Ray Optics and Optical Instruments

Q.No.1:
(i) Out of blue and red light which is deviated more by a prism? Give reason.
(ii) Give the formula that can be used to determine refractive index of materials of a prism in minimum deviation condition.

CBSE Board Paper 2010

Q.No.2:
Find the radius of curvature of the convex surface of a plano-convex lens, whose focal length is 0.3 m and the refractive index of the material of the lens is 1.5.

CBSE Board Paper 2010

Q.No.3:
Calculate the speed of light in a medium whose critical angle is 30°.

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Q.No.4:
A glass lens of refractive index 1.45 disappears when immersed in a liquid. What is the value of refractive index of the liquid?

CBSE Board Paper 2010

Q.No.5:
(a) Write the necessary conditions for the phenomenon of total internal reflection to occur.
(b) Write the relation between the refractive index and critical angle for a given pair of optical media.

CBSE Board Paper 2013

Q.No.6:
A convex lens of focal length 30 cm is placed coaxially in contact with a concave lens of focal length 40 cm. Determine the power of the combination. Will the system be converging or diverging in nature?

CBSE Board Paper 2013

Q.No.7:
A ray of light, incident on an equilateral prism $\left(\mu_g = \sqrt{3}\right)$ moves parallel to the base line of the prism inside it. Find the angle of incidence for this ray.

CBSE Board Paper 2012

Q.No.8: A convex lens is placed in contact with a plane mirror. A point object at a distance of 20 cm on the axis of this combination has its image coinciding with itself. What is the focal length of the lens? **CBSE Board Paper 2014**

Q.No.9: A concave lens of refractive index 1.5 is immersed in a medium of refractive index 1.65. What is the nature of the lens? **CBSE Board Paper 2015**

Q.No.10: (i) A giant refracting telescope has an objective lens of focal length 15 m. If an eye piece of focal length 1.0 cm is used, what is the angular magnification of the telescope ?
(ii) 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 3.48×10^6 m and the radius of lunar orbit is 3.8×10^8 m.

CBSE Board Paper 2015

Q.No.11:
A giant refracting telescope at an observatory has an objective lens of focal length 15 m. If an eyepiece lens of focal length 1.0 cm is used, find the angular magnification of the telescope. 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 3.42×10^6 m and the radius of the lunar orbit is 3.8×10^8 m.

CBSE Board Paper 2011