

DATED : AUG 22,2023.

Q1. With respect to air the refractive index of ice is 1.31 and that of rock salt is 1.54. The refractive index of rock salt with respect to ice will be

- (a) 1.51
- (b) 1.61
- (c) 1.71
- (d) 1.17

Q2. A person wears eye glass of focal length 70 cm, then far point of the person eye will be

- (a) 70
- (b) 60
- (c) 50
- (d) 40

Q3. Light is incident at an angle of (i) 30° (ii) 45° , on the same face of a given rectangular slab. If the angles of refraction, at this face are r_1 and r_2 in the two cases. Obtain the relation between these two angles.

Q4 A certain person has minimum distance of distinct vision is 150cm. He wishes to read a book at a distance of 25cm. Calculate the focal length glass should he use? What is the name and cause of eye defect? Draw a ray diagram show corrected eye.

Q5. A reporter records the following observations of an astronaut from his space ship.

(a) The length of the day is same as observed on the earth.

(b) Sky appears black in colour.

(c) The star appears to twinkle while the planets do not do so as they do on the earth. Justify your answer of each statement.

Q6. An object when placed 40cm in front of diverging lens it produces an image $\frac{1}{3}$ the size of object, where should an object be placed to get magnification $\frac{1}{2}$?

Q7. A convex lens forms a real and inverted image of a needle at distance of 60 cm. from it. Where is the needle placed in front of the convex lens if the size of image is $\frac{3}{2}$ to the size of objects? Also, find the power of lens.

Q8. An object is kept at a distance of (a) $\frac{a}{2}$ (b) $\left(\frac{3}{2}\right)^a$ from a convex lens having focal length of magnitude "a". Draw ray diagrams showing the formation of images formed in the two cases.

Case Study/ Source Based Qs.

Q9. We mostly read in newspaper, that few students went for picnic, but while boating one or two drowned in river. Situation below can be the reason for this. Situation- while boating with parents, a child saw a beautiful fish in the river or lake. He/she tried to catch it, thinking that it is very closer to him/her. But situation became worse when he/she drowned in the river/lake instead of catching it.

- (a) Name the phenomenon that shows the apparent position of fish, explain it.
- (b) If the fish appear at 50cm depth to him/her, then calculate the actual depth of fish. Taking refractive index of water as 1.50.
- (c) What will be the speed of light in water? If speed of light in air is 3×10^8 m/s.
- (d) Draw a ray diagram to show the above situation.