**ELEVATOR PROBLEMS – APPARENT WEIGHT**

A 200 kg elevator accelerates from rest as it moves from the ground floor to the top floor. Midway it reaches constant velocity and then slows down as it approaches its destination. The velocity at the end of each second is indicated below:

1. Apparent Weight
2. FBD
3. Acceleration

v = 0 m/s

v = 0 m/s

v = 2 m/s

v = 4 m/s

v = 6 m/s

v = 8 m/s

v = 8 m/s

v = 8 m/s

v = 6 m/s

v = 4 m/s

v = 2 m/s

Accelerate Downwards

200 kg

Feels …

Feels …

Feels …

Accelerate Upwards

Constant Velocity

Fg =

Fg =

Fg =

200 kg

200 kg

The 200 kg elevator must come back to the ground floor. It accelerates from rest as it moves from the top floor to the ground floor. Midway it reaches constant velocity and then slows down as it approaches its destination. The velocity at the end of each second is indicated below:

1. Apparent Weight
2. FBD
3. Acceleration

v = 0 m/s

v = 0 m/s

v = 2 m/s

v = 4 m/s

v = 6 m/s

v = 8 m/s

v = 8 m/s

v = 8 m/s

v = 6 m/s

v = 4 m/s

v = 2 m/s

200 kg

Accelerate Downwards

Feels …

Feels …

Feels …

Fg =

Fg =

Fg =

200 kg

200 kg

Constant Velocity

Accelerate Upwards

**Weight vs. Apparent Weight**

Fg = Weight. Force of gravity on an object. Fg = mg. Weight will not change as long as we are near the surface of the Earth.

FN = Apparent weight. The weight we feel. The reading on the scale. Apparent weight can change if we accelerate up or down.