MOST FREQUENT QUESTIONS FROM OPTICS & FIBER OPTICS WITH SOLVED ANSWERS

(1) Define total internal reflection.

When a light beam strikes the water, some of the light is reflected, and some are refracted. This phenomenon is called total internal reflection.

(2). which among the following is the property of light?

a. Diffraction
b. Reflection
c. Total internal reflection
d. All the options

Answer: d) All the options.

Explanation: Light can undergo refraction, diffraction, reflection and total internal reflection.

(3)How can you observe Dispersion?

(1) Wood

(2) Wall

(3) Paper

(4) Prism

Answer: (4) Prism

Explanation: A prism is an optical device through which we can observe the dispersion of white light into its constituent colors.

(5). what are the types of images formed?

(1) Real
(2) Virtual
(3) Neither real nor virtual
(4) Both real and virtual

Answer: (4) Both real and virtual.

(10) Which of the following is conserved when light waves interfere
(a) Intensity
(b) Energy
(c) Amplitude
(d) Momentum

Answer (b) Energy

Explanation: Refraction is the phenomenon that takes place due to the bending of light when it travels from one medium to another.

(11) Refraction is used in which devices Cameras?

a. Projectors
b. Telescopes
c. All the above options

Answer: d) All the above options.

(11). Two vertical plane mirrors are inclined at an angle of 60o with each other. A ray of light travelling horizontally is reflected first from one mirror and then from the other. The resultant deviation is
(a) 60
(b) 120
(c) 180
(d) 240

Answer. (d) 240

(12). A plane mirror reflects a pencil of light to form a real image. Then the pencil of light incident on the mirror is
(a) Parallel
(b) Convergent
(c) Divergent
(d) None of these

Answer. (b) Convergent

(13) For the sustained interference of light, the necessary condition is that the two sources should

(a) Have constant phase difference
(b) Be narrow
(c) Be close to each other
(d) Of same amplitude

Ans. (a) Have constant phase difference

2. Multiple reflections do not take place in a reflecting prism due to this; only one image is formed, which is very bright.

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

Ans. Actual depth of the pin, *d*= 15 cm

Apparent dept of the pin = d'

Refractive index of glass, $\mu = 1.5$

Ratio of actual depth to the apparent depth is equal to the refractive index of glass, i.e.

$$\mu = \frac{d}{d'}$$

$$\therefore d' = \frac{d}{\mu}$$

$$= \frac{15}{1.5} = 10\,cm$$

The distance at which the pin appears to be raised = $d - d'$

=15-10=5 cm

For a small angle of incidence, this distance does not depend upon the location of the slab.