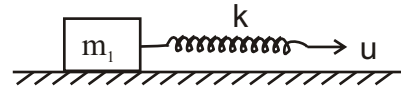
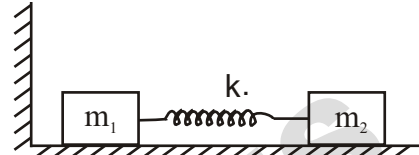


Assignment on Springs

- Q1. If a mass m_1 is connected with a spring constant K and the spring is pulled towards right with a constant velocity 'u'. Then find:
 (I) Maximum stretch of spring
 (II) Maximum velocity of the block



- Q2. If mass m_2 is shifted a small distance 'x' towards Left and then released. Find
 (I) Velocity of mass m_2 when m_1 leaves the contact with wall.
 (II) Maximum stretching in the spring
 (III) Velocity of centre of mass of the system.

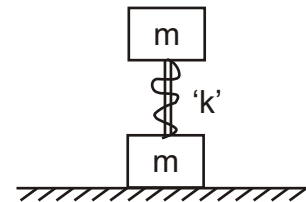


- Q3. If the natural unstretched length of spring ℓ_0 ; a Force 'F' is applied continuously on m_2 find maximum and minimum distance between the two masses.

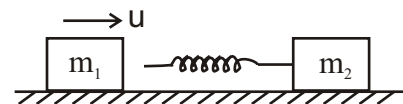


- Q4. Two masses m_1 and m_2 are attached by a spring in between of spring constant 'k' if the two masses are tied with the help of a string such that the two masses touched each other and then this system is given a constant velocity along (+ve) x-axis. At time ($t = 0$) when the system crosses origin the string is out. At any time 't' the displacement x_2 of particle is given by $x_2 = ut + A(1 - \cos \omega t)$ where A & ω are constants. Now find,
 (I) Position of particle of mass m_1 at any time 't': $x_1 = ?$
 (II) Also find the relation between A & ℓ_0 where ℓ_0 is the natural length of spring.

- Q5. In the following figure two masses are tied by a string after compressing string by a length 'a'.
 (I) Find the minimum value of 'a' for which the lower mass will just leave the contact with ground.
 (II) Also find the velocity of the blocks if the value of $a = 7 mg/k$, just after lower block will take off. Also find the height raised by centre of mass.



- Q6. If mass m_1 is coming towards a mass ' m_2 ' with a speed 'u'. Spring is of spring constant 'k'. Find the maximum compression in spring.



- Q7. If we compress the to $\frac{\ell_0}{2}$ and then left express the Final expressions.

