DPP – 6

Video Solution on Website:- https://physicsaholics.com/home/courseDetails/41

Video Solution on YouTube:- https://youtu.be/j4jjZ_XFZgA

Q 1. A projectile is projected upward with speed 2 m/s on an incline plane of inclination 30^0 at an angle of 15^0 from the plane. Then the distance along the plane where projectile will fall is:

(a) $\frac{4}{15}$

(b) $\frac{4}{5}\left(\frac{1}{\sqrt{3}}+\frac{1}{3}\right)$

(c) $\frac{4}{5}\left(\frac{1}{\sqrt{3}}-\frac{1}{3}\right)$

(d) $\frac{4}{\sqrt{3}}\left(\frac{1}{\sqrt{3}}-\frac{1}{3}\right)$

Q 2. A projectile is projected with speed u at an angle of 60^0 with horizontal from the foot of an inclined plane. If the projectile hits the inclined plane horizontally, the range on inclined plane will be:
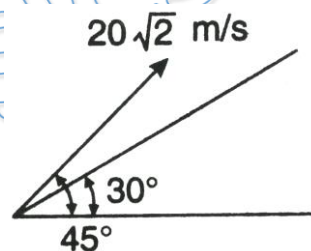
(a) $\frac{u^2(\sqrt{21})}{2g}$

(b) $\frac{3u^2}{4g}$

(c) $\frac{u^2}{2g}$

(d) $\frac{u^2(\sqrt{21})}{8g}$

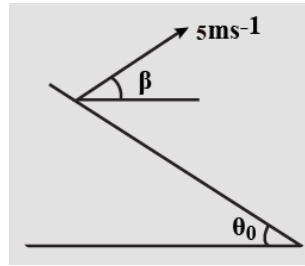Q 3. Find time of flight of the projectile along the inclined plane as shown in figure: $(g = 10 \, m/s^2)$

(a) $2 \, sec$

(b) $1.69 \, sec$

(c) $2.69 \, sec$

(d) $1 \, sec$

Q 4. An inclined plane makes an angle $\theta_o = 30^0$ with the horizontal. A particle is projected from this plane with a speed of 5 m/s at an angle of elevation $\beta = 30^0$ with the horizontal as shown in Fig. Find the range of the particle on the plane when it strikes the plane: $(g = 10 \, m/s^2)$

(a) $5\ m$

(b) $\frac{5}{3}\ m$

(c) $\frac{5}{2}\ m$

(d) $\frac{2}{5}\ m$

Q 5. Find time of flight of the projectile along the inclined plane as shown in figure: $(g = 10\ m/s^2)$
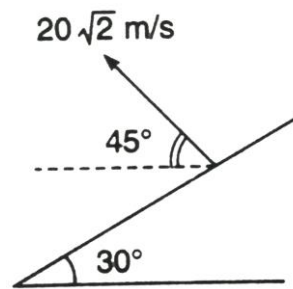
(a) $5\ sec$

(b) $6.31\ sec$

(c) $3.31\ sec$

(d) $2.21\ sec$

Q 6. A particle is projected with a velocity of 30 m/s at an angle $60°$ above the horizontal on a slope of inclination $30°$. Find its range and time of flight: $(g = 10\ m/s^2)$

(a) $30\ m,\ \sqrt{3}\ s$

(b) $30\ m,\ 2\sqrt{3}\ s$

(c) $60\ m,\ 2\sqrt{3}\ s$

(d) $60\sqrt{3}\ m,\ 2\ s$

Q 7. A particle is projected with a velocity of 30 m/s at an angle $60°$ above the horizontal on a slope of inclination $30°$. Find its angle of hit: $(g = 10\ m/s^2)$

(a) 30^0

(b) 60^0

(c) 90^0

(d) 45^0

Q 8. A projectile is fired horizontally from an inclined plane (of inclination 45^0 with horizontal) with speed = 50 m/s. if $g = 10\ m/s^2$, the range measured along the incline is:

(a) $500\ m$

(b) $500\sqrt{2}\ m$

(c) $200\sqrt{2}\ m$

(d) none of these

Q 9. An inclined plane is making an angle β with horizontal. A projectile is projected from the bottom of the plane with a speed u at an angle α with horizontal then its maximum range R_{max} is:

(a) $R_{max} = \dfrac{u^2}{g(1-\sin\beta)}$

(b) $R_{max} = \dfrac{u^2}{g(1+\sin\beta)}$

(c) $R_{max} = \dfrac{u}{g(1-\sin\beta)}$

(d) $R_{max} = \dfrac{u}{g(1+\sin\beta)}$

Q 10. A particle is projected from the bottom of an inclined plane of inclination 30^0. At what angle α (from the horizontal) should the particle be projected to get the maximum range on the inclined plane.
(a) 15^0 (b) 30^0
(c) 45^0 (d) 60^0

Answer Key

Q.1) c	Q.2) d	Q.3) b	Q.4) a	Q.5) b
Q.6) c	Q.7) b	Q.8) b	Q.9) b	Q.10) d