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, 18th November 2014 a.m.**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** questions.
2. Where calculations are involved show your work clearly.
3. Marks for questions are indicated at the end of each question.
4. Calculators and cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).
6. Use acceleration due to gravity, $g = 10ms^{-2}$.
7. Use $\pi = 3.14$.

1. You are provided with a metre rule, retort stand and clamp, pendulum bob, stop watch thread. Proceed as follows:

(a) With a help of thread, tie a pendulum bob to the retort stand and then allow it to t the floor by adjusting the thread.

(b) Adjust the thread so that the bob is at a distance (d) of 10cm from the floor.

(c) Allow the bob to oscillate for a small angle and record the time for 20 comp oscillations.

(d) Repeat procedure (b) and (c) for d = 20cm, 30cm, 40cm and 50cm.

(e) Record your data for d, t, T and T^2 in a tabular form.

(f) Plot a graph of T^2 against d.

(g) State the nature of the graph.

(h) Determine the slope of your experiment.

(i) Given that $T = 2\pi\sqrt{\frac{d}{g}}$, calculate the acceleration due to gravity g.

(j) States two possible sources of error in this experiment.

(k) Suggest the aim of the experiment.

(25 mark

2. You are provided with a white sheet of paper, drawing board, plane mirror, transparent rul optical pins and drawing pins. Proceed as follows:

(a) Fix a white sheet of paper on the drawing board using drawing pins. Draw a straig line M_1M_2 on the paper and place the reflecting surface of the mirror along it.

(b) Insert optical pin O as object to make ON = U = 2.5cm and place other optical pins I and P_2 so that they can appear in line with the image of O seen in the mirror as show in Figure 1. Remove P_1 and P_2 and mark their positions with a pencil. Using the sam two pins, repeat the procedure for positions of P_3 and P_4.

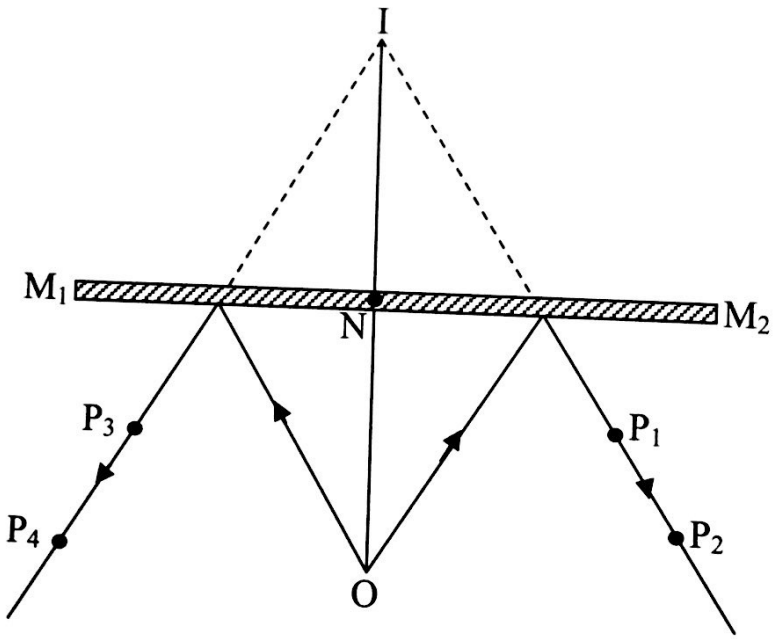

Figure 1

(c) Remove the mirror, join P_2 and P_1, P_4 and P_3 and produce the lines to meet at I, th position of virtual image of O. Join NI = V.

(d) Measure and record ON and NI. Repeat the procedure for U = 5cm, 7.5cm, 10cm and 12.5cm.
(e) State the nature of image formed.
(f) Tabulate your results.
(g) Plot a graph of U against V.
(h) From the graph, determine the value of V when U is 6cm.
(i) Calculate the slope, M, of your graph to the nearest whole number.
(j) What does the reciprocal of the slope represents?
(k) State the relationship between U and V.
(l) Write equation connecting U and V using numerical value of M with symbols U and V.
(m) State the laws governing this experiment.
(n) State a possible source of error in this experiment.
(o) How can you minimize the error in 2 (n)?
(p) Suggest the aim of this experiment.

(25 marks)