

DPP - 5

1. A body is dropped from a height h under acceleration due to gravity g . If t_1 and t_2 are time intervals for its fall for first half and the second half distance, the relation between them is
 (A) $t_1 = t_2$ (B) $t_1 = 2t_2$ (C) $t_1 = 2.414t_2$ (D) $t_1 = 4t_2$
2. Two bodies of different masses m_a and m_b are dropped from two different heights, viz a and b . The ratio of times taken by the two to drop through these distances is
 (A) $a : b$ (B) $\frac{m_a}{m_b} : \frac{b}{a}$ (C) $\sqrt{a} : \sqrt{b}$ (D) $a^2 : b^2$
3. A body is thrown upward and reaches its maximum height. At that position-
 (A) its velocity is zero and its acceleration is also zero
 (B) its velocity is zero but its acceleration is maximum
 (C) its acceleration is minimum
 (D) its velocity is zero and its acceleration is the acceleration due to gravity
4. A ball is thrown upwards from the foot of a tower. The ball crosses the top of the tower twice after an interval of 4 second and the ball reaches ground after 8 seconds then the height of tower in meters is.
 (A) 20 m (B) 30 m (C) 60 m (D) 50 m
5. A ball is thrown upward from the edge of a cliff with an initial velocity of 6 m/s. How fast is it moving $1/2$ s later? ($g = 10 \text{ m/s}^2$)
 (A) 2 m/s (B) 3 m/s (C) 4 m/s (D) 1 m/s
6. A particle is thrown upward from ground. It experiences a constant resistive force which can produce retardation of 6 m/sec^2 . What will be the ratio of time of descent to time of ascent ($g = 10 \text{ m/sec}^2$)
 (A) 2 (B) 3 (C) 4 (D) 1
7. A particle is thrown upwards from ground. It experiences a constant air resistance force which can produce retardation 2 m/s^2 . The ratio of time of ascent to the time of descent is: [$g = 10 \text{ m/s}^2$]
 (A) 1:1 (B) $\sqrt{\frac{2}{3}}$ (C) $\frac{2}{3}$ (D) $\sqrt{\frac{3}{2}}$
8. A ball is thrown vertically upward from a height of 40 m and hits the ground with a speed that is three times its initial speed. What is the total time (in sec) of flight?
 (A) 2sec (B) 3sec (C) 4sec (D) 8sec
9. If a body travels half its total path in the last second of its fall from rest, find the time and height of its fall. Take $g = 10 \text{ m/s}^2$

10. A person sitting on the top of a tall building is dropping balls at regular intervals of one second. Find the positions of the 3rd, 4th and 5th ball when the 6th ball is being dropped. Take $g = 10 \text{ m/s}^2$
11. A small parachute dropped from a 30 m high cliff falls freely under gravity for 1.0 s and then attains a terminal velocity 1.2 m/s. 20.0 s later a stone is dropped from the cliff. Will the stone catch up with the parachute before it reaches the ground ? (Take $g = 10 \text{ m/s}^2$)
12. A balloon is going up with a uniform speed 20 m/s. It was at a height of 100 m from ground, when a stone is dropped from its basket. Find the time taken by the stone to reach the ground and the height of the balloon from the ground, when stone hits the ground. (Take $g = 10 \text{ m/s}^2$)
13. From the foot of a tower 90 m high, a stone is thrown up so as to reach the top of the tower. Two second later another stone is dropped from the top of the tower. Find when and where two stones meet. (Take $g = 10 \text{ m/s}^2$)
14. A girl is standing in an elevator that is moving upward at a velocity of 5 m/s and acceleration 2 m/s^2 , when she drops her handbag. If she was originally holding the bag at a height of 1.5 m above the elevator floor, how long will it take the bag to hit the floor.

ANSWER KEY

1. (C) 2. (C) 3. (D) 4. (C) 5. (D) 6. (A) 7. (B)
8. (C) 9. (3.4 s) 10. (5 m) 11. (22.45 s) 12. (237.8 m) 13. (83.82 m)
14. (0.5 s)

