

DPP – 1

Light

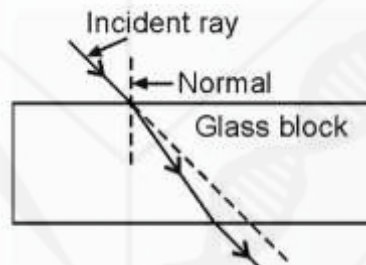
1. What do you understand by refraction of light?
2. What is the cause of refraction of light?
3. Does reflection take place along with refraction?
4. State two laws of refraction.
5. Define absolute refractive index of a medium.
6. For which colour of white light is the refractive index of a transparent medium the least?
7. For which colour of white light is the refractive index of a transparent medium maximum?
8. Name two factors on which refractive index of a medium depends.

9. Copy the diagram, and trace the course of rays through the glass block. In the diagram, mark angle of incidence (i) and angle of refraction (r) at the first interface.



How the refractive index of glass is related to angle (i) and angle (r)?

10. Diagram below, shows the path of ray of light through a glass slab. Copy the diagram and mark the lateral displacement of incident ray. State two factors which determine lateral displacement.



11. Calculate the speed of light in water, when refractive index of water is $\frac{4}{3}$ and speed of light in vacuum is $3 \times 10^8 \text{ ms}^{-1}$.
12. Explain with the aid of labelled diagram, the appearance of stick partially immersed in water.
13. Draw a properly labelled diagram to show that apparent depth of water in a tank is less than the real depth. How is the refractive index of water calculated from real and apparent depth?
14. Why do the faces of persons sitting around camp fire appear to shimmer? Explain.
15. Why does a fisherman aim at the tail of fish during spear fishing? Explain.

DPP – 2**Light**

1. The speed of light in air is $3 \times 10^8 \text{ ms}^{-1}$. Calculate the speed of light in glass. The refractive index of glass is 1.5.
2. The speed of light in diamond is $125,000 \text{ kms}^{-1}$. What is its refractive index?
(speed of light in air = $3 \times 10^8 \text{ ms}^{-1}$)
3. The refractive index of diamond with respect to air = 2.4. Express the refractive index of air with respect to diamond.
4. Define

(i) Prism.	(iv) Angle of deviation,
(ii) Refracting edge,	(v) Angle of emergence for a prism.
(iii) Refracting angle,	
5. (a) Draw a diagram to show the refraction of light of a single colour through a prism. On the diagram show clearly :

(i) incident ray,	(v) angle of emergence,
(ii) refracted ray,	(vi) angle of deviation
(iii) emergent ray,	(vii) angle of prism.
(iv) angle of incidence	

 (b) State the relation between $\angle i$, $\angle e$, $\angle A$ and $\angle \delta$.
6. What do you understand by the term deviation produced by a prism? State the factors on which angle of deviation depends.
7. Complete the following sentence by filling blank spaces
Angle of deviation is the angle which the..... (i)..... ray makes with the.
(ii)..... ray.
8. What do you understand by the term angle of minimum deviation for a prism?
9. Draw a graph between the angle of incidence and angle of deviation for an equilateral prism. On the graph clearly show the angle of minimum deviation.
10. An equilateral prism is placed in minimum deviation position. If the angle of incidence is increased, what happens to angle of deviation?
11. An equilateral prism is placed in minimum deviation position. How the following are related:

(i) angle of incidence $\angle i$ and angle of emergence $\angle e$
(ii) angle of refraction at two refracting faces i.e., $\angle r_1$ and $\angle r_2$.

DPP – 3

Light

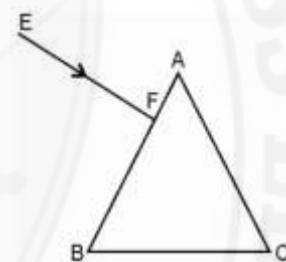
1. A ray of light passes through an equilateral prism, such that refracted ray is parallel to the base of prism. How are the angle of emergence $\angle e$ and angle of incidence $\angle i$ related to each other?
2. A yellow ray of light is incident on one of the refracting faces of an equilateral prism, such that angle of deviation produced is minimum (36°) and the angle of incidence is 48° .
 - (i) What is the angle of emergence?
 - (ii) If the angle of incidence is changed to : (a) 60° (b) 30° , state whether angle of deviation will be equal to, less or more than 36° .

3. A ray of light is incident at an angle of 72° on the refracting face of an equilateral prism. If the angle of deviation is 45° , calculate the angle of emergence.

4. The diagram below shows two identical prisms A and B placed with their faces parallel to each other. A yellow ray of light PQ is incident at the face of the prism A. Complete the diagram to show the path of ray as it emerges out of prism B.



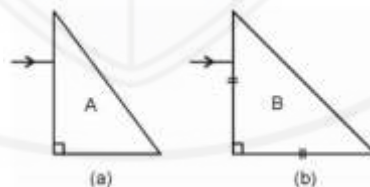
5. The diagram below shows an equilateral prism such that ray EF is incident normally on the face AB. Answer the following questions:



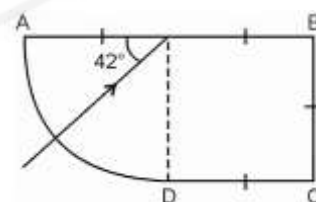
- (i) What is the angle of incidence on face AB?
- (ii) What is the angle of refraction on face AB?
- (iii) What is the angle of incidence on face AC?
- (iv) Will the ray suffer minimum deviation by the prism?

6. (a) Explain the terms: (i) total internal reflection, (ii) critical angle.
 (b) Write down a relation between refractive index and critical angle.
 (c) Under what conditions total internal reflection takes place?

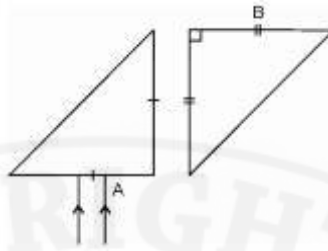
7. The diagrams given below show two glass prisms A and B. Two rays are shown in diagram. Copy the diagrams and trace the path of rays, till they emerge out of the prism.



8. A ray of light enters a glass slab ABCD as shown in the diagram. Copy the diagram and complete the path of ray, till it emerges out of glass slab. Mark the various angles wherever necessary. Critical angle for glass is 42° .

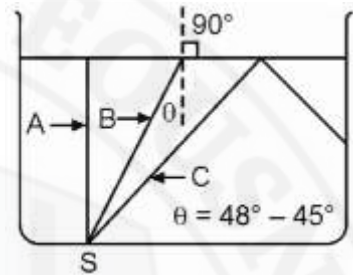


9. Copy the diagram below and complete it to show the rays emerging out of prism B. State the principle used for completing your ray diagram.



10. Figure given below shows a source of light S, placed at the bottom of a trough, containing water.

- (i) Copy the diagram and show the path of rays A, B and C.
- (ii) Does ray A undergo refraction?
- (iii) Name the phenomenon exhibited by ray C.
- (iv) State the conditions necessary for the phenomenon.



11. Why is an empty test tube placed obliquely in water, appears filled with mercury, when seen from above.
12. Why are the air bubbles rising up the fish tank appear silvery?
13. Why does a crack in a window pane appear silvery?
14. Why do diamonds sparkle for some time, even in darkness?
15. State four differences between reflection and total internal reflection.
16. A coin is placed at a depth of 15 cm in a beaker containing water. If the refractive index of water is $\frac{4}{3}$: Calculate the height through which the image of the coin appear raised.
17. A postage stamp placed under a glass slab, appears raised by 8 mm. If the refractive index of glass is 1.5. Calculate the actual thickness of glass slab.