Yakeen NEET 2.0 2026

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DPP: 3

Motion in a Plane

Q1 If the time of flight of a bullet over a horizontal range R is T, then the angle of projection with horizontal is

(A) $\tan^{-1}\left(\frac{gT^2}{2R}\right)$

(B) $\tan^{-1}\left(\frac{2R^2}{gT}\right)$

(C) $\tan^{-1}\left(\frac{2R}{g^2T}\right)$

(D) $\tan^{-1}\left(\frac{2R}{gT}\right)$

Q2 A particle is projected from the ground with velocity u at angle θ with horizontal. The horizontal range, maximum height and time of flight are R, H and T respectively. They are given by, $R = \frac{u^2 \sin 2\theta}{g}$,

$\mathrm{H} = \frac{\mathrm{u}^2 \sin^2 \theta}{2\mathrm{g}}$ and $\mathrm{T} = \frac{2\mathrm{usin}\theta}{\mathrm{g}}$

Now keeping u as fixed, θ is varied from 30° to 60°. Then,

(A) R will first increase then decrease, H will increase and, T will decrease

(B) R will first increase then decrease while H and T both will increase

(C) R will decrease while H and T will increase

(D) R will increase while H and T will increase

Q3 The range of a projectile for a given velocity is maximum when the angle of projection is 45°. The range will be minimum, if the angle of projection is

(A) 90°

(B) 180°

(C) 60°

(D) 75°

Q4 The horizontal range is four times the maximum height attained by a projectile. The angle of projection is

(A) 90°

(B) 60°

(C) 45°

(D) 30°

Q5 A football player throws a ball with a velocity of 50 metre/sec at an angle 30 degrees from the horizontal. The ball remains in the air for $\left(g = 10\ \mathrm{m/s^2}\right)$

(A) $2.5\mathrm{sec}$

(B) $1.25\mathrm{sec}$

(C) $5\mathrm{sec}$

(D) $0.625\mathrm{sec}$

Q6 A projectile is projected from the foot of incline of angle 30° with the velocity $30\ \mathrm{ms}^{-1}$. The angle of projection as measured from the horizontal is 60°. The speed of the projectile when it will be moving parallel to incline is

(A) $10\ \mathrm{ms}^{-1}$

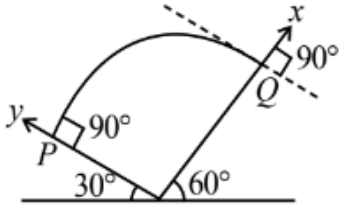
(B) $2\sqrt{3}\ \mathrm{ms}^{-1}$

(C) $5\sqrt{3}\ \mathrm{ms}^{-1}$

(D) $10\sqrt{3}\ \mathrm{ms}^{-1}$

Q7 Two incline plane of angle 30° and 60° are placed touching each other at the base as shown

in the figure. A projectile is projected with speed of $10\sqrt{3}\ \text{ms}^{-1}$ from point P as shown and hits the other inclined at point Q normally.



If the co-ordinate are taken along the inclines as shown in the figure, then ;

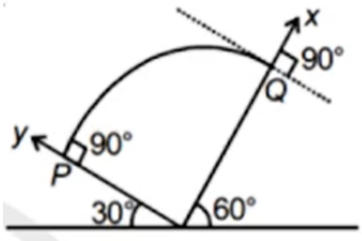
(A) Component of acceleration in x-direction is $-5\sqrt{3}\ \text{ms}^{-2}$

(B) Component of acceleration in x-direction is $-10\sqrt{3}\ \text{ms}^{-2}$

(C) Component of acceleration in y-direction is $-5\sqrt{3}\ \text{ms}^{-2}$

(D) Component of acceleration in y-direction is $-10\sqrt{3}\ \text{ms}^{-2}$

Q8 Two incline plane of angle 30° and 60° are placed touching each other at the base as shown in the figure. A projectile is projected with speed of $10\sqrt{3}\ \text{ms}^{-1}$ from point P as shown and hits the other inclined at point Q normally.
If the co-ordinate are taken along the inclines as shown in the figure, then The time of flight in the above problem is



(A) $1\ \text{s}$

(B) $2\ \text{s}$

(C) $3\ \text{s}$

(D) $4\ \text{s}$

Q9 At the top of the trajectory of a projectile, the acceleration is

(A) Maximum (B) Minimum

(C) Zero (D) g

Q10 A body is thrown at an angle 30° to the horizontal with the velocity of $30\ \text{m/s}$. After 1sec, its velocity will be (in m/s) $\left(g = 10\ \text{m/s}^2\right)$

(A) $10\sqrt{7}$

(B) $700\sqrt{10}$

(C) $100\sqrt{7}$

(D) $\sqrt{10}$

Answer Key

Q1	(A)	Q6	(D)
Q2	(B)	Q7	(A)
Q3	(A)	Q8	(B)
Q4	(C)	Q9	(D)
Q5	(C)	Q10	(A)