When an object is shot from the bottom of a long smooth inclined plane kept at an angle 60° with horizontal, it can travel a distance X1, along the plane. But when the inclination is decreased to 30° and the same object is shot with the same velocity, it can travel X2 distance. Then x1 : x2 will be
(a) 1:23
(b) 1:2
(d) 1:3
(c) 2:1
(NEET 2019)

The speed of a swimmer in still water is 20 m/s. The speed of river water is 10 m/s and is flowing due east. If he is standing on the south bank and wishes to cross the river along the shortest path, the angle at which he should make his strokes w.r.t. north is, given by

(a) 45° west

(c) 0°

(b) 30° west

(d) 60° west

(NEET 2019)

19. The speed of a swimmer in still water is 20 m/s. The speed of river water is 10 m/s and is flowing due east. If he is standing on the south bank and wishes to cross the river along the shortest path, the angle at which he should make his strokes w.r.t. north is, given by
(a) 45° west (b) 30° west
(c) 0° (d) 60° west *(NEET 2019)*

20. Two boys are standing at the ends A and B of a ground where $AB = a$. The boy at B starts running in a direction perpendicular to AB with velocity v_1. The boy at A starts running simultaneously with velocity v and catches the other in a time t, where t is
(a) $\frac{a}{\sqrt{v^2 + v_1^2}}$ (b) $\frac{a}{v + v_1}$
(c) $\frac{a}{v - v_1}$ (d) $\sqrt{\frac{a^2}{v^2 - v_1^2}}$ *(2005)*

The position vector of a particle R as a function of time is given by R=4 sin(2πt) î+ 4 cos(2лt) where R is in meters, t is in seconds and î and denote unit vectors along x-and y-directions, respectively. Which one of the following statements is wrong for the motion of particle?

(a) Magnitude of the velocity of particle is 8 π meter/second.

(b) Path of the particle is a circle of radius 4 meter. (c) Acceleration vector is along -R.

R (d) Magnitude of acceleration vector is is the velocity of particle. where v (2015)

A particle is moving such that its position coordinates (x, y) are (2 m, 3 m) at time t = 0, (6 m, 7 m) at time t = 2 s and (13 m, 14 m) at time t = 5 s. Average velocity vector (vay) from t = 0 to t = 5 s is

(a) (137+14)) 5

(c) 2(î+j)

(b) — (î + 1) 3

A (d) 1/1 (1 + 3) 5

(2014)

The x and y coordinates of the particle at any time are $x = 5t - 2t^2$ and $y = 10t$ respectively, where x and y are in metres and t in seconds. The acceleration of the particle at t = 2 s is

(a) 5 ms^{-2}

(c) -8 m s-2

(b) -4 m s^{-2}

(d) o

(NEET 2017)

The position vector of a particle R as a function of time is given by R = 4 sin(2πt) î+ 4 cos(2πt)} where R is in meters, t is in seconds and î and denote unit vectors along x-and y-directions, respectively. Which one of the following statements is wrong for the motion of particle?

(a) Magnitude of the velocity of particle is 8 meter/second.

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(c) Acceleration vector is along -Ŕ.

(d) Magnitude of acceleration vector is is the velocity of particle. where v (2015)

Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time t_1. On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time t_2. The time taken by her to walk up on the moving escalator will be

(a) $t_1 t_2 / t_2 - t_1$

(c) $t_1 - t_2$

(b) $t_1 t_2 / t_1 + t_2$

(d) $(t_1 + t_2)/2$

(NEET 2017)

A bus is moving with a speed of 10 ms^{1} on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus?

(a) 40 m s

(c) 10 m s^{1}

(b) 25 m s^{1}

(d) 20 m s^{-1}

(2009)

A train of 150 metre length is going towards north direction at a speed of 10 m/s. A parrot flies at the speed of 5 m/s towards south direction parallel to the railways track. The time taken by the parrot to cross the train is

(a) 12 s

(b) 8 s

(c) 15 s

(d) 10 s

(1988)

A body dropped from top of a tower fall through 40 m during the last two seconds of its fall. The height of tower is (g = 10 m/s^2)

(a) 60 m

(c) 80 m

(b) 45 m

(d) 50 m

(1992)

44. What will be the ratio of the distance moved by a freely falling body from rest in 4th and 5th seconds of journey?

(a) 4:5

(c) 16:25

(b) 7:9

(d) 1 : 1.

(1989)

45. A car is moving along a straight road with a uniform acceleration. It passes through two points P and Q separated by a distance with velocity 30 km/h and 40 km/h respectively. The velocity of the car midway between P and Q is

(a) 33.3 km/h

(c) 25√2 km/h

(b) 20√/2 km/h

(d) 35 km/h.

(1988)

A projectile is fired from the surface of the earth with a velocity of 5 ms and angle 8 with the horizontal. Another projectile fired from another planet with a velocity of 3 ms at the same angle follows a trajectory which is identical with the trajectory of the projectile fired from the earth. The value of the acceleration due to gravity on the planeti is (in ms) is (Given g -9.8 ms)

(a) 3.5 (b) 5.9 (c) 16.3 (d) 110.8 (2014)

A particle A is dropped from a height and another particle B is projected in horizontal direction with speed of 5 m/s from the same height then correct statement is

(a) particle A will reach at ground first with respect to particle i B (b) particle B will reach at ground first with respect

to particle A

(c) both particles will reach at ground simultaneously (d) both particles will reach at ground with same

speed.

(2002)

34. Two projectiles of same mass and with same velocity are thrown at an angle 60 and 30° with the horizontal, then which will remain same

(a) time of flight (b) range of projectile

(c) maximum height acquired

(d) all of them.

(2000)

35. If a body A of mass M is thrown with velocity v at an angle of 30° to the horizontal and another body 8 of the same mass is thrown with the same speed at an angle of 60° to the horizontal, the ratio of horizontal range of A to B will be

(a) 1:3 (c) 1:√√3

(b) 1:1 (d) √3:1.

(1992, 1990)