DPP - 6

Q 1. On an inclined plane of inclination 30°, a ball is thrown at an angle of 60° with the horizontal from the foot of the incline with a velocity of $10\sqrt{3}$ m/s. If g = 10 m/s^2, hen find the time in which ball will hit the inclined plane?

(a) 1 s   (b) 2 s   (c) 3 s   (d) 4 s

Q 2. Two bodies are projected from the same point with equal speeds in such a directions that they strike on the same point on a plane whose inclination is b. If a the angle of projection of the first, ratio of there times of flight is

(a) $\frac{\sin\alpha}{\cos\beta}$ (b) $\frac{\sin\alpha}{\sin\beta}$ (c) $\frac{\sin(\alpha-\beta)}{\cos\beta}$ (d) $\frac{\sin(\alpha-\beta)}{\cos\alpha}$

Q 3. A baseball is projected with a velocity v making an angle θ with the incline of indication α as shown in fig. Find the condition that the ball hits the incline at right angle.


(a) cot θ = 2 tan α   (b) sin θ = cos α
(c) tan θ = sin α   (d) cot θ = cos α
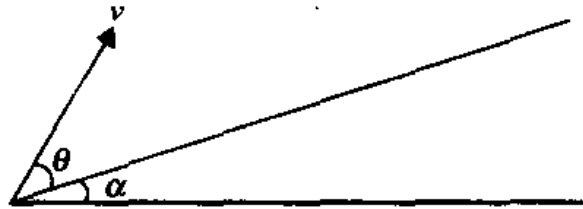
Q 4. A projectile is required to hit a target whose coordinates relative to horizontal and vertical axes through the point of projection are (α, β). If the gun velocity is $\sqrt{2g\alpha}$, it is impossible to hit the target if

(a) β > 3α/4   (b) β ≥ 1α/4
(c) β ≤ 3α/4   (d) β ≥ 3α/4

Q 5. A marble rolls down from top of a staircase with constant horizontal velocity 10 m/s. If each step is y = 1 meter high and x = 1 meter wide. To which step the marble will strike directly? (g = 9.8 m/s^2)
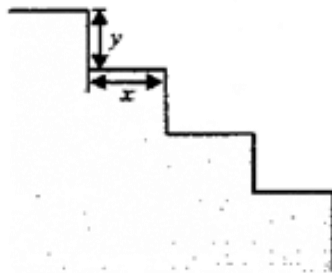

(a) 21st (b) 8th
(c) 10th (d) 18th

Q 6. A particle is projected from origin of coordinate system. A target is fixed at point (40m, 30m). Find the minimum velocity of projectile to hit the target? (g = 10 m/s^2)

(a) $10 \, m/s$ (b) $17 \, m/s$
(c) $20\sqrt{2} \, m/s$ (d) $10\sqrt{5} \, m/s$

Q 7. A particle is projected at an angle θ with an inclined plane making an angle β with the horizontal as shown in figure, speed of the particle is u, after time t find y component of velocity when particle is at maximum distance from the incline plane ?
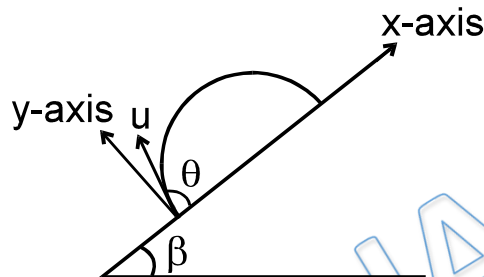
(a) $\frac{u}{\sqrt{2}}$ (b) $\frac{2u}{\sqrt{3}}$
(c) $\frac{\sqrt{2}u}{3}$ (d) zero

Q 8. A ball is projected from point A with a velocity 10 m/s perpendicular to the inclined plane as shown in figure. Range of the ball on the inclined plane is :
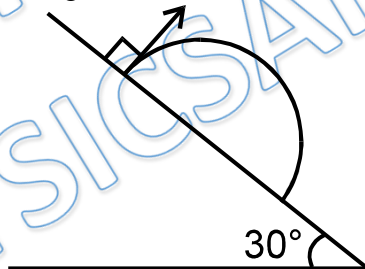
(a) $\frac{40}{3}$ m (b) $\frac{20}{13}$ m
(c) $\frac{13}{20}$ m (d) $\frac{13}{40}$ m

