

St. Lawrence High School

A Jesuit Christian Minority Institution



Term: 1st Work Sheet – 3 Subject – Physics

Class – XI Subject – Physics

Date - 17.06.20

Chapter - Motion in 1D

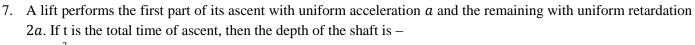
Topic – Uniformly accelerated motion

Choose the correct option for the following questions.

 $1 \times 15 = 15$

- 1. A car starts from rest and accelerates at a constant rate along a straight line. In the first second the car covers a distance of 2m. The velocity of the car at the end of 1 sec will be
 - a. 4 m/s
 - b. 8 m/s
 - c. 16 m/s
 - d. None
- 2. A ball is thrown upwards from the top of a tower 40m high with a velocity 10m/s. The ball goes up and then returning, touches the ground. What will be the total distance travelled by the ball before it touches the ground? (take $g = 10 \text{ m/s}^2$)
 - a. 5m
 - b. 45 m
 - c. 90 m
 - d. 50 m
- 3. In the above problem, what is the time taken by the ball to strike the ground is (take $g = 10 \text{ m/s}^2$)
 - a. 1 sec
 - b. 2sec
 - c. 3sec
 - d. 4sec
- 4. Water drops fall at regular intervals from a tap 5m above the ground. When the 3^{rd} drop is leaving the tap, the 1^{st} drop touches the ground. How far above the ground is the 2^{nd} drop situated at that instant? $(g = 10m/s^2)$
 - a. 1.25 m
 - b. 2.5 m
 - c. 3.75 m
 - d. 4.00 m
- 5. A stone is dropped from the top of a tower and one second later, a second stone is thrown vertically downward with a velocity 20m/s. The 2^{nd} stone will overtake the 1^{st} stone after travelling a distance of ($g = 10\text{m/s}^2$)
 - a. 13m
 - b. 15m
 - c. 11.25 m
 - d. 19.5 m

6.	When a ball is thrown vertically up with velocity v_0 , it reaches a maximum height of h. if one wishes to triple the maximum height then the ball should be thrown with velocity –
	a. $\sqrt{3v_0}$ b. $3v_0$ c. $9v_0$ d. $\frac{3}{2}v_0$
7.	A lift performs the first part of its ascent with uniform acceleration a and the remaining with uniform retardation



- 8. Two objects are moving along same straight line. They cross a point A with an acceleration a and 2a with velocity 2u and u respectively at time t = 0. The distance moved by the object when one
 - $6u^2$ b.

overtake other is -

- 9. Two trains are moving with velocities $v_1 = 10m/s$ and $v_2 = 20m/s$ on the same track in opposite directions. After the application of breaks if their retardations are $2m/s^2$ and $1m/s^2$ respectively, then the minimum distance of separation between the trains to avoid collision is –
 - a. 150 m
 - b. 225 m
 - c. 450 m
 - d. 300 m
- 10. The velocity of a particle is given as a function of time as v = (-2t + 40)m/s. What will be the displacement of the particle in first 10 sec?
 - a. 400 m.
 - b. 350 m
 - c. 300 m
 - d. 250 m
- 11. The velocity-time graph of a particle in 1D motion is a straight line passing through origin and making an angle 60^{0} with the positive x – axis. What will be the displacement of the particle in first sec if it stars from origin?
 - a. $64\sqrt{3} \ m$
 - b. $50\sqrt{3} \ m$
 - c. $45\sqrt{3} \ m$
 - d. $32\sqrt{3} \ m$

- 12. In the above problem, what will be the distance travelled by the particle when its velocity is just $20\sqrt{3}$ m/s?
 - a. $200\sqrt{3} \text{ m}$
 - b. $150\sqrt{3}$ m
 - c. $100\sqrt{3} \text{ m}$
 - d. $60\sqrt{3}$ m
- 13. An ant is at a corner of a cubical room of side a. The ant can move with a constant speed u. The minimum time taken to reach the farthest corner of the cube is
 - a. $\frac{3a}{u}$
 - b. $\frac{\sqrt{3}a}{u}$
 - c. $\frac{\sqrt{5}a}{u}$
 - d. $\frac{\left(\sqrt{2}+1\right)a}{u}$
- 14. A rocket is launched at earth's surface from rest with a constant acceleration of $10m/s^2$. If the fuel is finished 1.5min after it is launched, then the height it reaches when comes to rest is (take $g = 10m/s^2$)
 - a. 20.25 km
 - b. 10.125 km
 - c. 25.25 km
 - d. 30.375 km
- 15. A ball is released from the top of a tower of height h metre. It takes T seconds to reach the ground. What is the position of the ball in $\frac{T}{3}$ sec?
 - a. $\frac{h}{9}$ m from the ground
 - b. $\frac{7h}{9}$ m from the ground
 - c. $\frac{8h}{9}$ m from the ground
 - d. $\frac{17h}{18}$ m from the ground

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