NAME: ……INDEX NO: ……CLASS……

ADM. NO. …… SIGNATURE: …… DATE: ……

232/3
PHYSICS
PAPER 3
(PRACTICAL)
TIME: 2 ½ hours

BUSIA COUNTY JOINT EXAMINATION TEST 2014

Kenya Certificate of Secondary Education (KCSE)
PHYSICS
PAPER 3
TIME: 2 ½ HOURS

INSTRUCTIONS TO CANDIDATES

(a) Write your Name, Index Number and Admission number in the spaces provided above.
(b) Sign and write the date of Examination in the spaces provided above.
(c) Answer all questions in the spaces provided.
(d) You are supposed to spend the first 15 minutes of the 2½ hours allowed for this paper reading the whole paper carefully before commencing your work.
(e) Marks will be given for clear records of observations actually made, their suitability, accuracy and the use made of them.
(f) Candidates are advised to record their observations as soon as they are made.
(g) All working must be clearly shown where necessary.
(h) Mathematical tables and silent electronic calculators may be used.
(i) This paper consists of 8 printed pages. Candidates are advised to check that all pages are printed as indicated and no questions are missing.

FOR EXAMINER'S USE ONLY

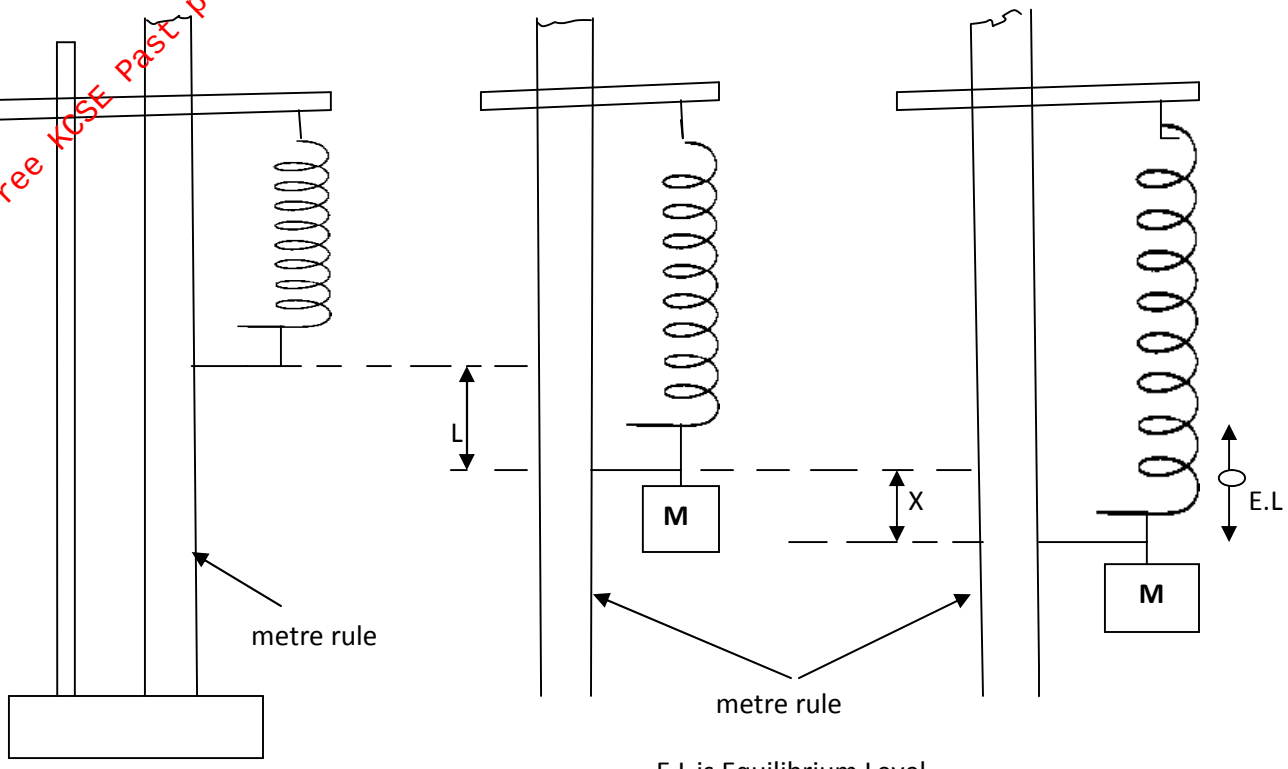
Question 1	A (i)	(ii)	(iii)	B	C(i)	(ii)	(iii)	D (i)	(ii)	TOTAL
Max. Score	½	½	1	6	5	2	1	2	2	20
Candidate's Score										
Question 2	(a)	(b)	(c)	d(i)	(ii)	e(i)	(ii)			TOTAL
Max. Score	1	8	5	2	1	1	2			20
Candidate's Score										

GRAND TOTAL

1. You are provided with the following apparatus

- A metre rule
- A mass marked M
- Six 20g masses
- A stop watch
- A complete stand
- A balance for sharing

Arrange the apparatus as shown in the figure 1.1(a) below



E.L is Equilibrium Level

1.1(a) **1.1(b)** **1.1(c)**

(A) Attach the mass marked M to the free end of the spring to exert a downward force Mg in newtons as shown in figure 1.1(b) above. if the mass causes an extension L called static extension, then Mg=kL where k is the spring constant and g is acceleration due to gravity.

