Name:…… Adm. No. ……..

Index No. ……..

Class: ……..

Signature:……..

**232/3**
**PHYSICS**
**PRACTICAL**
**JUNE/JULY 2017**
**TIME: 2 ½ HRS**

# KASSU EDUCATIONAL IMPROVEMENT EXAMINATION
## Kenya Certificate to Secondary Education
## PHYSICS PAPER 3
## PRACTICAL



**Instructions**

- *Write your name, admission number, class and signature in the spaces provided at the top of the page.*
- *Answer **all** the questions in the spaces provided in this paper.*
- *You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the whole paper carefully before your start.*
- *Marks will be given for clear record of observations actually made, for their suitability and accuracy, and the use made of them.*
- *Candidates are advised to record their observations as soon as they are made.*
- *Electronic calculators and mathematical tables may be used.*

**FOR EXAMINER'S USE ONLY**

| Question(s) | Maximum Score | Candidate's Score |
|---|---|---|
| 1 | A 15 | |
| | B 5 | |
| 2 | A 16 | |
| | B 4 | |
| TOTAL | 40 | |

This paper consists of **9** printed pages. Candidates are advised to check and to make sure all pages are printed.

**QUESTION 1**

**PART A**

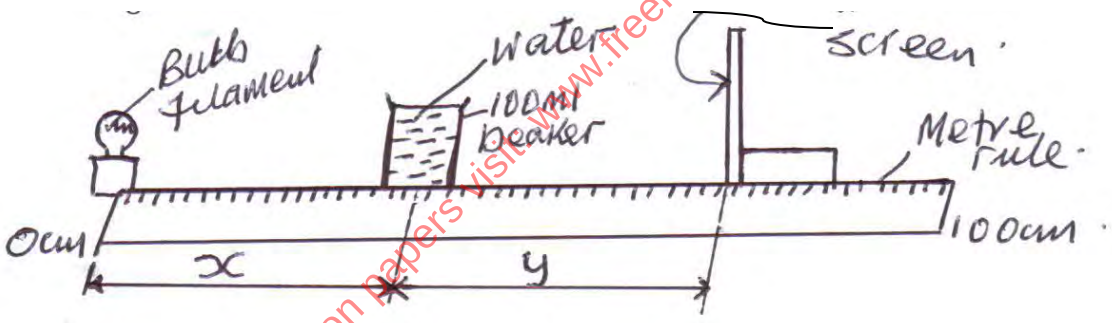
You are provided with the following;

- A lighting bulb (In a complete circuit with switch)
- 100ml beaker filled with water
- White screen.
- Metre rule
- A piece of plasticine

Proceed as follows:

(a) (i) Firmly fix the metre rule on the bench using plasticine provided.

Position a lighting bulb at a distance of 7cm from the centre of the beaker. The bulb filament should be at a horizontal position as the middle of the vertical height of the beaker.



