## 3D Work Energy Principle 2.0

1. A light elastic string, of natural length 1.6 m and modulus of elasticity 10 N , has one end fixed at a point $A$ on a smooth horizontal table. A particle of mass 2 kg is attached to the other end of the string. The particle is held at point $A$ and projected horizontally across the table with speed $2 \mathrm{~ms}^{-1}$. Find how far it travels before first coming to instantaneous rest.
2. A particle of mass 0.5 kg is attached to one end of an elastic string, of natural length 2 m and modulus of elasticity 19.6 N . The other end of the elastic string is attached to the point O . If the particle is released from the point O , find the greatest distance it will reach below O .
3. A light elastic spring, of natural length 1 m and modulus of elasticity 20 N , has one end attached to a fixed point A. A particle of mass 2 kg is attached to the other end of the spring and is held at a point $B$ which is 0.8 m vertically below $A$. The particle is projected vertically downwards from $B$ with speed $2 \mathrm{~ms}^{-1}$. Find the distance it falls before first coming to rest.
4. A light elastic spring, of natural length 0.5 m and modulus of elasticity 10 N , has one end attached to a point A on a rough horizontal plane. The other end is attached to a particle $P$ of mass 0.8 kg . The coefficient of friction between the particle and the plane is 0.4 . The particle initially lies on the plane with $\mathrm{AP}=0.5 \mathrm{~m}$ and is then projected with speed $2 \mathrm{~ms}^{-1}$ away from A , along the plane. Find the distance travelled by P before it first comes to rest.
