emission spectrum

389. In which one of the following regions of teh electromagnetic spectrm will the vibrational motion of molecules give rise to absorption spectrum?

A. ultraviolet

B. microwaves

C. infrared

D. radiowaves.

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390. In case of lens,which of the following quantities depend on the wavelengths of the incident light?

A. Focal length

B. Radii of curvature

C. Power

D. Chromatic aberration.

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391. A converging achromat lens is to be made by placeing two lenese in contact.The proper choice is

A. convex lens of crown,concave lens of flint glass

B. convex lens of flint,concave lens of crown glass

C. both the lenses should be convex lenses of crown glass.

D. both the lenses should be convex lenses of fint glass

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392. A combination is made of two lenses of focal lengths f and f' and dispersive power ω and ω' respectively, The combination is achromatic when

A. $\omega' = \omega_0, \omega'$ =2 ω_0, f'=2f

B. $\omega'=\omega_0, \omega'=2\omega_0$,f'=-2f

C. $\omega'=\omega_0, \omega'=2\omega_0, f' = f/2$

D. $\omega'=\omega_0, \omega=2\omega_0, f' = -f/2.$

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393. When we see an object,the image formed on the retina is

A. real

B. inverted

C. virtual

D. erect

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394. The focal length of the normal eye-lens is approximaterly

A. 2 cm

B. 25 cm

C. 1 m

D. infinite

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395. The distances of the human eye-lens from the retina is x.For a normal eye,the maximum focal length of the eye-lens is

A. $x/2$

B. x

C. less than x

D. greater than x

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396. Why is a normal eye not able to see clearly the objects placed closer than 25 cm?

A. the focal length of the eye - lens is 25 cm

B. the distance between the eye-lens and retina is 25 cm

C. the eye-lens cannot decreases its focal length beyond a limit

D. the eye-lens cannot decrease its distance from the retina beyond a limit.

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397. When we view objects lying at differnt distances from the eye,which fo the followingt remain constatn?

A. The focal length of the eye-lens

B. The radii of curvature of teh eye-lens

C. The object distance from the eye-lens

D. The image distance from the eye-lens.

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398. Draw a ray diagram to show the image formation by a simple microscope. What is the nature of the image formed?

A. real and erect

B. real and inverted

C. virtual and erect

D. virtual and inverted.

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399. If the least distance of distinct vision is 25 cm,then a convex lens of focal length 5 cm acts as a magnifier of magnifying power

A. 5

B. less than 5

C. 6

D. more than6.

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400. The convex lenses of focal lengths 0.3 m and 0.05 m are used to make a telescope .In normal adjustment,the distance between them is equal to

A. 0.35 m

B. 0.25 m

C. 0.175 m

D. 0.15 m

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401. An observer looks at a tree of height 15 m with a telescope of magnifying power 10.To him,tree appears

A. 10 times taller

B. 15 times taller

C. 10 times neraere

D. 15 times nearer.

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402. Magnifying power of a telescope is m.If the focal length of the eye-piece is doubled,then its magnifying power will become

A. 2 m

B. $m/2$

C. $\sqrt{2}m$

D. 3 m

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403. A fly is sitting on the objective of a telescope pointed to the moon.What effect is expected in the photograph of the moon taken through the telescope?

A. The entire field of vision is blocked

B. there is an image of the fly on the photograph

C. there is no effect at all

D. The image of the moon is of lesser intensity.

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404. A telescpe is focussed on the moon.If a tiny drop of ink falls on its objetive,then

A. moon will appear black

B. there will be a dark spot in the field of view

C. brightness of the imge will be slightly reduced

D.

