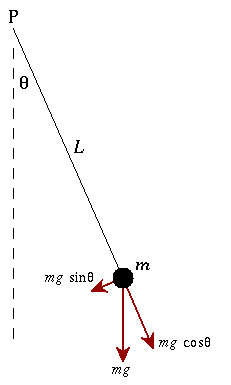
**Assignment 1**

**Aim:**

1. Assume .



1. To model the given physical system to a 2nd order ODE.
2. Solve the 2nd Order Differential Equation.
3. Plot for t: 0-200

**Code:**

1. Balancing forces on the free body diagram we get: and assuming the values of respectively and

, we get: . Also assuming tends to small value.

1. **Using Mupad:**

eq:= ode({q''(t) = -4.8\*q(t),q(0) = PI/6,q'(0) = 0},q(t))

x(t) :=solve(eq)

1. **Using Editor:**

Clc;

clear all;

close all;

syms t;

theta(t) = 0.5235987756\*cos(2.19089023\*t);

t = 0:0.01:2\*pi;

plot(t,theta(t));

title('Analysis of Physical System');

xlabel('time(s)'),ylabel('theta(t)');

**Output:**





****

**Conclusions:** 2nd order derivative equation were derived for given System, solved using mupad editor and graph was plot for the same.