**MWAKICAN JOINT EXAMINATION (MJET)**

**FORM 3 TERM 1 YEAR 2016**

**232/3 PHYSICS PRACTICAL PAPER 3**

**TIME: 2 ¼ HOURS**

**NAME:………………………………………………………………..ADM NO:…………………**

**INSTRUCTIONS TO CANDIDATES**

* Write your name and index number in the spaces provided above.
* Answer all questions in the spaces provided in the question paper.
* You are supposed to spend the first 15minutes of the 2 ¼ hours allowed for the paper reading the whole paper carefully.
* Marks are awarded for clear record of the observations actually made, their suitability and accuracy.
* Candidates are advised to record their observations as soon as are made.
* Mathematical tables and calculators may be used.

|  |  |  |  |
| --- | --- | --- | --- |
|  | QUESTION 1 | QUESTION 2 | TOTAL |
| SCORES |  |  |  |
| OUT OF | 20 | 20 | 40 |

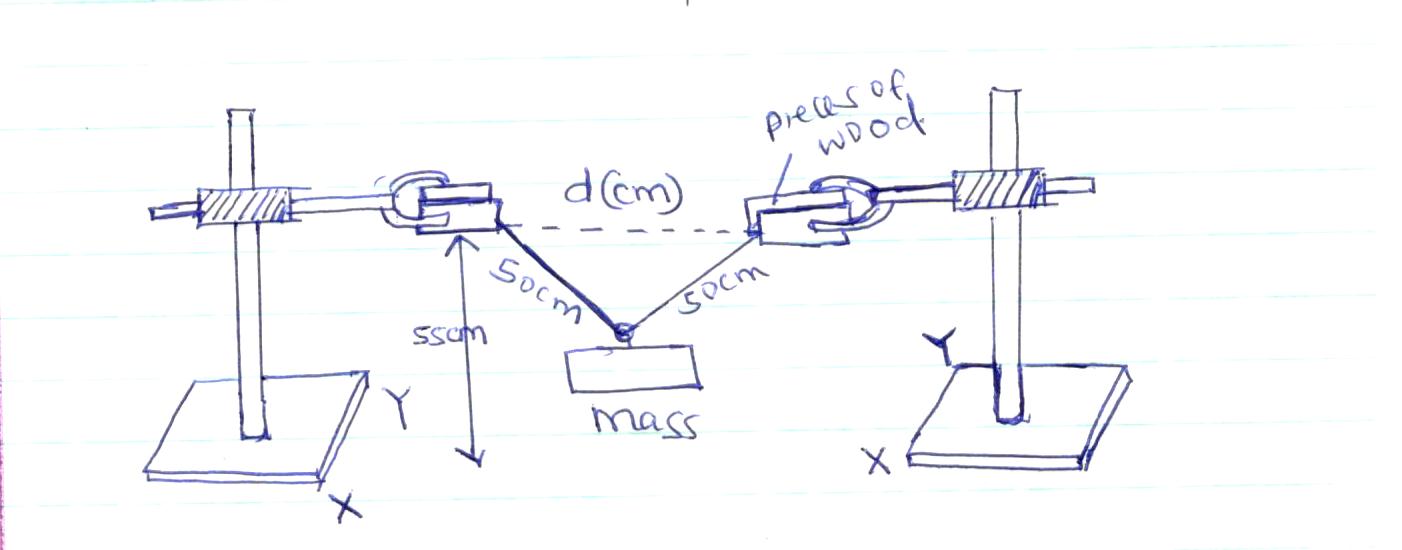
**QUESTION 1**

You are provided with the following apparatus

* A metre rule
* A cotton or a silk thread
* A stop watch or stop clock
* A 50g mass
* Four pieces of wood

Proceed as follows:

a)Measure accurately 1 metre of thread and cut it leaving an allowance of 50cm on either end. Mark the centre of the thread

b)Clamp the thread between two retort stands and suspend a 50g mass at the same level 55cm above the bench, as shown below. 

c)By moving one end of the retort stands, adjust **d** to value of 40cm.

d)pull the mass slightly in a direction parallel to **xy** then release it to oscillate. Record the time **t**,for 20 oscillations.

e)Repeat the procedure (c) and (d) with other values of **d**, increasing at intervals of 5cm and complete the table below. Where **T** is the periodic time.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| d(cm) | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 85 |
| t(s) |  |  |  |  |  |  |  |  |  |
| T(s) |  |  |  |  |  |  |  |  |  |
| T 2(s2) |  |  |  |  |  |  |  |  |  |
| d2(cm2) |  |  |  |  |  |  |  |  |  |

(7mrks)

f)plot a graph of T2  against d2 (5mrks)

g)Determine the slope of your graph.(3mrks)

T2 = 3d2 + C

m

h)Given that using your graph determine the values.