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405. For observing a cricket match,binocular is prefferred to tererestrial trelescope for the reason that

A. the binocular is very easy to handle

B. the binocular provides three dimenstional vision

C. the binocular produces image free of chromatic aberration.

D. the binocular produces erect image.

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406. A reflecting telescope utilizes

A. a concave mirror

B. a convex mirror

C. a prism

D. a plano convex lens.

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407. The resolving power of a telescope depends upon

A. the focal length of teh eye lens

B. the focal length off the obbject lens

C. the length of the telescope

D. the diameter of the object lens.

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408. Large aperture telescopes are used for

A. greater resolution

B. greater magnification

C. reducing lens aberration

D. case of manufacture.

409. Light has the following wave property:

A. Transverse

B. Longitudinal

C. Sometimes longitudinal,smetimes transverse.

D. Neighter transverse nor longitudinal.

410. Which of the following produces a plane wavefront?

A. Point source

B. Line source

C. extended source

D. None of the above.

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411. As a plane wavefront propagates, its radius of curvature

A. decreases

B. increases

C. first incrases and then decreases

D. remains infinity.

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412. A plane wavefront is propagating in a medium.Which of the following is true?

A. It propagates parallel to itself

B. it cannot propagate in the medium

C. It changes to spherical wavefront

D. It changes to cylindrical wavefront.

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413. Which of the following is a correct statement ?The ray of light

A. is always tangential to the wavefront

B. is always normal to the wavefront

C. does not exist in the Huygens' principle

D. may be tangential or normal to the wavefront.

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414. Though quantum theory of light can explain a number of phenomena observed with light ,it is necessary to retain the wave nature of light to explain the phenomenon of

A. photoelectric effect

B. diffraction

C. Compton effect.

D. black body radiation.

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415. Hiygens' concept of secondary waves

A. obtain the new position off wavefront geometrically

B. explain principle of superposition of waves

C. explain interference phenomenon

D. explain polarisation.

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416. Which one off the following phenomena is not explained by Huygens' construction f wavefront?

A. Diffraction

B. Origin of psectra

C. Refraction

D. Reflection

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417. Two points are situated at the same distance from a source of light but in opposite direction. The phase difference between the light waves from the two points will be

A. π

B. zero

C. $\pi / 2$

D. none of the above.

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418. One important similarity between sound and light waves in that both

A. can pass through even in the absence of any medium

B. ae rtrasnverrse waves

C. travel at the same speed in air

D. can show interference effects

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419. Monochromatic light means

A. a beam of the same colour

B. a cluster of beam of different coours

C. a beam of white colour

D. none of these.

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420. Two waves of the same frequency and same intensity are superimposed in the same phase.The intensity of thye resultnat wave at the central point will e

A. equal to that of the individual wave

B. twice that of the individual wave

C. three times that of the individual wave

D. four times that of the individual wave.

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421. In Youngs' experiment,the ratio of maximum and minimum intensitties in the fring system is $9:1$.The ratio of amplitudes of coherent sources is:

A. $9:1$

B. $3:1$

C. $2:1$

D. $1:1$

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422. The intensity of light issuing out of two slits in Youngs' experiment is in the ratio $1:4$ .The intenstiy o the minimum to the maximum will be in the ratio

A. $1:2$

B. $1:4$

C. $1:9$

D. none of the above.

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423. The light waves from two coherent sources of intensity I interfere.At the minima,intensity of light is zero.The intensity of light at the maxima is

A. 4 I

B. I

C. 2I

D. I^2.

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424. In duble slit experiment,the two slits are illuinatd with two independent identical sources of light.What happens to the interference patter?

A. No interfernce pattern is produced

B. The intensity of brihgt fringes gets doubled.

C. The intensity of bright fringes becomes four times

D. Two sets of interfernce pattern are produced.

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425. Four light waves are expressed as

(i)$y_1 = a_1 \sin \omega t$,

(ii)$y_2 = a_2 \sin 2\omega t$,

(iii)$y_3 = a_3 \cos(\omega t + \phi)$ and

(iv)$y_4 = a_4 \sin 2(\omega t + \phi)$.

The interference is possible between

A. (i) and (ii)

B. (i) and (iii)

C. (ii) and (iv)

D. (iii) and (iv)

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426. In a certain double slit experiment set up,inerfernce fringes of width 1.0 mm each are observed with ligth of wavelength $5,000\overset{\circ}{A}$ .Kepping the set up unalatered ,if teh source is replaced with one havin a wavelegnth $6,000\overset{\circ}{A}$,the fringe width will be

A. 0.8 mm

B. 1.0 mm

C. 1.2 mm

D. 1.44 mm

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427. What change is observed in interference pattern of Young's double slit experiment ,if one of the two slits is painted,so that it transmits half the light intensity of the other?

