## Topic: Analyzing a freight elevator used to transport cars to their parking lots.

## Introduction:

A freight elevator is used to carry heavy-duty goods, which weigh above 2000 Kg. Therefore, I analyzed the freight elevator (vehicle elevators) of my society. This elevator is used to transport cars to and from the respective person's parking lot. Vehicular elevators are used majorly in buildings with limited space to move cars in to the parking garage. Hence, in order to create more parking space we have created storeyed buildings in which these elevators are used. My society's freight elevator has a capacity of 2.5 tons.



## Name: Samuel Pius

Therefore, by carrying out the first derivative test on the equation of displacement I derived the general equation for velocity.

For Acceleration (a):  $a \Rightarrow \frac{d(v)}{dt} = \frac{d(6E - 06x^5)}{dt} - \frac{d(3.5E - 04x^4)}{dt} + \frac{d(4.8E - 03x^3)}{dt} - \frac{d(0.0132x^2)}{dt} - \frac{d(0.0818x^1)}{dt} + \frac{d(1.4143)}{dt}$   $a = \frac{d(3E - 05x^4)}{dt} - \frac{d(1.4E - 03x^3)}{dt} + \frac{d(0.0144x^2)}{dt} - \frac{d(0.0264x)}{dt} - \frac{d(0.0818)}{dt}$   $a = 3E - 05x^4 - 1.4E - 03x^3 + 0.0144x^2 - 0.0264x - 0.0818$ Now we have the following expressions: Displacement(s):

 $s = 1E - 06x^{6} - 7E - 05x^{5} + 0.0012x^{4} - 0.0044x^{3} - 0.0409x^{2} + 1.4143x$ 

Velocity (v):

v=  $6E - 06x^5 - 3.5E - 04x^4 + 4.8E - 03x^3 - 0.0132x^2 - 0.0818x^1 + 1.4143$ Acceleration (a): a=  $3E - 05x^4 - 1.4E - 03x^3 + 0.0144x^2 - 0.0264x = 3223$ 

By using the online graphing cell unit, I got the following graphs for the velocity (v) and the acceleration (a) officiere valor: Velocity (v), velocity (y-axis) – time (x-axis) graph:

