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

031/2

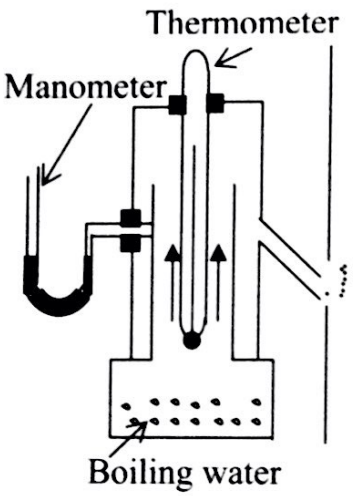
PHYSICS 2
ALTERNATIVE TO PRACTICAL
(For Both School and Private Candidates)

Time: 2:30 Hours ***Wednesday, 12th October 2011 a.m.***

Instructions

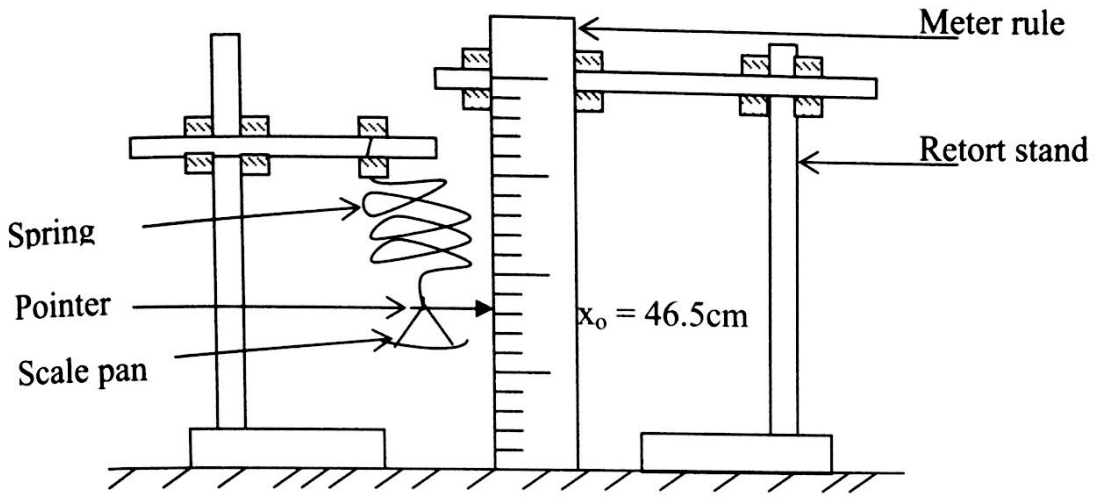
1. This paper consists of **five (5)** questions. Answer **all** the questions.
2. Marks for each question or part thereof are indicated beside the question.
3. Calculators and cellular phones are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).
5. Use $\pi = 3.14$.

1. Fill in the gaps with the correct response.

Name of Device	Sketch	Physical Effect	Applications
(a) Periscope			
(b)		Stationary wave in strings.	Show properties of string vibrations.
(c)			
(d) Sliding jockey			
(e) Dry cell			

(10 marks)

2. An experiment using the arrangement shown below was performed in a Laboratory.



The data were recorded in Table 1.

Table 1

Load m (g)	Length x (cm)	Extension S (cm)
0	46.5	
50	48.2	
100	50.1	
150	51.6	
200	53.3	
250	54.9	

(a) Complete Table 1 by computing the values of extension. **(3 marks)**
(b) Plot a graph of extension S against load m. **(3 marks)**
(c) Find the slope. **(1 mark)**
(d) What was the aim of the experiment? **(1 mark)**
(e) Explain two sources of error in this experiment. **(1 mark)**
(f) How can you minimize the errors in (e) above? **(1 mark)**

3. In an experiment performed by a student the following results were recorded in Table 2.

Table 2

Angle of incidence (i^o)	Angle of refraction (r^o)	Sin i	Sin r	$\frac{Sin\,i}{Sin\,r}$
30	19		0.33	1.52
40	25	0.64	0.42	
50	30			
60		0.87	0.62	1.40

(a) Complete Table 2 by filling the correct results. **(3 marks)**
(b) Plot a graph of sin i against sin r. **(3 marks)**
(c) Calculate the slope of the graph. **(1 mark)**
(d) What is the physical meaning of the slope obtained in (c) above? **(1 mark)**
(e) Identify and state the law verified by this experiment. **(2 marks)**

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4. In an experiment to determine the e.m.f. and internal resistance of a cell, the following results were recorded.

Current I (Amperes)	1.0	1.5	2.0	2.5	3.0
Potential difference V (volts)	1.8	1.7	1.6	1.5	1.4

(a) Plot a graph of V against I. **(3 marks)**
(b) What is the nature of the graph? **(1 mark)**
(c) Use your graph to determine the e.m.f of a cell. **(2 marks)**
(d) Find the slope of the graph. **(1 mark)**
(e) Write the equation governing this experiment. **(1 mark)**
(f) Calculate the value of the internal resistance of the cell. **(2 marks)**

5. Table 3 shows the pairs of frequency (f) and tension (T) of a constant length vibrating string of a sonometer obtained in a certain experiment.

Table 3

Frequency f (Hz)	Tension T (kgf)	$\sqrt{T}\ (Kgf)^{\frac{1}{2}}$
80	0.49	
170	2.25	
230	4.00	
350	9.61	
400	12.25	
570	25.00	

(a) Complete Table 3.
(b) Plot the graph of frequency (f) against $\sqrt{T}$ **(3 marks)**
(c) From the graph in (b) determine: **(3 marks)**
(i) the frequency (f) when $\sqrt{T}$ is 2.5 **(1 mark)**
(ii) the slope of the graph **(1 mark)**
(iii) the relation between f and $\sqrt{T}$ **(2 marks)**