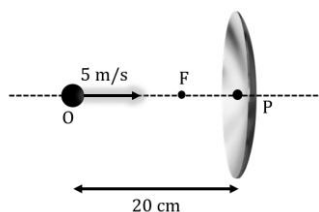


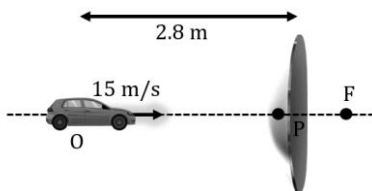
- Q.1** Assertion: In case of a concave mirror, if a point object is moving towards the mirror till focus along its principal axis, then its image will move away from the mirror.  
Reason: In case of reflection (along the principal axis of mirror), object and image always travel in opposite directions. Consider the spherical mirror to be stationary and choose the correct option.  
(A) Assertion and Reason are true and the reason is the correct explanation of the assertion.  
(B) Assertion and Reason are true and the reason is not the correct explanation of the assertion.  
(C) Assertion is true, but reason is false.  
(D) Assertion is false, but reason is true.

- Q.2** An object is 20 cm away from a stationary concave mirror having focal length 15 cm. If the object moves with a speed of 5 m/s along the principal axis towards the mirror, then the speed of the image will be.



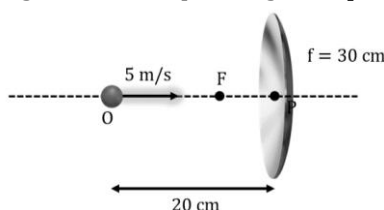
- (A) 45 m/s                      (B) 40 m/s                      (C) 35 m/s                      (D) 30 m/s

- Q.3** A car is fitted with a convex side view mirror of focal length 20 cm. A second car 2.8 m behind the first car is overtaking the first car at a relative speed of 15 m/s. The speed of the image of the second car as seen in the mirror of the first car will be



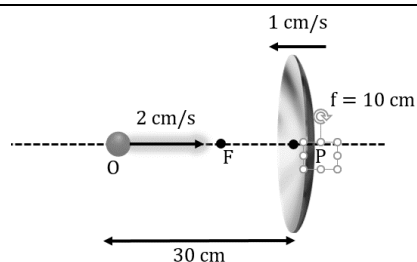
- (A)  $\frac{1}{15}$  m/s                      (B)  $\frac{1}{20}$  m/s                      (C)  $\frac{1}{25}$  m/s                      (D)  $\frac{1}{30}$  m/s

- Q.4** The velocity of the image with respect to ground in the below shown figure will be [Mirror is at rest and velocity of the object (O) is given with respect to ground]



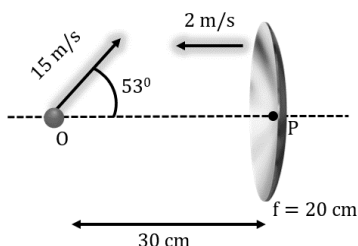
- (A) 45 m/s towards the mirror                      (B) 35 m/s towards the mirror  
(C) 45 m/s away from the mirror                      (D) 35 m/s away from the mirror

- Q.5** Find the velocity of the image of object O with respect to ground in the given figure. The velocities of the object and the mirror w.r.t ground are given.



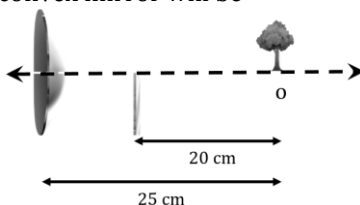
- (A)  $\frac{5}{4}$  c m/s towards the mirror      (B)  $\frac{7}{4}$  c m/s towards the mirror  
 (C)  $\frac{7}{4}$  c m/s away from the mirror      (D)  $\frac{7}{9}$  c m/s away from the mirror

**Q.6** For the given object (O) and mirror arrangement, the velocity (in m/s) of the image with respect to ground will be [All the velocities are given with respect to ground]



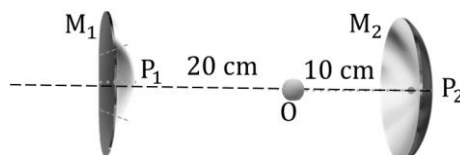
- (A)  $+46\hat{i} - 24\hat{j}$       (B)  $+46\hat{i} + 24\hat{j}$       (C)  $-46\hat{i} - 24\hat{j}$       (D)  $-46\hat{i} + 24\hat{j}$

**Q.7** An object is placed at a distance of 25 cm from the convex mirror and a plane mirror is set such that the image formed by the two mirrors coincide. The plane mirror is placed at 20 cm from the object. The radius of curvature of the convex mirror will be



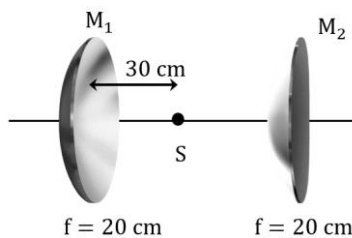
- (A) 25 cm      (B) 50 cm      (C) 60 cm      (D) 75 cm

**Q.8** The focal length of convex mirror  $M_1$  is 20 cm and that of concave mirror  $M_2$  is 30 cm. Find the distance of the second image  $I_2$  from the pole of the mirror  $M_2$ . Consider first reflection to be at  $M_1$ .



- (A) 60 cm      (B) 90 cm      (C) 120 cm      (D) 150 cm

**Q.9** For the given system of mirrors, the image formed after two reflections is on the source S itself. Then, the distance between the two mirrors is (Take first reflection from mirror  $M_2$ )



(A) 70 cm

(B) 60 cm

(C) 40 cm

(D) 50 cm

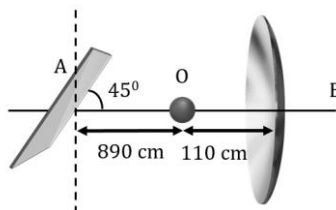
**Q.10** A plane mirror and a concave mirror are arranged as shown in figure and  $O$  is a point object. Find the position of the image formed by two reflections, first one taking place at the concave mirror.

(A) 100 cm above A

(B) 100 cm below A

(C) 50 cm above A

(D) 50 cm below A



## ANSWER KEY

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