



PRACTICAL QUESTIONS

Multiple Choice Questions

1. To trace the path of the ray of light through a glass prism, four students A, B, C and D did the following :

P : Kept the eyes at certain moderate distance from the glass prism while placing both the image pins.

Q : Kept the eyes close to the glass prism while placing both the image pins.

R : Kept the eyes close to the glass prism while placing first image pin and far from the prism while placing the second image pin.

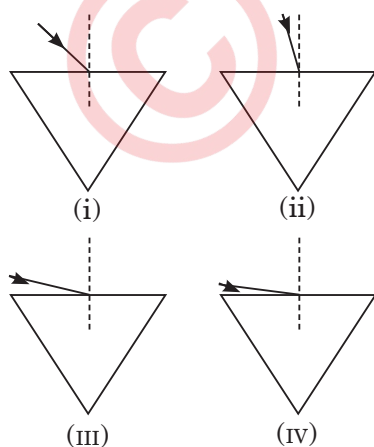
S : Kept the eyes at 45° angle while placing both the image pins on a line which makes an angle of 30° with the normal.

The correct procedure is that of the student

- (a) P
- (b) Q
- (c) R
- (d) S

Ans. (a) : to trace the path of the ray of light through a glass prism, one should kept his eyes at a certain moderate distance from the glass prism while placing the image pins.

2. Which of the following is the best set-up for tracing the path of a ray of light through a glass prism?



- (a) (i) only
- (b) (ii) only
- (c) (iii) only
- (d) (iv) only

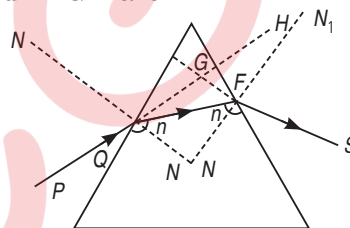
Ans. (a) : for tracing the path of a ray of light through a glass prism, the angle of incidence should be between 30° and 60° .

3. For tracing the path of a ray of light through a glass prism, the ideal distance between two pins is

- (a) 2 – 3 cm
- (b) 3 – 5 cm
- (c) 6 – 8 cm
- (d) 10 – 15 cm

Ans. (c) : The distance between the alpins should be atleast 6 cm.

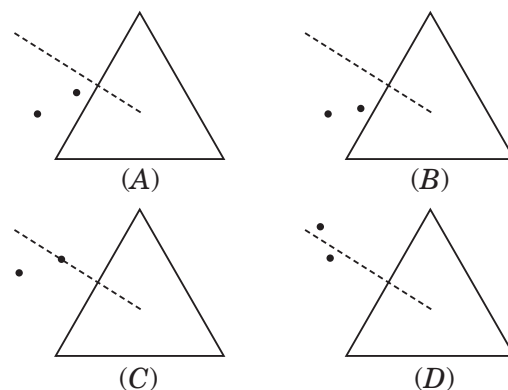
4. In an experiment to trace the path of a ray of light passing through an equilateral prism a student draw the diagram. In the diagram, $\angle SFN_1$ and $\angle FGH$ are :



- (a) Angle of emergence and angle of deviation
- (b) Angle of emergence and angle of refraction
- (c) Angle of deviation and angle of emergence
- (d) Angle of deviation and angle of refraction

Ans. (a) : $\angle SFN_1 = \angle e$, $\angle FGH = \angle \delta$.

5. Four students A, B, C and D perform experiment on tracing the path of light ray through a glass prism. The correct position of the pins used to describe incident ray is shown on paper by four of them, respectively as

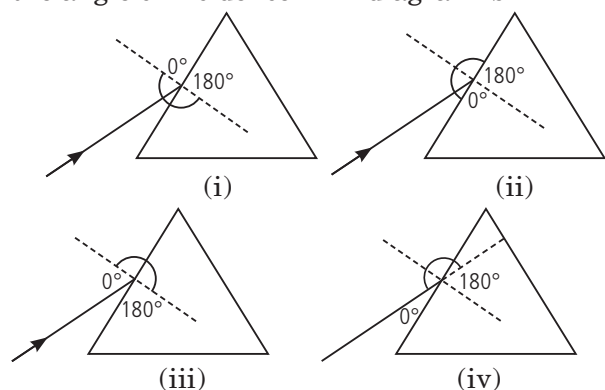


The correct result is obtained by,

- (a) A and B both
- (b) B and C both
- (c) A and D both
- (d) A only

Ans. (d)