1. M (3mrks)
2. C (2mrks)

**QUESTION TWO**

**PART A**

You are provided with the following :

* Vernier calipers
* Micrometer screw gauge
* Masses;two 10g,20g,50g and 100g
* A helical spring
* Metre rule or half metre rule

**Proceed as follows**

a) Determine the number of complete turns of the helical spring.

N=……………………………………………….(1mrk)

b) Measure the external diameter of the spring using the vernier calipers

D=……………………………………m (1mrk)

c) Use the micrometer screw gauge to determine the diameter of the wire of the spring.

D=……………………………………m (1mrk

N= 0.4D

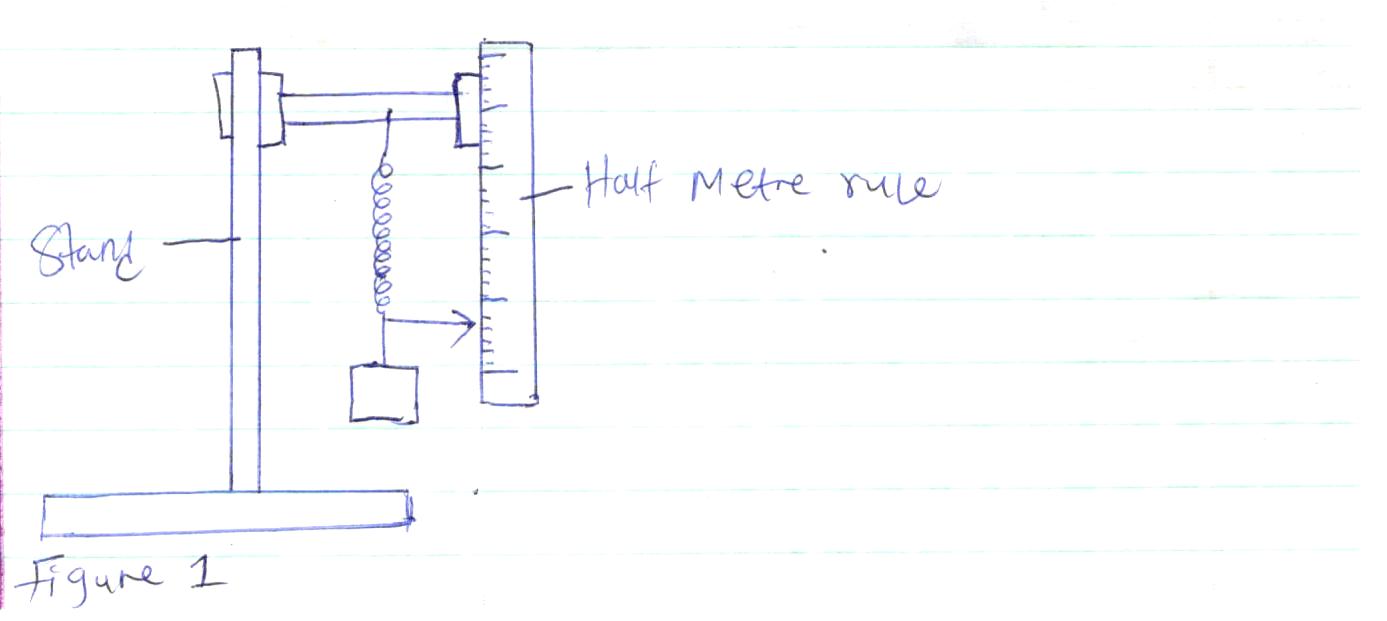
dM

d) Determine the value of M

(2mrk)

e)Suspend the helical spring vertically alongside the clamped half metre rule as shown in figure 1below.Determine the length Lo,of the spring before loading it.

Lo=………………………cm



f)load the spring with a mass of 20g and determine the new reading on the metre.(L) record this in the table below. Calculate the extension e=L-Lo due to the mass of 20g and record the value in the table given below. Repeat step f for other masses and complete the table.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mass(g) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| Weight(N) |  |  |  |  |  |  |  |  |  |  |  |
| Reading(L)cm |  |  |  |  |  |  |  |  |  |  |  |
| Extension e(cm) |  |  |  |  |  |  |  |  |  |  |  |
| Ye (cm-1) |  |  |  |  |  |  |  |  |  |  |  |

g)Plot a graph of weight (N) against 1/e (cm-1) (5mrks)

h)Determine the slope (s) of the graph at a mass of 45g (3mrks)

i)Given that

M= -255T

(S+60)2

Determine the value of T where S is the slope at 45g (3mrks)