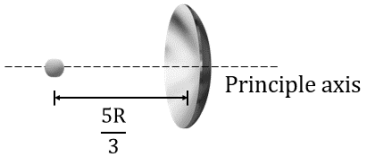
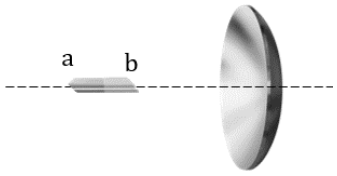
Q.1 A point object is placed at a distance $\frac{5R}{3}$ from the pole of a concave mirror. The radius of curvature of the mirror is R. The point object oscillates with an amplitude of 1 mm perpendicular to the principal axis. Then, the amplitude of oscillation of the image is.



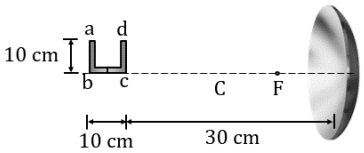
(A) $\frac{3}{7}$ mm **(B)** $\frac{2}{7}$ mm **(C)** $\frac{4}{3}$ mm **(D)** $\frac{11}{7}$ mm

Q.2 A small object ab of size 1 mm is kept at a distance of 40 cm from a concave mirror of focal length 30 cm. Then, the size of the image is.



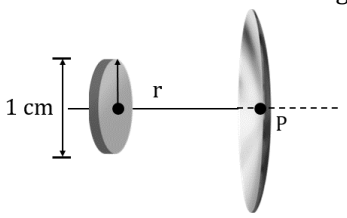
(A) 2 mm **(B)** 5mm **(C)** 6mm **(D)** 9mm

Q.3 A U− shaped wire abcd of length 30 cm is placed before a concave mirror having radius of curvature 20 cm. Find the total length of the image of wire.



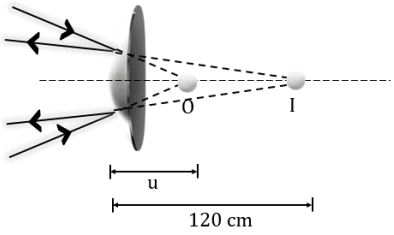
(A) 11 cm **(B)** 10cm **(C)** 12cm **(D)** 14cm

Q.4 A circular disc of diameter 1 cm has been placed on the principal axis of a concave mirror (R = 20 cm) with its plane perpendicular to the principal axis at a distance of 15 cm from the pole of the mirror. If the radius of disc starts increasing according to equation r = (0.5 + 0.1t) cm, where t is time in s, then what will be the rate at which radius of its image increasing?



(A) 0.2 cm/s **(B)** 0.3cm/s **(C)** 0.4cm/s **(D)** 0.5cm/s

Q.5 A convex mirror is placed in the path of the converging rays at a distance of 30 cm in front of the point of convergence. If the reflected rays appear to diverge from a point 1.2 m from the mirror, find its focal length.

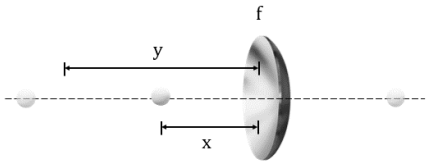


(A)16 cm **(B)**–20cm **(C)**24cm **(D)**–30cm

Q.6 An infinitely long rod lies along the axis of a concave mirror of focal length f. The near end of the rod is at a distance $u > f$ from the mirror. Its image will have a length

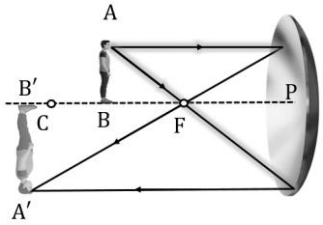
(A)$\frac{uf}{u-f}$ **(B)**$\frac{uf}{u+f}$ **(C)**$\frac{f^2}{u+f}$ **(D)**$\frac{f^2}{u-f}$

Q.7 An object is placed in front of a concave mirror of focal length f. A virtual image is formed with a magnification of 2. To obtain a real image of same magnification, the object has to moved by a distance



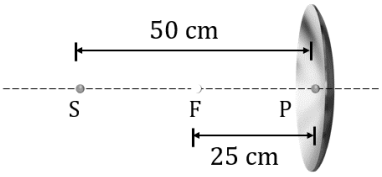
(A)f **(B)**$\frac{f}{2}$ **(C)**$\frac{f}{2}$ **(D)**$\frac{2f}{3}$

Q.8 It is observed that when an object placed in front of a spherical mirror, a real and enlarged image is formed. What is the type of mirror used and position of object are respectively?



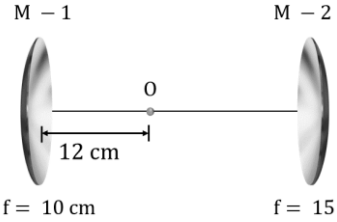
(A) Concave, between 'P' and 'F' **(B)**Concave, beyond 'C'
(C) Concave, between 'C' and 'F' **(D)**Convex, between 'C' and 'F'

Q.9 A concave mirror forms a real image of a point source lying on the optical axis at a distance of 50 cm from the mirror. The focal length of the mirror is 25 cm. The mirror is cut into two equal parts and each of the two halves are rotated about S by 90°, one in anticlockwise and other in clockwise with reference to the original position, then the distance between the two images formed by each part will be.



(A)3 cm **(B)**2cm **(C)**1cm **(D)**0cm

Q.10 Two concave mirrors are placed 40 cm apart and are facing each other. A point object lies between them at a distance 12 cm from the mirror M − 1. Find the location of the final image formed after two reflections, first at M − 1 and second at M − 2.



(A)$\frac{60}{7}$ cm left of M − 2 **(B)**$\frac{60}{7}$ cm right of M − 2

(C) $\frac{60}{7}$ cm right of $M-1$ **(D)** $\frac{60}{7}$ cm left of $M-1$

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(A)	(D)	(B)	(A)	(C)	(D)	(A)	(C)	(D)	(A)