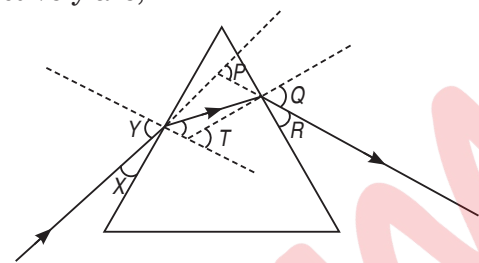
6. In an experiment of tracing the path of the rays of light passing through a glass prism, the correct setting of protractor (D) for measuring the angle of incidence $\angle i$ in diagram is



- (a) (i) (b) (ii)
(c) (iii) (d) (iv)

Ans. (a)

7. The correct angles of incidence, angle of deviation angle of and emergence in given figure respectively are,



- (a) X, P, R (b) X, T, R
(c) Y, T, Q (d) Y, P, Q

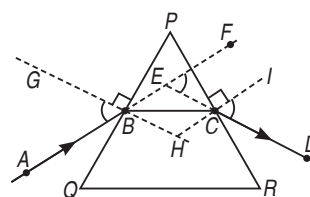
Ans. (d) : Correct angles of incidence, angle of deviation and angle of emergence is given by Y, P and Q respectively.

8. A student, while performing the experiment to trace the path of a ray of light through a glass prism fixes two pins vertically on an inclined straight line and looks at the images of these pins from the other side and fixes two other pins. The correct position will be such that this eye and

- (a) middle point of pins are in a straight line.
(b) head of pins are in a straight line.
(c) feet of pins are in a straight line.
(d) feet of all pins are in different lines.

Ans. (c) : Feet of pins are in straight line with eye.

9. The following figure depicts the bending of a ray of light on passing through a prism. Identify the angle of deviation from the given choices.



- (a) $\angle ABG$ (b) $\angle CEB$
(c) $\angle FEC$ (d) $\angle DCI$

Ans. (c) : The angle of deviation is given by $\angle FEC$.

10. While performing experiment to trace the ray of light through a triangular glass prism, a student is asked to draw the boundary of a prism on a paper. This is done to

- (a) see whether the given prism is triangular or not.
(b) ensure that the prism is always kept within the boundary during experiment.
(c) check whether the edges of the prism are broken or not.
(d) make the diagram more clear.

Ans. (b) : To ensure that the prism is always kept in a same place during the experiment, one should draw the boundary of a prism on a paper.

Subjective Questions

11. Define angle of deviation.

Ans. The angle between the incident ray and emergent ray is called angle of deviation $\angle D$. Incident ray is produced in forward direction while emergent ray is produced in the backward direction.

12. List the factors on which the angle of deviation through a prism depends.

Ans. The angle of deviation through a prism depends on

- (i) angle of prism,
(ii) nature of material of the prism and
(iii) angle of incidence.

13. Why does a ray of light bend towards the base when it passes through a glass prism?

Ans. A ray of light bends towards the base when it passes through a glass prism because when the ray of light goes from optically rarer medium (air) to optically denser medium (glass) at the incident surface while at the refractive surface, the light rays enter from denser medium to rarer medium.

14. Why does white light split into different colour when passes through a glass prism?

Ans. In dense medium the ray of light of different colour travel with different speed because the refractive index of medium is different for different colour of light hence white light split into different colour and bend through different angle with respect to the incident ray.

15. Why does the white light not split into different colours when it passes through a glass slab?

Ans. A glass slab whose faces are parallel can be considered as comprising two prisms of same refractive angle. The second identical prism can be considered in an inverted position with respect to the first prism. When a beam of white light passes through one prism, it gets dispersed, but on passing through the second inverted prism, the spectrum recombines to form a beam of white light again. Therefore, white light does not split into different colours when it passes through a glass slab.

