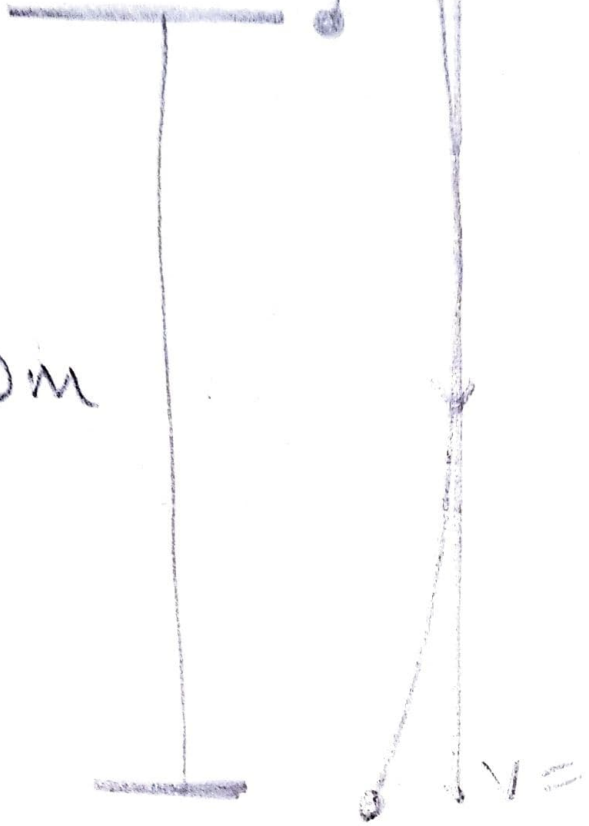
Sol°- 1.



(a) $v^2 - u^2 = 2as$

$\Rightarrow v = \sqrt{u^2 + 2as}$

$\Rightarrow v = \sqrt{100 + 2 \times 50 \times 10}$

$\Rightarrow v = \sqrt{100 + 1000} \Rightarrow v = \sqrt{1100} = 33 \text{ m/s}$

(b) $s = ut + \frac{1}{2}at^2$

$\Rightarrow -50 = 10t - \frac{1}{2} \times 10 t^2$

$\Rightarrow 5t^2 - 10t - 50 = 0 \Rightarrow 5(t^2 - 2t - 10) = 0$

$\Rightarrow t^2 - 2t - 10 = 0 \rightarrow a = 1, b = -2, c = -10$

$\Rightarrow t = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \times 1 \times (-10)}}{2 \times 1}$

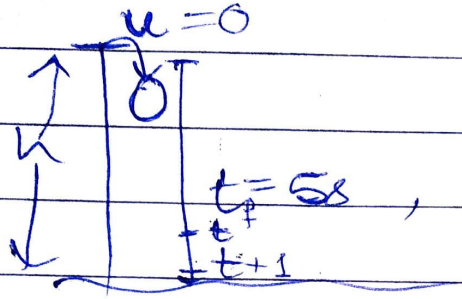
$\Rightarrow t = \frac{2 \pm \sqrt{4 + 40}}{2} = \frac{2 \pm \sqrt{44}}{2}$

$\Rightarrow t = \frac{2 \pm 2\sqrt{11}}{2} = \frac{2}{2}(1 \pm \sqrt{11})$

$\Rightarrow t = 1 + \sqrt{11} \text{ s}$ or $1 - \sqrt{11} \text{ s}$

second. ($g = 9.8\ m/s^2$)

Sol:




, $a = 9.8$

(a) $S = ut + \frac{1}{2}at^2 \Rightarrow h = \frac{1}{2} \times \frac{98}{10} \times 5 \times 5$

$= \frac{245}{2}\ m$

$= 122.5\ m$

∴ Height of bridge from water level = 122.5 m

(i) Distance travelled in $t+1$ s = in 5s is 122.5 m

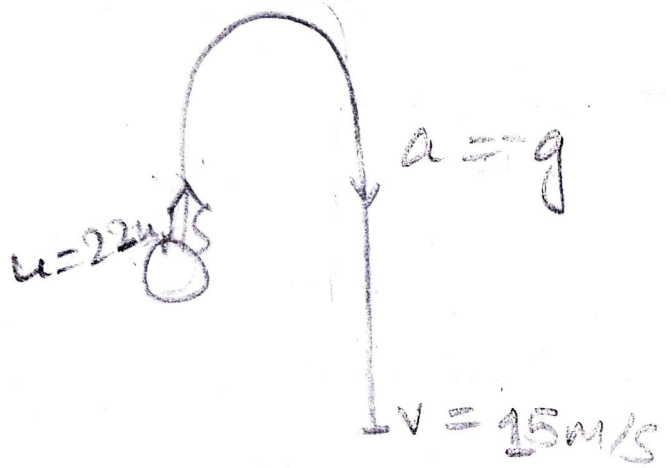
Distance travelled in t s i.e 4s

$= \frac{1}{2} \times \frac{98}{10} \times 4 \times 4 = 78.4\ m$

Distance travelled in last second = $122.5 - 78.4 = 44.1\ m$

3. A tennis ball is struck with a racket, firing it straight upward at 22 meters per second. After how much time will it be falling at 15 m/s?

Sol:- 3.




$v = -15\ m/s$ , $u = 22\ m/s$ , $a = -10\ m/s^2$

$v = u + at \Rightarrow -15 = 22 + (-10t)$

$\Rightarrow -15 - 22 = -10t \Rightarrow -10t = -37$

$\Rightarrow t = 3.7\ s$

∴ Time = 3.7 s