Q1. 21 January Shift 2

A river of width 200 m is flowing from west to east with a speed of 18 km/h. A boat, moving with speed of 36 km/h in still water, is made to travel one-round trip (bank to bank of the river). Minimum time taken by the boat for this journey and also the displacement along the river bank are ____ and ____ respectively.

(1) 20 s and 100 m (2) 40 s and 0 m (3) 40 s and 200 m (4) 40 s and 100 m

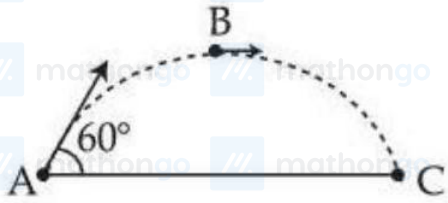
Q2. 22 January Shift 1

A projectile is thrown upward at an angle 60° with the horizontal. The speed of the projectile is 20 m/s when its direction of motion is 45° with the horizontal. The initial speed of the projectile is ____ m/s.

(1) $20\sqrt{2}$ (2) 40 (3) $40\sqrt{2}$ (4) $20\sqrt{3}$

Q3. 23 January Shift 1

An object is projected with kinetic energy K from a point A at an angle 60° with the horizontal. The ratio of the difference in kinetic energies at points B and C to that at point A (see figure), in the absence of air friction is :



(1) 1 : 4 (2) 2 : 3 (3) 3 : 4 (4) 1 : 2

Q4. 24 January Shift 1

A boy throws a ball into air at 45° from the horizontal to land it on a roof of a building of height H. If the ball attains maximum height in 2 s and lands on the building in 3 s after launch, then value of H is ____ m. $\left(g = 10\ m/s^2\right)$

(1) 15 (2) 20 (3) 25 (4) 10

ANSWER KEYS

1. (3) **2.** (1) **3.** (1) **4.** (1)