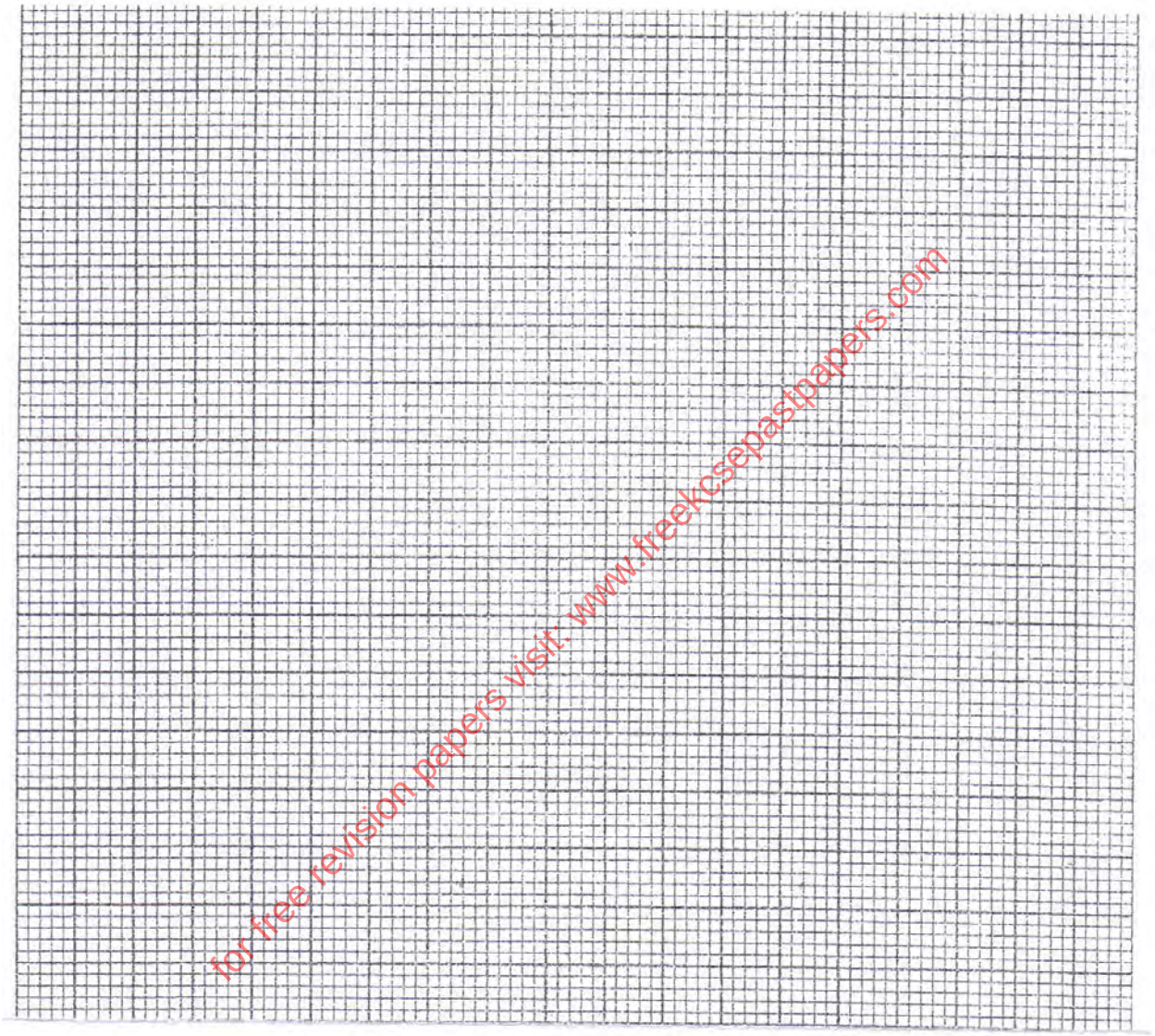

(ii) Switch on the bulb and adjust the position of the screen until a sharp vertical line of light is observed on the screen. Measure and record the distance y cm. Tabulate your results. **(5 marks)**

Table

| Distance x (cm) | Distance y (cm) | $y/x$ |
|---|---|---|
| 7 | | |
| 10 | | |
| 15 | | |
| 20 | | |
| 25 | | |
| 30 | | |

(b) (i) Repeat the experiment for values of x = 10, 15, 20, 25, 30cm.
Determine the values of $^{y}/_{x}$.

(c) Plot a graph of $^{y}/_{x}$ against y cm. **(5 marks)**




(d) (i) Determine the slopes S of the graph. **(3 marks)**

S =

(e) Given that $\frac{y}{x} = sy - 1$

Determine the value of y when $\frac{y}{x} = 1$. **(2 marks)**

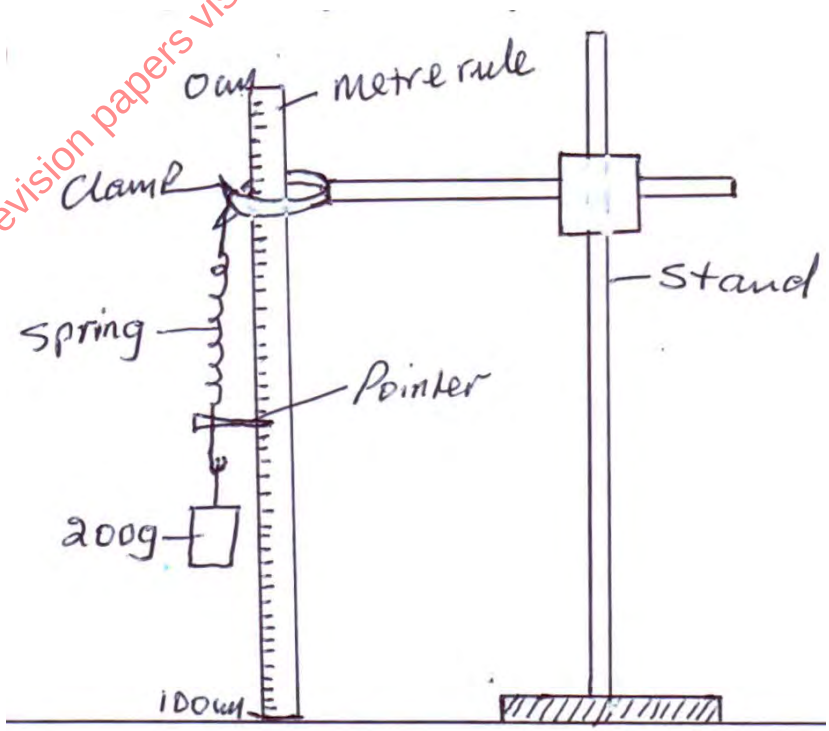
**PART B**

You are provided with the following;

- A helical spring with pointer
- A 200g or 2 $\times$ 100$g$ mass
- A stop watch
- A metre rule
- 1 stand + clamp + Boss

Proceed as follows.