A. the bright frringes become fainter

B. the fringe width decreases

C. there is a bright slit and no interfrerence pattern is produced

D. there is uniform illumination all over the screen.

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428. In a Young's double slit experimen,two slits fo equal intensity of the central bright fringe is I.If one of the slits is closed,the intensity at the centre of the screen will be

A. I

B. $I/4$

C. $I/2$

D. 2 I

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429. In young's double slit experiment,if a thin glass place is placed in the path o fone of the interfering beams ,then

A. fringe width decreases

B. fringe width incrases

C. fringe pattern is shifted

D. fringe pattern is unaffected.

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430. What happens,if the monochromatic light used in Young's double slit experiment is replace by white light?

A. The bright fringes becmoe white

B. the central fringe is white and all other are coloured

C. All fringes are coloured

D. No fringes are observed.

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431. While both light and sound show wave chracter,diffraction is much harder to observe in light.This is beacuse:

A. light does not require a medium

B. wavelength of light is far smaller

C. waves of light are transverse

D. sped of light is far greater

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432. The amplitude moduclated waves (AM) used in ratio broadcasting bend apperciably round the corners of a $1m \times 1m$ wall but the frequnency modulated waves (FM) bend only negligibl.If the avereage wavelengths of AM and FM waes are λ_1 and λ_2,then

A. $\lambda_1 > \lambda_2$

B. $\lambda_1 = \lambda_2$

C. $\lambda_1 < \lambda_2$

D. cannot be predicted.

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433. Scattering of light is a direct consequence of

A. interfrenece

B. dispersion

C. diffraction

D. reflenction.

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434. The width of the difraction band varies

A. directly as the distance between sit and the screen

B. inversly as the wavelength

C. directly as the width of the slit

D. none of the above

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435. If the diffraction pattern due to single slit of width a with incident light of wavelength λ with angle off diffraction θ ,the condition for the first minimum is

A. $\lambda \sin \theta = a$

B. $a \cos \theta = \lambda$

C. $a \sin \theta = \lambda$

D. $\lambda \cos \theta = a.$

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436. What will be the effect on the interferece fringes,if red light is replaced by blue light?

A. There is no change in the diffraction pattern

B. Diffraction frines become narrow and crowded together

C. Diffraction fringes become broader and farther apart

D. Diffraction pattern disappears.

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437. The interfernce phenomenon differs from diffraction in that unlike diffraction,

A. interfrernece fringes are of varying intensity

B. interference cannot be observed with white igth.

C. interfrernece minima may be perfeclty dark

D. interference fringes are of unequal width.

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438. The resolution limit of the eye is 1 minute.At a distance x km from the eye,two persons stand with a lateral separation of 3 km.For the two persons to be just resolved by the naked eye,x should be

A. 10 cm

B. 15 cm

C. 20 km

D. 30 cm

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439. Two points separated by a distance of 0.1 mm can just be inspected in a microscope,when light of wavelength $6,000\overset{\circ}{A}$ is used.If the light of wavelength $4,800\overset{\circ}{A}$ is used,the limit of resulution will become

A. 0.8 mm

B. 0.12 mm

C. 0.1 mm

D. 0.08 mm

440. the limit of resolution of a 100 cm aperture telescope for light for wavelength $5.5 \times 10^{-7} m$ is

A. 0.149×10^{7}

B. 0.3

C. 1

D. 1.49×10^{7}

441. The liit of resuolution of one meter radio telescope for radio waves of wavelength 10 cm is about

A. $12.2 rad$

B. few seconds of arc.

C. 18°

D. one minute of arc.

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442. The aperture of the largest telescope in teh world is of the order of 5m.If the separation between the moon nd the earth is 4×10^5 km and teh wavelength of visible ligth is of the order of $5,000 A$,then the minimum separation between objects on the surface of the moon,which can be just resolved is

A. 1 m approximately

B. 10 m approximately

C. 50 m approximaterly

D. 200 m approximaterly.

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443. Which of the following phenomenon shows the transverse nature of light?

