

Section : (A) Relative motion

- A-1.** A train is standing on a platform, a man inside a compartment of a train drops a stone. At the same instant train starts to move with constant acceleration. The path of the particle as seen by the person who drops the stone is :
 (A) parabola
 (B) straight line for sometime & parabola for the remaining time
 (C) straight line
 (D) variable path that cannot be defined.
- A-2.** Two trains A & B 100 km apart are travelling towards each other on different tracks with starting speed of 50 km/h for both. The train A accelerates at 20 km/h^2 and the train B retards at the rate 20 km/h^2 . The distance covered by the train A when they cross each other is :
 (A) 45 km (B) 55 km (C) 65 km (D) 60 km
- A-3.** Two particles are moving with velocities v_1 and v_2 . Their relative velocity is the maximum, when the angle between their velocities is :
 (A) zero (B) $\pi/4$ (C) $\pi/2$ (D) π
- A-4.** A car A is going north east at 80 kmh^{-1} and another car B is going south east with a velocity of 60 kmh^{-1} . The velocity of A relative to B makes an angle with the north equal to
 (A) $\tan^{-1}\left(\frac{2}{7}\right)$ (B) $\tan^{-1}\left(\frac{7}{2}\right)$ (C) $\tan^{-1}(7)$ (D) $\tan^{-1}\left(\frac{1}{7}\right)$.
- A-5.** A coin is released inside a lift at a height of 2 m from the floor of the lift. The height of the lift is 10 m. The lift is moving with an acceleration of 11 m/s^2 downwards. The time after which the coin will strike with the lift is :
 (A) 4 s (B) 2 s (C) $\frac{4}{\sqrt{21}}$ s (D) $\frac{2}{\sqrt{11}}$ s
- A-6.** A ship is travelling due east at 10 km/h. A ship heading 30° east of north is always due north from the first ship. The speed of the second ship in km/h is -
 (A) $20\sqrt{2}$ (B) $20\sqrt{3/2}$ (C) 20 (D) $20/\sqrt{2}$
- A-7.** Three ships A, B & C are in motion. The motion of A as seen by B is with speed v towards north – east. The motion of B as seen by C is with speed v towards the north – west. Then as seen by A, C will be moving towards
 (A) north (B) south (C) east (D) west

- A-1. (C) A-2. (D) A-3. (D) A-4. (D) A-5. (A) A-6. (C) A-7. (B)