(a) (i) Clamp the metre rule vertically with the 0 cm mark at the top. Hang the spring on the clamp such that the pointer slides on the metre rule.



(ii) Record the position of the pointer for the unloaded spring. **( ½ mark)**

Unloaded spring position lo = …….. cm mark.

(b) Load the spring with 200g mass and determine its extension e …… **(1 mark)**

e = …….. m

(c) Displace the mass on the spring by pulling it slightly downwards and release it to oscillate freely. Record the time for 10 complete oscillations.

Time for 10 oscillations = …….. seconds **( ½ mark)**

Find the periodic time T. **(1 mark)**

T = ……..s

(d) From the formula.

$g = \frac{4\pi^2 e}{T^2}$. Determine the value of g. **(2 marks)**

g = ……

**QUESTION 2**

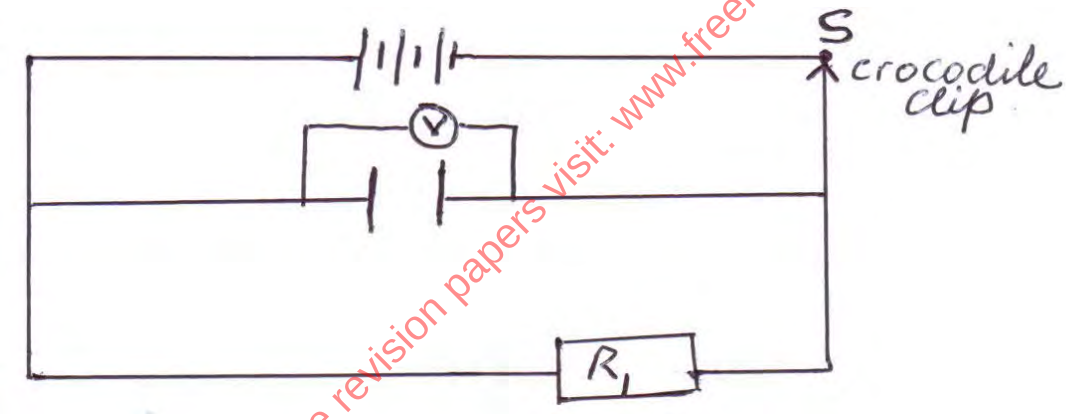
**PART A**

You are provided with the following;

- A voltmeter 0 – 5V
- A capacitor C
- A switch
- A stop watch
- 9 connecting wires
- 3 cells and 3 cell holder to hold 1 – 3 cells
- A resistor $R_1$
- Ammeter (O – 1)A
- A resistor $R_2$

Proceed as follows:

(a) Set up the circuit as shown in the figure.






(i) Charge the capacitor C by connecting the crocodile clip to S. Record the reading of the voltmeter, $V_0$. **(1 mark)**

$V_0$ = ……..

(ii) Calculate the value of the current $I_0$ given that $I_0 = \frac{V_0}{R1}$ (where $R_1 = 4.7 \times 10^3 \Omega$)