A. iffraction

B. polarisation

C. interference

D. dispersion

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444. The waves that cannot be polarised are:

A. longitudinal

B. transverse

C. electromagnetic

D. ligth.

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445. When a polariod is rotated,the intenstiy of ligth is not found to vary .The incident light may be

A. completely plane polarised

B. partially plane polarised

C. unpolarised

D. None of the above.

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446. What are plane of polarisation and plane of vibration?

A. are identical to each otehr

B. are orghogonal to each otehr

C. make an angle ,which depencds on teh colour of the light

D. rotate with respect of each other along the path of the beam

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447. In the propagation of ligth waves,the ngle between the direction of propagation and the plane of polarisation is

A. 0°

B. 45°

C. 90°

D. 180°.

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448. When the light is incident at the polarising angle ,which of the following is completely polarise?

A. Reflected ligth.

B. Refracted light.

C. Bothe reflected and refracted ligth

D. Neither refflected nor refracrted light.

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449. A ray of light is incident on a medium at polarising angle .What is the angle betweeen the relfected and refracted rays?

A. 0°

B. 90°

C. 180°

D. 60°.

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450. What is the polarising anle of a medium of refractive index $\sqrt{3}$?

A. 50°

B. 60°

C. 78°

D. 75°

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451. The expression relating polarising angle nad refrractive indes is

A. $\mu \sin p = 1$

B. $\mu \cot p = 1$

C. $\mu \tan p = 1$

D. $\mu \cos p = 1.$

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452. If the speed of light and the polarising angle for a given medium are c and p respectively ,then from Brewster's law ,we find

A. $c = v \cos ecp$

B. c= v tan p

C. c= v cos p

D. c= v cot p

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453. Suppose P is polarising angle for a transparent medium an the speed of light in the medium is v.Then,according to Brewster's law

A. $p = \cot^{-1} v/c$

B. $p = \cos^{-1} v/c$

C. $p = \sin^{-1} v/c$

D. $p = \cos ec^{-1} v/c.$

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454. A ray of light is incident on a medium at polarising angle .What is the angle betweeen the relfected and refracted rays?

A. $90^\circ + p$

B. $\sin^{-1}(\mu \cos p)$

C. $90^\circ - \sin^{-1}\left(\frac{\sin p}{\mu}\right)$

D. 90°.

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455. Which of the following materials may be used to produce polaroids?

A. Tourmaline

B. Calcite

C. Quartz

D. Crystals of quinine iodosulphate.

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456. The property of rotating the plane of polarisation is known as

A. optical activity

B. optical rotation

C. specific rotation

D. dichroism

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457. When a polaroid is rotated,the intesntiy of light varies and corresponding to a particular orientation,intensity reduces to zero.It shown that incident ligth is

A. copletely plane polarised

B. partially plane polarised

C. unpolarised

D. none of the above

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458. When a polaroid is rotated,the intensity of light varies but never reduces to zero.It shows that the incident light is

A. completely polarised

B. partially polane polarised

C. unpolarised

D. none of the above

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459. The specific rotation of an optically active substance of lenth l cm and concentratio c,with an optcial rotaion θ si

A. $\frac{lc}{10\theta}$

B. $\frac{\theta lc}{10}$

C. $\frac{10\theta}{lc}$

D. $\frac{10}{\theta lc}$.

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460. A decimetre length of solution with concentratin $500 kgm^{-3}$ rotates the plane of polarization by 24°.What is the specific rotation of th solution?

A. $48^{\circ} dm^{-1} g^{-1} cm^{3}$

B. $30^{\circ} cm^{-1} g^{-1} cm^{3}$

C. $12^{\circ} dm^{-1} g^{-1} cm^{3}$

D. $50^{\circ} cm^{-1} g^{-1} cm^{3}$.

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461. The specific rotation of a liquid of lenth 10 cm,concentration $2gcm^{-3}$ is $40^{\circ} cm^{-1} g^{-1} cm^{3}$.The angle s fo roation is

A. 10°

B. 70°

C. 80°

D. 90°.

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