Answers - Quiz 1

1. Hooke's law states that the force **F** needed to extend or compress a spring by some amount **x** is proportional to that amount.
   F = kx, where **k** is a constant factor characteristic of the spring called stiffness. Hooke's law holds (to some extent) in many other situations where an elastic body is deformed.

2. **B**, higher the value of Young's modulus, stiffer is the material.

3. The result of a tensile loading test gives us a force-displacement plot. Since the amount of force required to stretch a material depends on the size of the material, to be able to directly compare the strength of different materials, the force and the displacement values are converted to stress and strain values by dividing by the initial cross-section and the initial length of the material, respectively, and then compared. We can identify materials by the amount of strain they can undergo, but we cannot identify materials by the amount of force or displacement they can withstand. This facilitates a convenient way to compare the strength of different materials, independent of their sizes.