**(3 marks)**

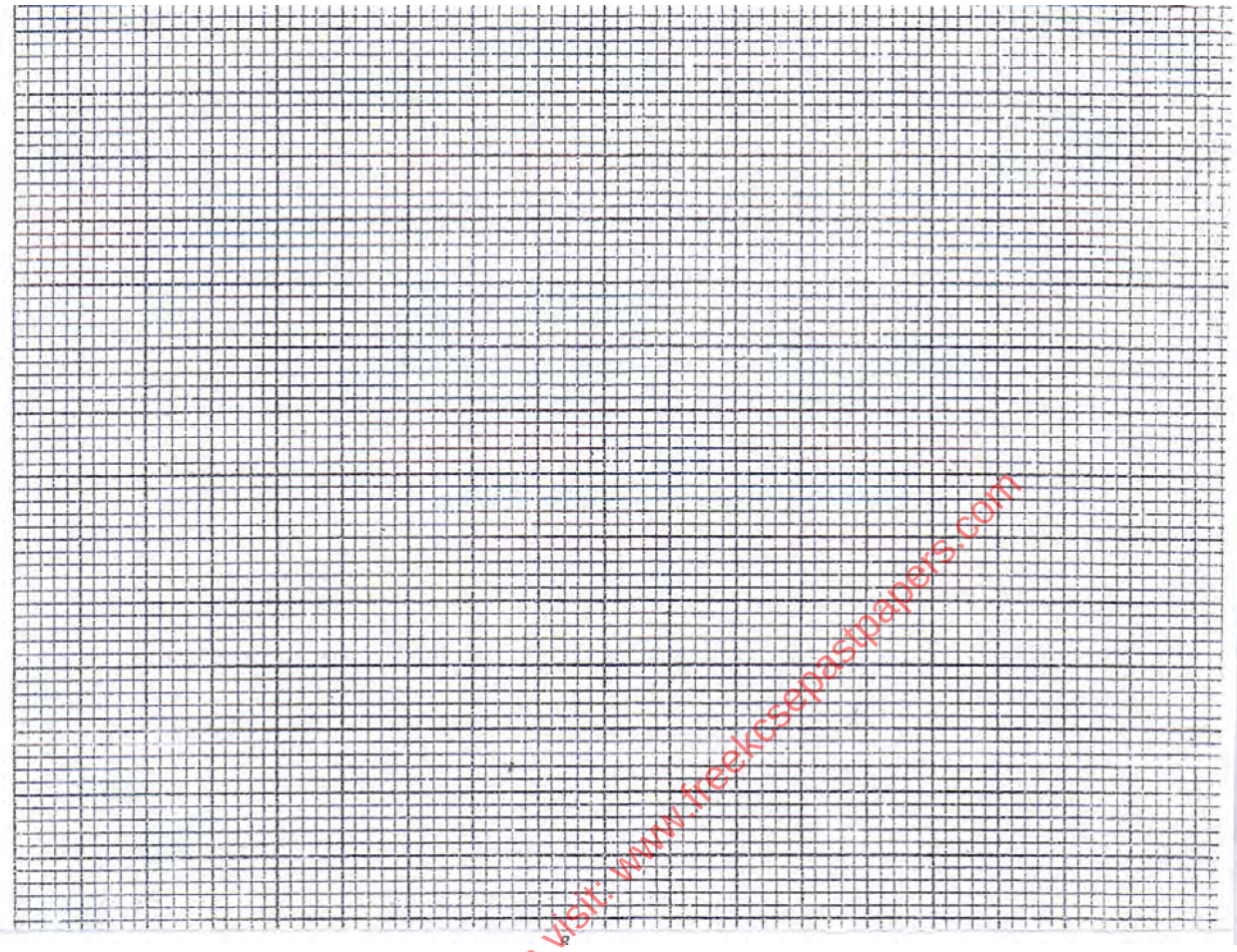
(iii) While the voltmeter shows maximum voltage $V_0$ open the crocodile clip from S and start the stop watch simultaneously. Stop the stop watch when the voltage has dropped from $V_0$ to 4.0V. Read the record in the table the time taken. **(4 marks)**

Voltage V = $V_0$ when t = $0_{(s)}$

| Voltage V | | 4.0 | 3.5 | 3.0 | 2.5 | 2.0 | 1.5 | 1.0 | 0.5 |
|---|---|---|---|---|---|---|---|---|---|
| Time, t (s) | 0 | | | | | | | | |

(iv) Reset the stop watch and close the switch. Repeat the procedure in (i) - (iii) to measure and record the time taken for the voltage to drop from $V_0$ to each of the other values on the table.

(b) On the grid provided, plot a graph of voltage V (y-axis) against time (s).





(ii) Use the graph to determine the time t at which $V = \frac{V_0}{2}$

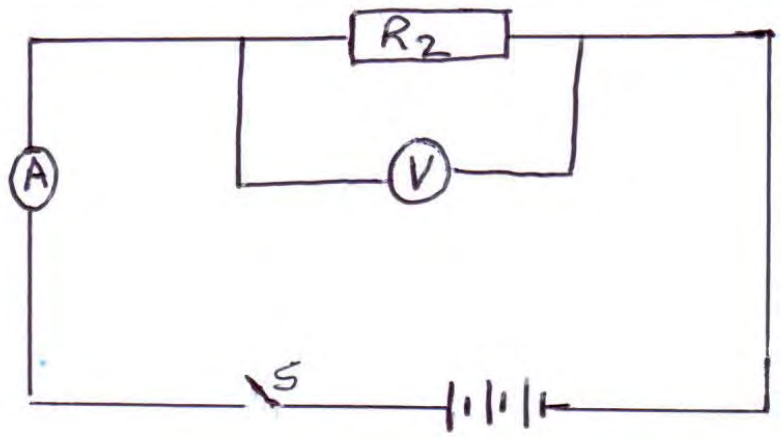
t = ..... Seconds **(1 mark)**

(c) Determine the resistance of the voltmeter $R_v$ given that;

t = 0.693 $CR_v$ where C is the capacitance of the capacitor. **(3 marks)**

**PART B**

(a) Connect the circuit as shown below.




Close the switch and record the ammeter and voltmeter reading. **(1 mark)**

P.d V(v) = v

Current I(A) = A

Hence determine the value of resistance $R_2$. **(2 marks)**