Q 9. A plane surface is inclined making an angle θ with the horizontal. From the bottom of this inclined plane, a bullet is fired with velocity v. The maximum possible range of the bullet on the inclined plane is

(a) $\frac{v^2}{g}$ (b) $\frac{v^2}{g(1+\sin\theta)}$
(c) $\frac{v^2}{g(1-\sin\theta)}$ (d) $\frac{v^2}{g(1+\cos\theta)}$

Q 10. A ball is projected horizontal with a speed v from the top of a plane inclined at an angle 45° with the horizontal. How far from the point of projection with the ball strike the plane?

(a) $\frac{V^2}{g}$ (b) $\sqrt{2}\frac{V^2}{g}$ (c) $\frac{2V^2}{g}$ (d) $\sqrt{2}\left[\frac{2V^2}{g}\right]$

Q 11. Two inclined planes OA and OB having inclination with horizontal) 30° and 60° respectively, intersect each other at O as shown in figure. A particle is projected from point P with velocity $u = 10\sqrt{3}$ m/s Along a direction perpendicular to plane OA. If the particle strikes plane OB perpendicularly at Q, calculate Velocity with which particle strikes the plane OB? (g = 10 m/s^2)
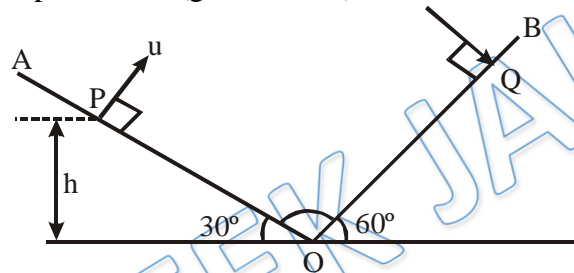

(a) 10 m/s   (b) $10\sqrt{3}$ m/s
(c) $\sqrt{3}$ m/s   (d) $5\sqrt{3}$ m/s

Q 12. A particle P is projected from a point on the surface of smooth inclined plane (see figure). Simultaneously another particle Q is released on the smooth inclined plane from the same position. P and Q collide after t = 4 second. The speed of projection of P is :-
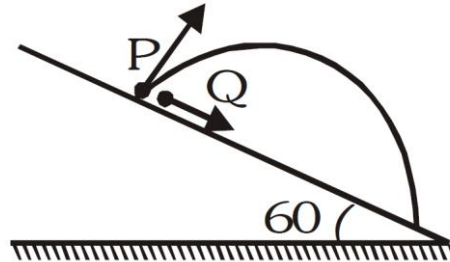
(a) 5 m/s   (b) 10 m/s
(c) 15 m/s   (d) 20 m/s

Q 13. A ball is projected on smooth inclined plane in direction perpendicular to line of greatest slope with velocity of 8m/s. Find it's speed after 1 sec.
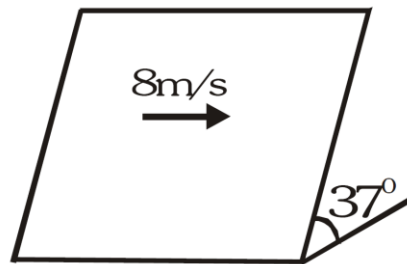
(a) 10 m/s   (b) 12 m/s
(c) 15 m/s   (d) 20 m/s

Q 14. A particle is projected from a point P(2,0,0)m with a velocity 10m/s making an angle 45° with the horizontal. The plane of projectile motion passes through a horizontal line PQ which makes an angle of 37° with positive x–axis, xy plane is horizontal. The coordinates of the point where the particle will strike the li ne PQ is : -(take g = 10 m/s^2)

(a) (10,6,0)m   (b) (8,6,0)m   (c) (10,8,0)m   (d) (6,10,0)m

Solution on Website:-   https://physicsaholics.com/home/courseDetails/52

Solution on YouTube:-   https://youtu.be/F0BVSYJhp_k

Answer Key

Q.1	b	Q.2	d	Q.3	a	Q.4	a	Q.5	a
Q.6	c	Q.7	d	Q.8	a	Q.9	b	Q.10	d
Q.11	a	Q.12	b	Q.13	a	Q.14	a		