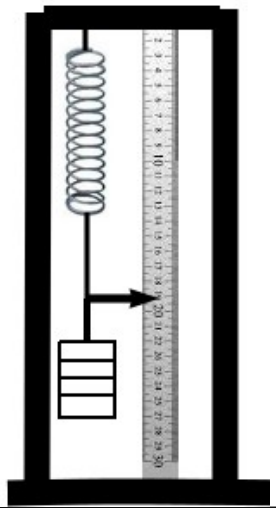
Helical Spring I

Aim:

1. To find the spring constant of the given Helical Spring using Load - Extension method also to determine the mass of the given body.
2. To draw the load extension graph of a helical spring and determine the spring constant from graph

Apparatus:

Helical spring Apparatus, weight hanger with slotted weight, unknown mass etc.



Principle:

(*For Aim 1)*

According to **Hooke's** Law, Load is proportional to the Extension.

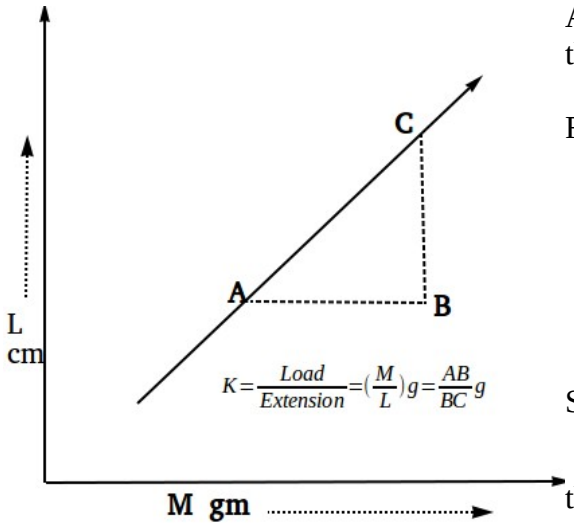
Spring Constant $K = \frac{Load}{Extension} = (\frac{M}{L})g$

where M is the mass suspended, g is the acceleration due to gravity at the place and L is the extension.

If ***l*** is the extension produced for the unknown mass m,

unknown mass = $(\frac{M}{L})l$

(*For Aim 2)*



According to **Hooke's** Law, Load is proportional to the Extension.

From the graph

Spring Constant $K = \frac{Load}{Extension} = (\frac{AB}{BC})g$

where g is the acceleration due to gravity at the place

Observations: **(*For Aim 1)***

Reading of the pointer with deadload r_0 = cm

Sl No	Mass Suspended in the Helical Spring gm	Reading of the Pointer on (cm)			Extension L= (r-r_0) cm	$(\frac{M}{L})$ g/cm
		Loading	Unloading	Mean		
1	m_0 +					
2	m_0 +					
3	m_0 +					
4	m_0 +					
5	m_0 +					
m_0 + unknown mass					l = cm	

Mean $(\frac{M}{L})$ = g/cm

= kg/m

Calculations:

Spring Constant K = $(\frac{M}{L})$ g = N/m

Unknown Mass = $(\frac{M}{L})l$ =

= g = kg

Observations: (*For Aim 2)*

Reading of the pointer with deadload r_0 = cm

Sl No	Mass Suspended in the Helical Spring (gm)	Reading of the Pointer on (cm)			Extension L= (r-r_0) cm
		Loading	Unloading	Mean	
1	m_0 +				
2	m_0 +				
3	m_0 +				
4	m_0 +				
5	m_0 +				

Calculations:

From graph $(\frac{M}{L})$ = $\frac{AB}{BC}$ = g/cm = g/cm

= kg/m

Spring constant from graph

K= $\frac{M}{L}g$ = N/m= N/m

Results:

1. Mass of the given body = kg
2. Spring Constant of the Helical Spring = N/m
3. Spring Constant of the Helical Spring (From graph) = N/m