Yakeen NEET 2.0 2026

Physics by MR Sir

Motion in a Plane

DPP: 2

Q1 The speed of a projectile at its maximum height is half of its initial speed. The angle of projection is

(A) 60° (B) 15°

(C) 30° (D) 45°

Q2 A projectile is fired with velocity u at angle θ with horizontal. When the particle makes an angle β with the horizontal, its speed becomes v, v is given by

(A) $v = u\cos\theta \cdot \sec\beta$

(B) $v = u\cos\theta \cdot \sin\beta$

(C) $v = u\cos\theta \cdot \cos\beta$

(D) $v = u\cos\theta \cdot \text{cosec}\,\beta$

Q3 For an object thrown at 45° to horizontal, the maximum height (H) and horizontal range (R) are related as:

(A) R = 16 H (B) R = 8 H

(C) R = 4 H (D) R = 2H

Q4 A large number of bullets are fired in all directions with same speed v. What is the maximum area on the ground on which these bullets will spread ?

(A) $\pi\frac{v^2}{g}$

(B) $\pi\frac{v^4}{g^2}$

(C) $\pi^2\frac{v^4}{g^2}$

(D) $\pi^2\frac{v^2}{g^2}$

Q5 A man fires a large number of bullets in all directions with same speed u. The maximum area on the ground on which these bullets will spread is-

(A) $\frac{\pi u^2}{g}$ (B) $\frac{u^2}{g^2}$

(C) $\frac{\pi u^4}{g^2}$ (D) $\frac{u^4}{g^2}$

Q6 If R is the maximum horizontal range of a particle, then the greatest height attained by it is

(A) R (B) $2R$

(C) $R/2$ (D) $R/4$

Q7 If angles of projection are $\left(\frac{\pi}{4}+\theta\right)$ and $\left(\frac{\pi}{4}-\theta\right)$ where $\theta < \frac{\pi}{4}$, then the ratio of horizontal ranges described by the projectile is (projection speed is same) ;

(A) $2:1$ (B) $1:2$

(C) $1:1$ (D) $2:3$

Q8 Equation of motion of a projectile is

(A) $y = x\tan\theta - \frac{gx^2}{2u^2\cos^2\theta}$

(B) $y = x\tan\theta + \frac{gx^2}{2u^2\cos^2\theta}$

(C) $y = x\sin\frac{gx^2}{2u\cos^2\theta}$

(D) $y = x\sin\theta + \frac{gx^2}{2u^2\cos^2\theta}$

Q9 The motion of a projectile is described by the equation $y = ax - bx^2$. The range of projectile is

(A) a^2/b^2

(B) $a/2b$

(C) a/b
(D) None of the above

Q10 For ground to ground projectile motion equation of path is $y = 12x - \left(\frac{3}{4}\right)x^2$. Given that $g = 10\ \text{ms}^{-2}$. What is the range of the projectile?
(A) $36\ \text{m}$
(B) $30.6\ \text{m}$
(C) $16\ \text{m}$
(D) $12.4\ \text{m}$

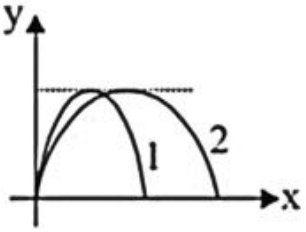
Q11 In a projectile motion, the height y and distance x are given by $y = 4t - 5t^2$ and $x = 3t$. The acceleration due to gravity is given by
(A) 3 units
(B) 10 units
(C) 4 units
(D) 5 units

Q12 A body is thrown horizontal from the top of a tower of height $5\ \text{m}$. It touches the ground at a distance of $10\ \text{m}$ from the foot of the tower. The initial velocity of the body is $\left(g = 10\ \text{ms}^{-2}\right)$
(A) $2.5\ \text{ms}^{-1}$
(B) $5\ \text{ms}^{-1}$
(C) $10\ \text{ms}^{-1}$
(D) $20\ \text{ms}^{-1}$

Q13 A bullet is dropped from the same height when another bullet is fired horizontally. They will hit the ground
(A) One after the other
(B) Simultaneously
(C) Depends on the observer
(D) None of the above

Q14 A bomb is released from a horizontal flying aeroplane. The trajectory of bomb is
(A) a parabola
(B) a straight line
(C) a circle
(D) a hyperbola

Q15 Trajectories of two projectiles are shown in figure. Let T_1 and T_2 be the time of flight and u_1 and u_2 their speeds of projection. Then



(A) $T_2 > T_1$
(B) $T_1 = T_2$
(C) Both (2) and (4)
(D) $u_1 < u_2$

Answer Key

Q1 (A)
Q2 (A)
Q3 (C)
Q4 (B)
Q5 (C)
Q6 (D)
Q7 (C)
Q8 (A)
Q9 (C)
Q10 (C)
Q11 (B)
Q12 (C)
Q13 (B)
Q14 (A)
Q15 (C)