Shiksha Classes Bhandara
CHAPTER TEST

Subject : Physics **Topic : Projectile Motion** **M.M. : 100**

Marking Scheme:

(i) Each question is allotted 4 (four) marks for each correct response.

(ii) ¼ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.

Q.1 A particle of mass 0.01 kg is projected with velocity from point (x = 0, y = 20). After 2s, its position coordinates will be –
(A) 4, 0 (B) 4, – 20
(C) 0, 4 (D) 4, 20

Q.2 If maximum height and range of a projectile are same, what is the angle of projection –
(A) 30° (B) 76°
(C) 50° (D) 90°

Q.3 An arrow is shot into air. Its range is 200m and its time of flight is 5s. If g = 10 m/s^2, then the horizontal component of velocity of the arrow is –
(A) 12.5 m/s (B) 25 m/s
(C) 31.25 m/s (D) 40 m/s

Q.4 Two stones are projected with the same speed but making different angles with the horizontal. Their horizontal ranges are equal. The angle of projection of one is $\pi/3$ and the maximum height reached by it is 102m. Then the maximum height reached by the other in metres is –
(A) 336 (B) 224
(C) 56 (D) 34

Q.5 The height y and the distance x along the horizontal plane of a projectile on a certain planet (with no surrounding atmosphere) are given by y = (8t – 5y^2) metre and x = 6t metre where t is in seconds. The velocity of projection is –
(A) 8m/s
(B) 6 m/s
(C) 10 m/s
(D) not obtained from the data

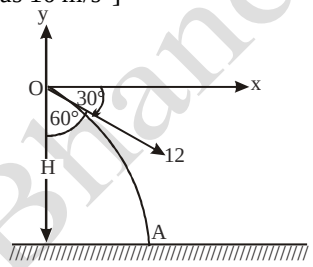
Q.6 A cricket ball is hit at 30° with the horizontal with kinetic energy K. The kinetic energy at the highest point is-
(A) 0 (B) K/4
(C) K/2 (D) 3K/4

Q.7 Two projectiles are fired from the same point with the same speed at angles of projection 60° and 30° respectively. Which one of the following is true –
(A) Their maximum height will be same
(B) Their range will be same
(C) Their landing velocity will be same
(D) Their time of flight will be same

Q.8 From a 10m high building a stone A is dropped and simultaneously another identical stone B is thrown horizontally with an initial speed of 5 m/s. Which one of the following statements is true –
(A) It is not possible to calculate which one of the two stones will reach the ground first.
(B) Both the stone (A and B) will reach the ground simultaneously.
(C) A stone reaches the ground earlier with B.
(D) B stone reaches the ground earlier with A

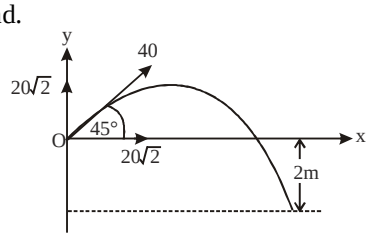
Q.9 For angles of projection of a projectile (45° – θ) and (45° + θ), the horizontal ranges described by the projectile are in the ratio of–
(A) 1 : 3 (B) 1 : 2
(C) 2 : 1 (D) 1 : 1

Q.10 A stone is thrown from the top of a tower which is 11m high and stands on horizontal ground. The speed of projection is 12 m/s and the initial direction of motion is at 60° to the downward vertical. Find the time taken for the stone to reach the ground. [Take g as 10 m/s^2]



(A) 1 sec (B) 2.2 sec
(C) 3 sec (D) 3.4 sec

Q.11 A particle is projected from a point which is 2m above ground level with a velocity of 40 m/s at an angle of 45° to the horizontal. Find its horizontal distance from the point of projection when it hits the ground.



(A) 120m (B) 165m
(C) 250m (D) 160m

Q.12 A jogger runs with constant velocity v through a forest of coconut trees. A coconut starts to fall from a height h when the jogger is directly below it. How far behind the jogger will the coconut land ?

(A) $\sqrt{\frac{2hv^2}{g}}$ (B) $\sqrt{\frac{hv^2}{2g}}$

(C) $\frac{gh^2}{2v^2}$ (D) $\frac{2gh^2}{v^2}$

Q.13 A ball is rolled off along the edge of horizontal table with velocity 4m/s. It hits the ground after time 0.4 s. Which one of the following is wrong –
(A) The height of the table is 0.8m.
(B) It hits the ground at an angle of 60° with the vertical.
(C) It covers a horizontal distance 1.6m from the table.

(D) It hits the ground with vertical component of velocity being 4 m/s.

Q.14 A cannon on a level plane is aimed at an angle θ above the horizontal and a shell is fired with a muzzle velocity v_0 towards a vertical cliff a distance D away. Then the height from the bottom at which the shell strikes the side walls of the cliff is-

(A) $D \sin\theta - \frac{gD^2}{2v_0^2 \sin^2\theta}$ (B) $D \cos\theta - \frac{gD^2}{2v_0^2 \cos^2\theta}$

(C) $D \tan\theta - \frac{gD^2}{2v_0^2 \cos^2\theta}$ (D) $D \tan\theta - \frac{gD^2}{2v_0^2 \sin^2\theta}$

Q.15 A ball is thrown up at an angle with the horizontal. Then the total change of momentum by the instant it returns to ground is–

(A) acceleration due to gravity × total time of flight
(B) weight of the ball × half the time of flight
(C) weight of the ball × total time of flight
(D) weight of the ball × horizontal range

Q.16 A gun has a muzzle velocity of 200 m/s (i.e. a shell leaves the gun with an initial speed of 200 m/s). Find the horizontal range of the gun when the angle of projection is 30°.

(A) 3460m (B) 3260m
(C) 4000m (D) 3000m

Q.17 A ball is projected horizontally 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.18 A stone is projected from the ground with velocity 25 m/s. Two seconds later, it just clears a wall 5m high. The angle of projection of the stone is ($g = 10\ m/sec^2$)

(A) 30º (B) 45º
(C) 50.2º (D) 60º

Q.19 A stone is projected from the ground with velocity 50 m/s at an angle of 30º. It crosses a wall after 3 sec. How far beyond the wall the stone will strike the ground ($g = 10\ m/sec^2$)

(A) 90.2 m (B) 89.6 m
(C) 86.6 m (D) 70.2 m

Q.20 An aeroplane moving horizontally at a speed of 200 m/s and at a height of 8.0×10^3 m is to drop a bomb on a target. At what horizontal distance from the target should the bomb be released-

(A) 7.234 km (B) 8.081 km
(C) 8.714 km (D) 9.124 km

For Q.21-Q.25 :

The answer to each question is a NUMERICAL VALUE.

Q.21 A football player kicks a ball at an angle of 30º with the horizontal with a velocity of 60 m/s. The maximum height (in m) reached by the ball is -

Q.22 A particle is projected at angle 37° with the incline plane in upward direction with speed 10 m/s. The angle of incline plane is given 53°. Then the maximum height (in m) attained by the particle from the incline plane will be –

Q.23 A body is projected downwards at an angle of 30º to the horizontal with a velocity of 9.8 m/s from the top of a tower 29.4 m high. How long will it take before striking the ground-

Q.24 A ball is thrown from the top of a tower with an initial velocity of 10 m/s at an angle of 30º above the horizontal. It hits the ground at a distance of 17.3 m from the base of the tower. The height (in m) of the tower ($g = 10\ m/s^2$) will be

Q.25 The range of the particle when launched at an angle of 15º with the horizontal is 1.5 km. What is the range (in km) of the projectile when launched at an angle of 45º to the horizontal.