(i) State the static extension L caused by M in cm

…… (½mk)

(ii) Using the balance, weigh the mass of M in grams ……g (½mk)

(iii) Determine the spring constant k in Newton per meter if g=10.0ms^{-2}

……

…… (1mk)

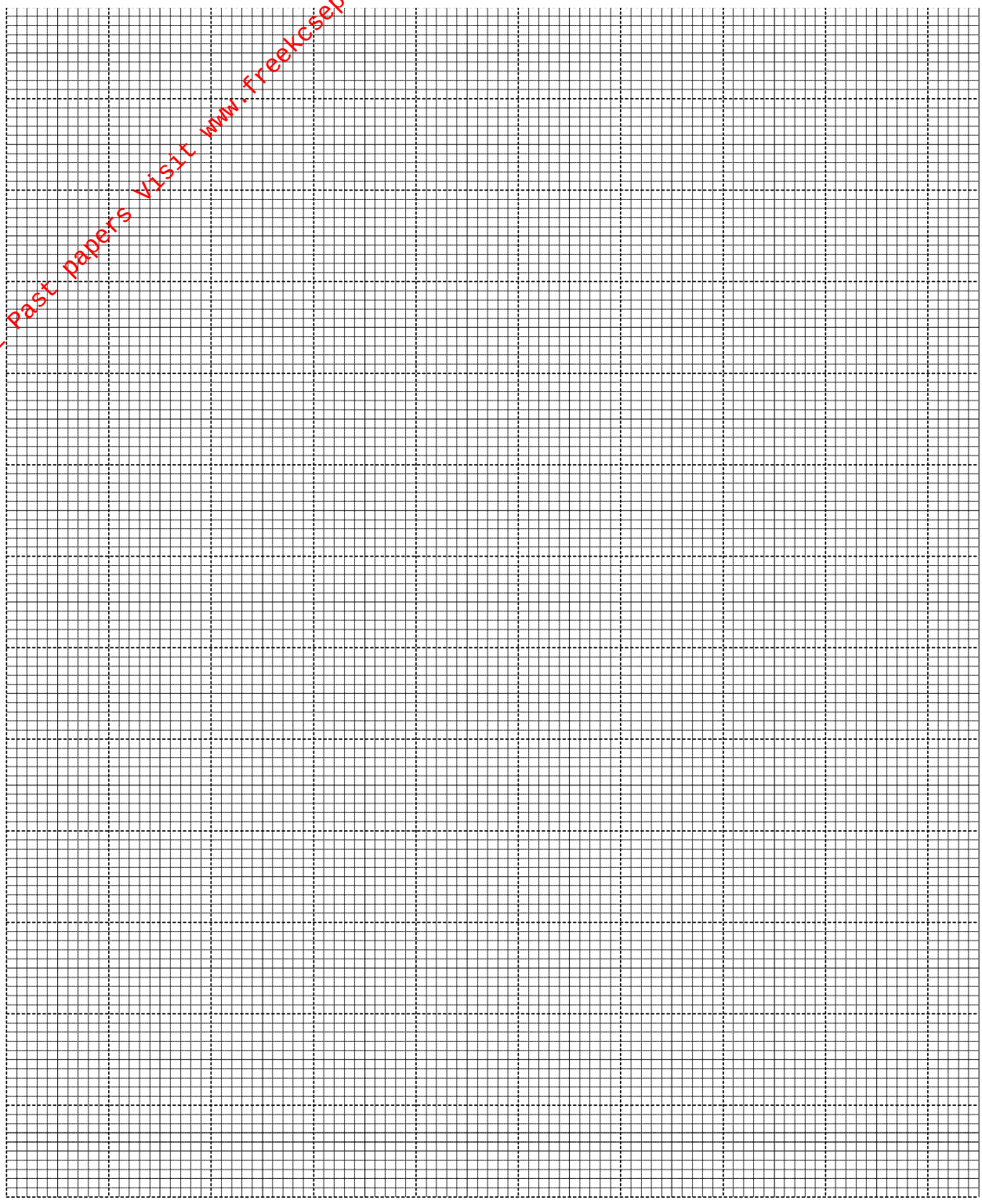
(B) Pull the mass M down a further distance x below the equilibrium position as shown in figure 1.1c. (x must be very small ≈5mm). Release the mass so as to oscillate up and down. Measure the time for 10 oscillations and record your values in the table shown below.

