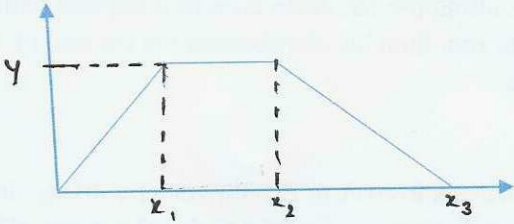


PHYSICS SAMPLE PAPER 2
(MOTION IN ONE DIMENSION)

Marks: 25marks

Time: 90min

1. The average velocity of a body moving with uniform acceleration after travelling a distance 6.12m is 0.68ms^{-1} . If the change in velocity of the body is 0.36ms^{-1} during this time its acceleration is:
(a) 0.04ms^{-2} (c) 0.05ms^{-2}
(b) 0.38ms^{-2} (d) 0.52ms^{-2}
2. A boy throwing balls upwards. He throws next ball when previous one reaches the maximum height. If he throws each ball after 2 sec, then height to which ball rises ($g=10\text{ms}^{-2}$)
(a) 10m (c) 30m
(b) 20m (d) 15m
Type equation here.
3. A car accelerates from rest for time t_1 at a constant rate a_1 and then it retards at the constant rate a_2 for time t_2 and comes to rest Then t_1/t_2 will be:
(a) a_1/a_2 (c) a_1^2/a_2^2
(b) a_2/a_1 (d) a_2^2/a_1^2
4. A particle at rest starts moving in a horizontal straight line with uniform acceleration. The ratio of the distance covered during the fourth and the third second will be:
(a) 4:3 (c) 7:5
(b) 27:4 (d) 2:1
5. A stone is thrown vertically upwards with a velocity of 25ms^{-1} from the top of a tower of height 30m. How long will it travel before it hits the ground? ($g=10\text{ms}^{-2}$)
(a) 6s (c) 4s
(b) 5s (d) 12s
6. A boy runs along the circumference of a circular path of radius R and completes one revolution in 40s. If he continues to run, then his displacement at the end of 140 sec will be:
(a) Zero (d) $\frac{5}{2}\pi R$
(b) 2R
(c) $2\pi R$
7. A particle travels from A to B with velocity 40ms^{-1} in 5s. if it returns from B to A with 60ms^{-1} (uniform motion) then displacement of the body after 6 sec will be:
(a) 120m (c) 60m
(b) 40m (d) 140
8. A body is moving with uniform acceleration. If the velocity after 5sec is 25ms^{-1} and after 10sec is 40ms^{-1} the distance it will cover in the 12th sec is
(a) 38.5m (c) 44.5m
(b) 50m (d) 34.5
9. A ball is dropped from a height of 400m and at the same time another ball is projected from ground vertically upwards with a velocity of 100ms^{-1} . Then the two balls will meet after
(a) 1s (c) 4s
(b) 2s (d) 6s

10. The motion of particle along a straight line is represented by the equation $v = 4\sqrt{1 + S}$ where velocity v is in ms^{-1} and displacement S in m. Then the acceleration of the particle is
- (a) 8ms^{-2} (b) 4ms^{-2} (c) 16ms^{-2} (d) 20ms^{-2}
11. Two balls are dropped from different heights. The second ball is dropped 2s after the first but they both reach the ground at the same time. If the first ball takes 5s to reach the ground, then the difference in the initial height will be:
- (a) 20m (b) 80m (c) 170m (d) 40m
12. A particle starting from the origin (0, 0) moves in a straight line in (x, y) plane. Its co-ordinates at a later time are $(\sqrt{3}, 3)$. The path of the particle makes with x-axis an angle of
- (a) 45° (b) 60° (c) 0° (d) 30°
13. A particle is projected vertically upward. If at 10 and 16 seconds after projecting the particle is at the same height while ascending and descending respectively. The velocity of projection is ($g = 10\text{ms}^{-2}$)
- (a) 260ms^{-1} (b) 160ms^{-1} (c) 130ms^{-1} (d) 110ms^{-1}
14. The acceleration of a particle increases linearly with time so that $a = \alpha t$, α being a constant. The initial velocity at $t = 0$ is u . The distance covered by the particle in t second will be:
- (a) $ut + \alpha t^2$ (b) $ut + \alpha t^3$ (c) $ut + \frac{1}{6}\alpha t^3$ (d) $ut + \frac{1}{2}\alpha t^3$
15. The Figure represents velocity – time graph of a moving body. The displacement in the interval 0 – x_3 will be:
- (a) $Y(x_1 + x_2 + x_3)$
 (b) $Y(x_2 - x_1)$
 (c) $Y(x_3 - x_2 - x_1)$
 (d) $\frac{Y}{2}(x_3 + x_2 - x_1)$
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16. A particle moves with uniform acceleration. It covers a distance of 130m in 5th second and 210m in 9th second. How much distance will it cover in 20sec?
- (a) 4.8km (b) 12.5km (c) 7.6km (d) 2.78km
17. A body is thrown upwards with velocity u . If the distance travelled by the body in 5th and 6th seconds of motion are same then the value of u will be ($g = 9.8\text{ms}^{-2}$)
- (a) 24.5ms^{-1} (b) 49ms^{-1} (c) 73.5ms^{-1} (d) 980ms^{-1}

18. A train initially at rest acquires a velocity of 108km/h in 5sec. After this it moves with constant velocity and comes to rest after covering 45m with uniform retardation. If the total distance travelled is 395m, then the total time taken by the train is
- (a) 12.2s (c) 6s
(b) 16.3s (d) 17.2s
19. A balloon moves with velocity 12m/s in the upward direction. When it is at 65m from the earth a stone is dropped from it, the time taken by stone reach the ground will be: ($g = 10\text{ms}^{-2}$)
- (a) 5s (c) 10s
(b) 5.5s (d) 12s
20. A stone is dropped from a tower. The distance covered by the stone in last second of fall is equal to distance covered by it in the first three second. The time taken by the stone to reach the ground will be:
- (a) 12s (c) 5s
(b) 7s (d) 6s
21. From the top of a tower of height H, a ball is dropped and it reaches ground in t s. At time $\frac{t}{2}$, the ball from ground will be at a height:
- (a) $\frac{H}{6}$ (c) $\frac{H}{4}$
(b) $\frac{H}{3}$ (d) $\frac{3H}{4}$
22. The velocity of a bullet reduces to half its initial value when it penetrates a wooden block through 6cm. Determine how much distance the bullet will cover further before coming to rest?
- (a) 2cm (c) 7.5cm
(b) 4cm (d) 5.2cm
23. A body starts from rest and covers a distance d with constant acceleration 'a'. Then the body covers distance 2d with constant speed. Finally, the body covers a distance 3d with constant retardation and comes to rest. The maximum velocity attained by the body during the entire motion will be:
- (a) $\frac{1}{\sqrt{2a}}$ (c) $\sqrt{\frac{2a}{d}}$
(b) $\sqrt{2ad}$ (d) $\sqrt{\frac{d}{2a}}$
24. A ball is dropped from the top of a tall building towards the ground. Just after one second another ball is dropped from the same height. The distance between the balls after two seconds after the release of the second ball will be:
- (a) 19.6m (c) 4.9m
(b) 24.5m (d) 9.8m
25. A particle moving with initial velocity 10ms^{-1} along a straight line has retardation 2ms^{-2} . The distance travelled by the particle in the 5th second will be:
- (a) 1m
(b) 50m
(c) 29m
(d) 75m