THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

031/2B

PHYSICS 2B
ACTUAL PRACTICAL B
(For Both School and Private Candidates)

Time: 2:30 Hours **Tuesday, 19th November 2013 a.m.**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** questions.
2. Each question carries 25 marks.
3. Where calculations are involved show your work clearly.
4. Marks for questions are indicated at the end of each question.
5. Calculators and cellular phones are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).
7. Use $\pi = 3.14$.

1. **You are provided with a Pendulum bob, Stop watch/clock, Thread, Tape measure, Retort stand and clamp. Proceed as follows:**
Set the apparatus as shown in Figure 1.

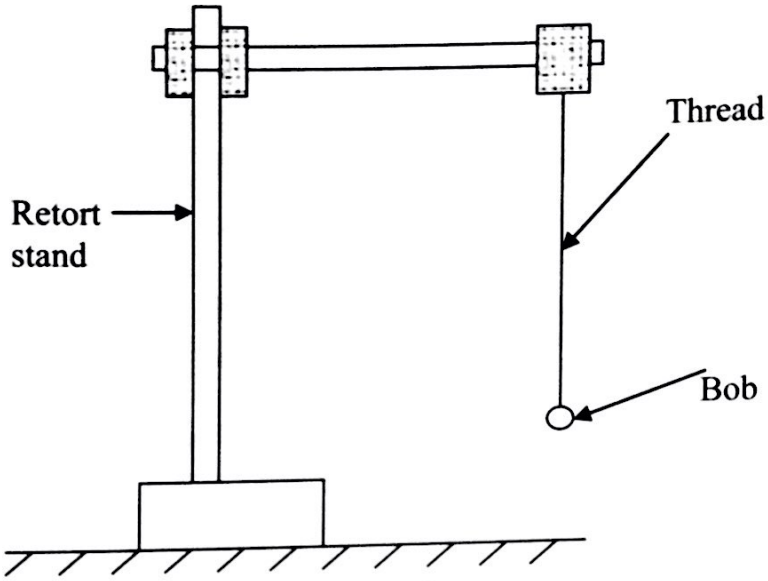

Figure 1

(a) Adjust the thread to length (L) of the pendulum to 140cm. Set the bob into oscillations by displacing it to a small angle and releasing it. Record the time (t) taken for 10 complete oscillations.

(b) Repeat (a) above for the length of the pendulum L = 120cm, 100cm, 80cm, 60cm, and 40cm. Record your results in a suitable table including periodic time T and T^2.

(c) Plot a graph of T^2 against L.

(d) Determine the slope of your graph.

(e) From the graph, state the relation between T and L.

(f) Using graph, find the time taken by the bob to oscillate when the length of the pendulum L = 50cm.

(g) Given that $\frac{1}{L} = \left(\frac{2\pi}{g^{\frac{1}{2}}T}\right)^2$, calculate the acceleration due to gravity g.

(h) Suggest the aim of this experiment.

(i) State any two (2) sources of error.

(25 marks)

You are provided with a Source of power 3V, Rheostat, Ammeter, Resistor, Voltmeter, Key and connecting wires. Proceed as follows:
Set the apparatus as shown in Figure 2.

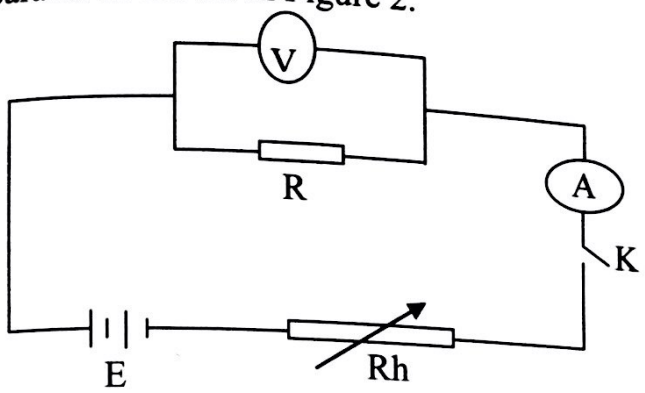

Figure 2

(a) Name the special symbols used in the circuit in Figure 2.

(b) (i) Close the switch and adjust the Rh by sliding slowly from one end.
(ii) Read and record the values of V and I.
(iii) Repeat the experiment by changing the position of slider on Rh for four (4) different positions and tabulate your results.

(c) (i) Plot a graph of V against I.
(ii) What is the shape of your graph?
(iii) Determine the slope of your graph.
(iv) What is the physical meaning of the slope obtained in 2 (c) (iii)?
(v) From the graph, determine the value of p.d. when the current is 0.25A.
(vi) What is the relationship between V and I across R?
(vii) Why is this experiment not an accurate method of calculating resistance?
(viii) State the law governing this experiment.

(d) What is the aim of this experiment?

(e) State one source of error and how to minimize it.

(25 marks)