

Dynamics

Questions A

- 1 Find the resultant force that will bring about an acceleration of 4 ms^{-2} for a particle of mass 3.75 kg
- 2 A particle of mass 4.5 kg is acted upon by forces $(6\mathbf{i} + 3\mathbf{j})\text{N}$ and $(-2\mathbf{i} + 7\mathbf{j})\text{N}$. Calculate the acceleration of the particle in vector form.
- 3 A toy train of mass 1.25 kg is pulled across a horizontal floor by a horizontal string. The tension in the string is 1.2 N . Calculate the acceleration and the distance traveled by the train in the first 4 seconds.
- 4 A car of mass 750 kg experiences a resistive force of $R \text{ N}$ while being brought to rest in 9 seconds from a speed of 18 ms^{-1} . Calculate the magnitude of the force.
- 5 A car of mass 900 kg is under constant resistance to motion of 500 N . Find the value of the engine force required to bring about an acceleration of 1.25 ms^{-2} .
- 6 A train of mass 4000 kg produces a driving force of 3000 N . If the train experiences constant resistance to motion of 1200 N calculate the acceleration.
- 7 A stone of mass 1.25 kg is dropped into a viscous liquid and fall vertically through it with an acceleration of 4.8 ms^{-2} . Find the resistive force acting against the stone.