Princess Sumaya جامعـــة
University الأميـــرة سميّـــة
for Technology للتكنولوجيا

PHYSICS LAB

(20147)

Experiment No. 7

Simple Harmonic Motion II
Combination of Two Springs

Name: …… Reg. No. ( )	
Partner Name: ……..…… Class ( )	
Date / / 20	**Mark ( )**

Simple Harmonic Motion. Combination of two springs

1. Objectives:

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_____

2. Apparatus:

_____

_____

3. Data:

a. Complete the following tables

1. Single spring 1

Original Length of the spring L_o = _____cm

No.	Mass M (gm)	Length of the spring L (cm)	Elongation of the spring $X = L-L_o$ (cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			

1. Single spring 2

Original Length of the spring L_o = _____cm

No.	Mass M (gm)	Length of the spring L (cm)	Elongation of the spring $X = L-L_o$ (cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			

b) Plot a graph of M against x on a graph paper for spring 1. From the graph, find the spring constant k1

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_____

_____

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c) Plot a graph of M against x on a graph paper for spring 2. From the graph, find the spring constant k2

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_____

_____

d) Complete the following table for the two springs in **series**:

No.	Mass M (gm)	Length of the spring L (cm)	Elongation of the spring $X = L-L_o$ (cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			

e) Complete the following table for the two springs in **parallel**:

No.	Mass M (gm)	Length of the spring L (cm)	Elongation of the spring $X = L-L_o$ (cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			

f) Plot a graph of F against x on a graph paper for two springs in series. From the graph, find the equivalent spring constant k_e.

_____

_____

g) Plot a graph of F against x on a graph paper for two springs in parallel. From the graph, find the equivalent spring constant k_e.

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_____

e) Calculate the theoretical values of k_e:

1. In case of series connection.

_____

_____

2. In case of parallel connection.

_____

_____

f) Calculate the percentage error in the value of k_e in each case.

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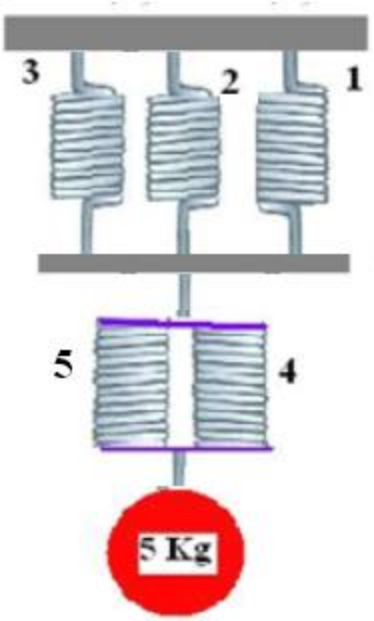
Questions:

1. A spring of force constant 10000 dyne/cm is cutting into 5 identical pieces and rearranged as shown in the figure below. A mass of 5 kg is hanged at the lower end and set to vibrate about its equilibrium position.



a) Find the equivalent force constant (k_{eq}) of the combination.

b) Find the period of vibration.

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