SIMPLE HARMONIC MOTION

DYNAMICS.

SIMPLE HARMONIC MOTION

$a = -\omega^2 x$, x displacement from mean

defines SHM.

Newtons Second Law (NII) Nett $F = ma$

$\Rightarrow$ Nett $F = -m\omega^2 x$

$\Rightarrow$ Nett $F = -\xi x$, ξ number

SHM must be caused by forces which vary with position.:

- elastic strings
- Springs
- Buoyancy.

OR combinations of these with constant forces

ACCELERATED LINEAR MOTION.

$a =$ Constant

defines A.L.M.

Newtons Second Law (NII) Nett $f = ma$

$\Rightarrow$ Nett $F =$ m Constant.

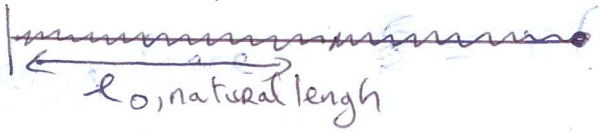
$\Rightarrow$ Nett $F =$ Constant.

ALM caused by forces which are constant :

- tensions in light inextensible strings
- gravity
- Normal Reactions

HOOKES' LAW:

Variable tension in a spring is proportional to its extension past its natural length.

Spring 

l_0, natural length

k spring constant (measure of elasticity)

l, extended length.

Spring force of spring with extended length l , $S = k(l - l_0)$

$S = k$ (Extension)

[For question on Hookes Law itself see APPENDIX ③]