Repeat the experiment for the other values as shown and complete the table.

Mass m(g)	Extension L(cm)	Time for 10 oscillations (s)	Period T (s)	T^2 (S^2)
M				
M+20				
M+40				
M+60				
M+80				
M+100				
M+120				

(6marks)

(C) Plot the graph of L (in meters) against T^2 on the graph paper provided (5marks)



From your graph, determine:

(i) The slope of the graph

……

……

……

…… …… (2mks)

(ii) The intercept of the L – axis

…… (1mk)

(D) If Ms is the effective mass of the spring, the period T of the oscillating system is given by

$L = \frac{g.T^2}{4\pi^2} - g\frac{Ms}{K}$ Using this formula calculate:

(i) Acceleration due to gravity g

……

…….. (2mks)

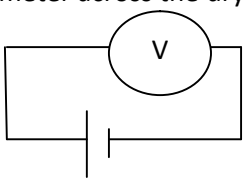
(ii) The effective mass Ms of the spring (2mks)

2. You are provided with the following apparatus

- A voltmeter
- An ammeter
- A 1.5V dry cell
- Six pieces of connecting wires
- A meter rule
- Mounted resistance wire

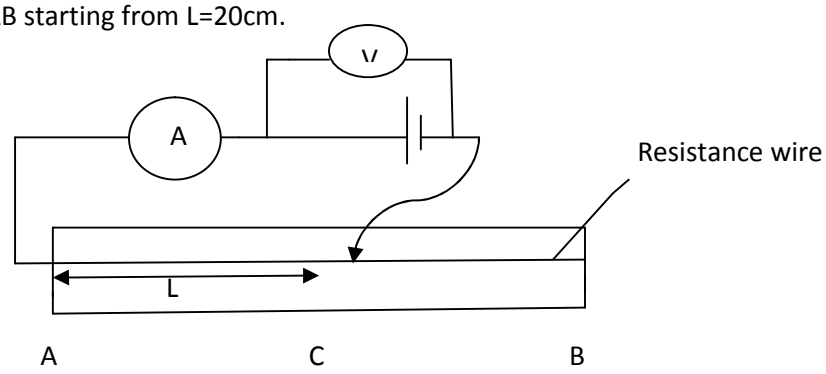
(a) Connect the voltmeter across the dry cell on an open circuit as shown in figure 2.1 below.

Figure 2.1



What is the reading of the voltmeter …… (1mk)

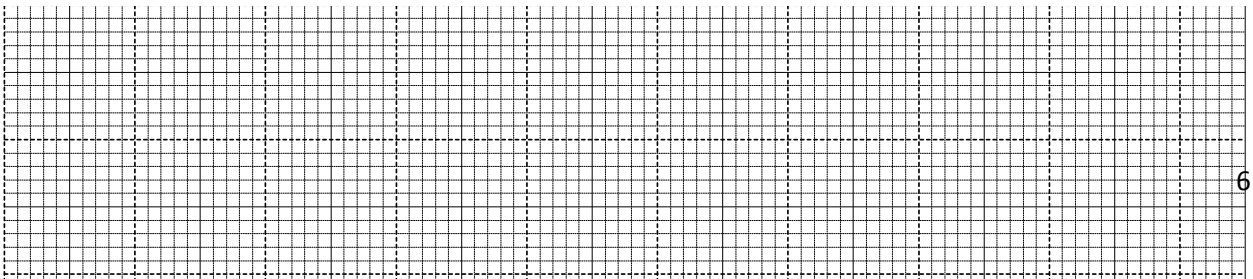
(b) Now connect the dry cell to an external circuit in the form of a resistance wire by placing the jockey on the wire AB starting from L=20cm.



Record the terminal p.d V in volts and the corresponding current **I** in amperes. Repeat the experiment for other values of L shown and complete the table. (8mks)

Length L (cm)	Terminal p.d V(volts)	Current **I**(A)	R=V/**I**	I/**I** (A^{-1})
20				
30				
40				
50				
60				
70				

(c) Plot a graph of R against 1/**I** (5mks)



(d) From your graph determine

(i) The slope (2mks)

(ii) The intercept of the R axis (1mk)

(e) Given that R=(E. 1/**1)** -r

Where E is the emf of the cell, **r** is the internal resistance of the cell, Determine from the graph:

(i) The emf E of the cell (1mks)

(ii) The internal resistance **r** of the cell (2mks)