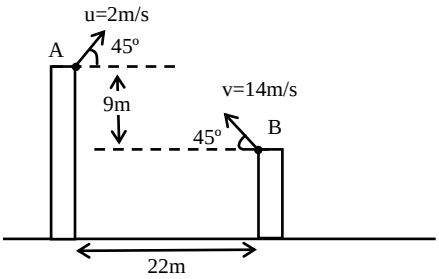
CLASS XI-PHYSICS
PROJECTILE MOTION

ASSIGNMENT-1

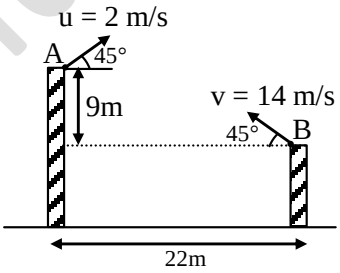
NUMERICAL QUESTIONS:

Q. 1 Two particles are simultaneously thrown from top of two towers as shown. Their velocities are 2m/s and 14m/s. Horizontal and vertical separation between these particles are 22m and 9m respectively. Then the minimum separation between the particles in process of their motion in meters is.



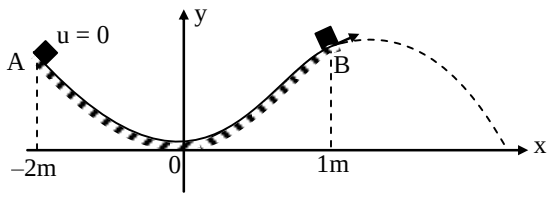
Q.2 The minimum speed in m/s with which a projectile must be thrown from origin at ground so that it is able to pass through a point P (30 m, 40 m) is :($g = 10\ m/s^2$)

Q.3 Two particles are simultaneously thrown from top of two towers as shown. Their velocities are 2 m/s and 14 m/s. Horizontal and vertical separation between these particles are 22 m and 9 m respectively. Then the minimum separation between the particles in process of their motion in meters is ($g = 10\ m/s^2$)



Q.4 A projectile is fixed at an angle 60º with horizontal. Ratio of initial K.E. to K.E when velocity vector of projectile makes an angle 15º with velocity of projection is -

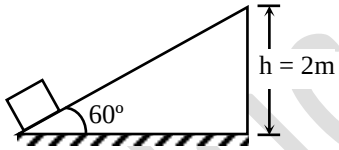
Q.5 A small body is released from point A of smooth parabolic path $y = x^2$, where y is vertical axis and x is horizontal axis at ground as shown. The body leaves the surface from point B. If $g = 10\ m/s^2$ then total horizontal distance in meters travelled by body before it hits ground is.



Q.6 A particle is projected from the bottom of an inclined plane of inclination 30º. At what angle α (from the horizontal) should the particle be projected to get the maximum range on the inclined plane.

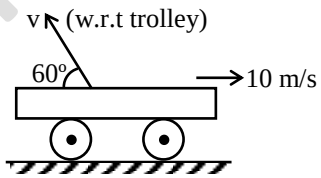
Q.7 A ball is thrown in air making some angle with horizontal. Considering buoyancy due to air which is equal to $\frac{1}{50}$ th weight of the ball, percentage change in range of ball is

Q.8 A block is projected up on smooth inclined plane having angle of inclination 60º with speed $\sqrt{6gh}$. Maximum height (in meter) attained by block is -



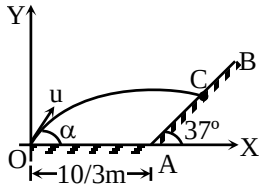
Q.9 A particle is projected towards north with speed 20m/s at an angle 45º with horizontal. Ball get horizontal acceleration of 7.5 m/s^2 towards east due to wind. Range of ball (in meter) minus 42 m will be –

Q.10 For an observer on trolley direction of projection of particle is shown in figure, while for observer on ground ball rises vertically. Maximum height (in meter) reached by ball minus 10m is -

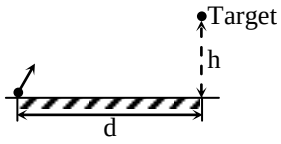


Q.11 Two second after projection a projectile is travelling in a direction inclined at 30º with horizontal, after one more second it is travelling horizontally. Angle of projection (in degree) with horizontal divided by 10 is –

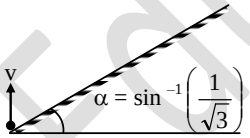
Q.12 A particle is projected from O on the ground with velocity u = 5 $\sqrt{5}$ m/s at angle $\alpha = \tan^{-1}(0.5)$. It strikes at a point C on a fixed plane AB having inclination of 37º with horizontal as shown, then the x-coordinate of point C in meters is (g = 10m/s^2)



Q.13 A particle is projected from ground with minimum speed required to hit a target at a height h = 10 m at a horizontal distance d = $\sqrt{300}$ m as shown. Then find the time taken by particle (in seconds) to hit the target.
($g = 10\ m/s^2$)



Q.14 A particle is projected with initial velocity v = $10\sqrt{2}$ m/s as shown. After elastic collision with the inclined plane the particle rebounds normally with the plane and retraces its path to come back at its point of projection. Then find the time in seconds in which particle returns to the point of projection. ($g = 10\ m/s^2$)



Q.15 A football is thrown with a velocity of 10 m/s at an angle of 30° above the horizontal. What will the time of flight be? ($g = 10\ m/s^2$)

Q.16 The minimum speed divided by 10 in m/s with which a projectile must be thrown from origin at ground so that it is able to pass through a point P (30 m, 40 m) is :($g = 10\ m/s^2$)

Q.17 Two particles are simultaneously thrown from top of two towers as shown. Their velocities are 2 m/s and 14 m/s. Horizontal and vertical separation between these particles are 22 m and 9 m respectively. Then the minimum separation between the particles in process of their motion in meters is ($g = 10\ m/s^2$)