Spring mass system

Questions

1. How does the time period of oscillations change with increase in mass?
2. How does the time period of oscillations change with increase in spring constant?
3. Is the force exerted on the mass by the sprig zero at any instant during the oscillation?
4. Is the net force exerted on the mass zero at any instant during the oscillation?
5. What happens to the gravitational force on the mass during oscillation?
6. Is the acceleration in the direction of velocity at any instant during the oscillation?
7. Is acceleration always in a direction opposite to the displacement from the extreme position?

Note :

Questions given above may be visualized and solved using the simulations, obtaining a mathematical solution is to be always treated as the final answer. Such a mathematical solution implies that one is able to understand and apply the concept.