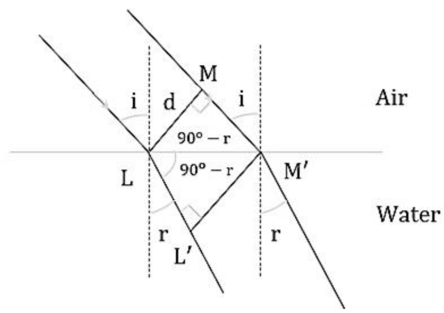
Q.1 Huygens's principle is used to,
(A)Obtain the new position of wavefront geometrically
(B)Explain the principle of superposition of waves
(C)Explain interference
(D)Explain polarization

Q.2 When light is refracted, which of the following does not change?
(A)Wavelength (B)Frequency (C)Velocity (D)Amplitude

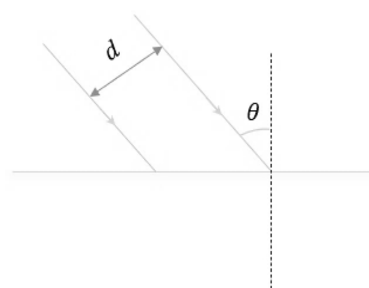
Q.3 A plane wavefront is incident on a convex mirror. After reflection, we will obtain
(A)a Plane wavefront (B)a Elliptical wavefront
(C)a Cylindrical wavefront (D)a Spherical wavefront

Q.4 The plane wavefront shown in the diagram is travelling from air to water. LM is the incident wavefront and L′M′ is the refracted wavefront. The wavefront LM is obliquely incident on the surface of water at an angle of incidence $60°$. If the distance $MM' = 10$ cm, find distance LL′. Take refractive index of water equal to 4/3.



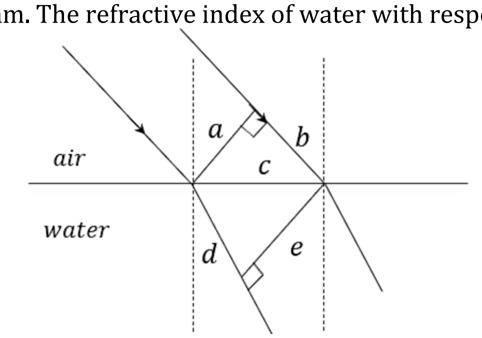
(A)30 cm (B)40 cm (C)13.33 cm (D)7.5 cm

Q.5 A parallel beam of diameter d is incident on the air-glass interface, as shown in figure. The diameter of the refracted light beam is
$\left(d = 3 \text{ mm},\ \theta = 45° \text{ and } \frac{n_{glass}}{n_{air}} = \frac{3}{2}\right)$



(A)$\sqrt{12}$ mm (B)$\sqrt{14}$ mm (C)$\sqrt{6}$ mm (D)$\sqrt{4.5}$ mm

Q.6 Figure shows plane waves refracted from air to water using Huygens' principle. a, b, c, d and e are the lengths on the diagram. The refractive index of water with respect to air is



(A) $\frac{a}{e}$ (B) $\frac{b}{e}$ (C) $\frac{b}{d}$ (D) $\frac{d}{b}$

Q.7 In Young's double slit experiment, the two slits are illuminated by a monochromatic source of light and interference fringes are observed on a screen placed in front of the slits. If a thin glass plate is placed in front of one of the slits, which of the following will change?

(A) fringe width **(B)** angular width of central bright fringe
(C) position of central bright fringe **(D)** All of the above

Q.8 Two parallel rays are travelling in a medium of refractive index $\mu_1 = 4/3$. One of the rays passes through a parallel glass slab of thickness t and refractive index $\mu_2 = 3/2$. The path difference between the two rays due to the glass slab will be

(A) $\frac{4t}{3}$ (B) $\frac{3t}{2}$ (C) $\frac{t}{8}$ (D) $\frac{t}{6}$

Q.9 A plate thickness t made of a material of refractive index μ is placed in front of one of the slits in a double-slits experiment. What should be the minimum thickness t which will make the intensity at the centre of the fringe pattern zero?

(A) $(\mu - 1)\frac{\lambda}{2}$ (B) $(\mu - 1)\lambda$ (C) $\frac{\lambda}{2(\mu-1)}$ (D) $\frac{\lambda}{(\mu-1)}$

Q.10 In Young's double slit experiment, a glass plate of refractive index 1.5 and thickness 5×10^{-4} cmis kept in the path of one of the rays, then

(A) There will be no shift in the interference pattern.
(B) Fringe width will increase.
(C) Fringe width will decrease.
(D) Optical path of the ray will increase by 2.5×10^{-4} cm

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(A)	(B)	(C)	(D)	(B)	(C)	(C)	(C)	(C)	(D)