DAILY PRACTICE PROBLEM

Subject: Physics
Chapter: Ray Optics
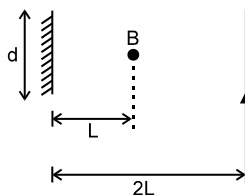**Topic**: Reflection through plane mirror
DPP No.: 01

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Q.1 Two plane mirrors are inclined at 60° to each other. The no. of images formed by them will be –

(1) 5   (2) 6   (3) 8   (4) None
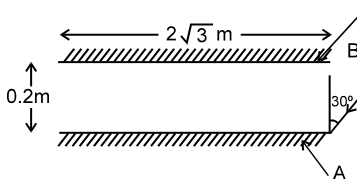
Q.2 To get three images of a single object, one should have two plane mirrors at an angle of

(1) 90°   (2) 120°   (3) 30°   (4) 60°

Q.3 A point source of light B is placed at a distance L in front of the centre of a mirror of width d hung vertically on a wall. A man walks in front of the mirror along a line parallel to the mirror at a distance 2L from it as shown. The greatest distance over which he can see the image of the light source in the mirror is

(1) d/2   (2) d   (3) 2d   (4) 3d

Q.4 Two plane mirrors A and B are aligned parallel to each other, as shown in the figure. A light ray is incident at an angle of 30º at a point just inside one end of A. The plane of incidence coincides with the plane of the figure. The maximum number of times the ray undergoes reflections (including the first one) before it emerges out is-

(1) 28   (2) 30   (3) 32   (4) 34

Q.5 It is desired to photograph the image of an object placed at a distance of 3 m from a plane mirror. The camera, which is at a distance of 4.5 m from the mirror, should be focused for a distance of -

(1) 3 m   (2) 4.5 m   (3) 6 m   (4) 7.5 m

Q.6 An object is placed between two plane mirrors inclined at an angle to each other. If the number of images formed is 7 then the angle of inclination is -

(1) 15°   (2) 30°   (3) 45°   (4) 60°

Q.7 In case of three plane - mirrors meeting at a point to form a corner of a cube, if incident light suffers one reflection on each mirror -

(1) the emergent ray is antiparallel to incident one

(2) The emergent ray is perpendicular to incident one

(3) The emergent ray is in phase with incident one

(4) the emergent ray is in opposite phase with incident one

Q.8 Two plane mirrors are parallel to each other and spaced 20 cm apart. An object is kept in between them 15 cm from A. Out of the following at which point is an image not formed in mirror A (distances measured from the mirror A)-

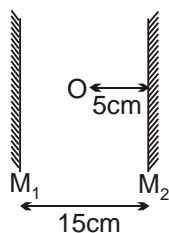(1) 15 cm   (2) 25 cm   (3) 45 cm   (4) 55 cm

Q.9 A plane mirror rotating at an angular velocity of 3 radian/s reflects a light beam. The angular velocity of the reflected beam is -

(1) 3 rad/s   (2) 6 rad/s   (3) 9 rad/s   (4) 12 rad/s

Q.10 Two parallel plane mirrors M_1 and M_2 have a length of 2 m each and are 10 mm apart. A ray of light is incident on one end of mirror M_2 at an angle of 30°. The number of reflections light undergoes before reaching the other end is –

(1) 346   (2) 134   (3) 80   (4) 173

Q.11 It is necessary to illuminate the bottom of a well by reflected solar beam when the light is incident at an angel of α = 40° to the vertical. At what angle β to the horizontal should a plane mirror be placed ?
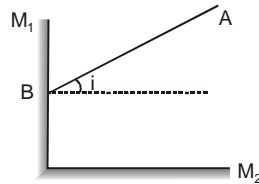
(1) 70°   (2) 20°   (3) 50°   (4) 40°

Q.12 A ray of light makes an angle of 20° with the horizontal and strikes a plane mirror which is inclined at an angle θ to the horizontal. The angle θ for which the reflected ray becomes vertical, is

(1) 40°   (2) 80°   (3) 55° & 35°   (4) 100°

Q.13 Two plane mirrors parallel to each other and an object O placed between them. Then the distance of the first three images from the mirror M_2 will be (in cm) –

(1) 5, 10, 15   (2) 5, 15, 30   (3) 5, 25, 35   (4) 5, 15, 25

Q.14 The mirrors are perpendicular to each other as shown in the Fig. A light ray AB is incident on the mirror M_1. Then the reflected ray will also suffer a reflection from the mirror M_2. Then the final ray after reflection from M_2 will be parallel to the incident ray, if -

(1) i = 45°   (2) i = 60°   (3) i < 30°   (4) for any i between 0° and 90°

Q.15 In the phenomenon of reflection

(1) velocity changes   (2) frequency changes

(3) wavelength changes   (4) phase may or may not change

Q.16 A man moves towards a plane mirror with a velocity v in a direction making an angle θ with the normal to the mirror. The magnitude of velocity of the image relative to man normal to mirror will be

(1) 2v   (2) 2v cosθ (3) 2v sinθ (4) 2v/cosθ

Q.17 When a plane mirror is placed horizontally on level ground at a distance of 60 metres from the foot of a tower, the top of the tower and its image in the mirror subtend an angle of 90° at the eye. The height of the tower is

(1) 30 metres   (2) 60 metres   (3) 90 metres   (4) 120 metres

Q.18 A point object is placed midway between two plane mirrors distance 'a' apart. The plane mirrors form an infinite number of images due to multiple reflections. The distance between nth order image formed in the two mirrors is-

(1) na   (2) 2 na   (3) $\frac{na}{2}$ (4) n^2 a

Q.19 Number of images of an object kept symmetrically between two mirrors inclined at angle 72°, would be-

(1) two   (2) three   (3) six   (4) four

Q.20 Two plane mirrors are inclined to one another at an angle of 40°. A point object is placed in between them. The number of images formed due to reflection at both mirrors is -

(1) Infinite   (2) 9   (3) 8   (4) 6

Answer key

Q.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans:	1	1	4	2	4	3	1,4	3	2	1	1	3	3	4	4
Q.	16	17	18	19	20
Ans:	2	2	2	4	3