PHYSICS

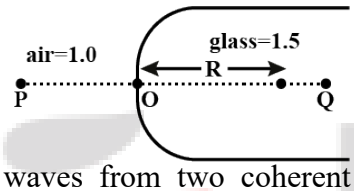
71. A diver looking up through the water sees the outside world contained in a circular horizon. The refractive index of water is $\frac{4}{3}$, and the diver's eyes are 15 cm below the surface of water. Then the radius of the circle is

(1) $15\times3\times\sqrt{5}$ cm (2) $15\times3\sqrt{7}$ cm

(3) $\frac{15\times\sqrt{7}}{3}$ cm (4) $\frac{15\times3}{\sqrt{7}}$ cm

72. A spherical surface of radius of curvature R separates air (refractive index 1.0) from glass (refractive index 1.5). The centre of curvature is in the glass. A point object P 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. The distance PO is equal to

(1) 5R
(2) 3R
(3) 2R
(4) 1.5R



73. The light waves from two coherent sources have same intensity $I_1 = I_2 = I_0$. In interference pattern the intensity of light at minima is zero. What will be the intensity of light at maxima?

(1) I_0 (2) $2I_0$

(3) $5I_0$ (4) $4I_0$

74. A galaxy is moving away from the earth at a speed of 286 km s^{-1}. The shift in the wavelength of a red line at 630 nm is $x \times 10^{-10}$ m.The value of x, to nearest integer, is[Take the value of speed of light c, as 3×10^8 ms^{-1}]

(1) 6 (2) 4

(3) 10 (4) 8

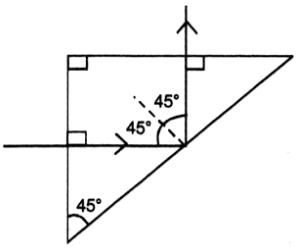
75. Which of the following processes play a part in the formation of a rainbow?

(i) Refraction
(ii) Total internal reflection
(iii) Dispersion
(iv) Interference

(1) (i), (ii) and (iii) (2) (i) and (ii)

(3) (i), (ii) and (iv) (4) (iii) and (iv)

76. A light ray is incident perpendicularly to one face of a 90° prism and is totally internally reflected at the glass-air interface. If the angle of reflection is 45°, we conclude that the refractive index n



(1) $n > \frac{1}{\sqrt{2}}$ (2) $n > \sqrt{2}$

(3) $n < \frac{1}{\sqrt{2}}$ (4) $n < \sqrt{2}$

77. Match the elements of table I and table II.

Table I		Table II	
1.	Myopia	(i)	Bifocal lens
2.	Hypermetropia	(ii)	Cylindrical lens
3.	Presbyopia	(iii)	Concave lens
4.	Astigmatism	(iv)	Convex lens

(1) 1-iii, 2-iv, 3-i, 4-ii
(2) 1-iv, 2-iii, 3-i, 4-ii
(3) 1-i, 2-ii, 3-iii, 4-iv
(4) 1-ii, 2-iv, 3-i, 4-ii

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

(1) $\sqrt{A_1A_2}$ (2) $\frac{A_1+A_2}{2}$

(3) $\frac{A_1-A_2}{2}$ (4) $\frac{1}{A_1}+\frac{1}{A_2}$

79. An astronomical refracting telescope will have large angular magnification and high angular resolution, when it has an objective lens of

(1) small focal length and large diameter
(2) large focal length and small diameter
(3) small focal length and small diameter
(4) large focal length and large diameter

80. In an astronomical telescope in normal adjustment a straight black line of length L is drawn on inside part of objective lens. The eyepiece forms a real image of this line. The length of this image is *l*. The magnification of the telescope is

(1) $\frac{L}{l}-1$ (2) $\frac{L+l}{L-l}$

(3) $\frac{L}{l}$ (4) $\frac{L}{l}+1$