232/3 2018

PHYSICS

PRACTICAL

JUNE /JULY

TIME: 2HRS 30 MINUTES

GATUNDU SOUTH FORM FOUR JOINT EVALUATION EXAMINATION 2018

MARKING SCHEME 2018

QUESITON TWO
This question has two parts A and B. answer both parts

PART A
You are provided with the following:
- A meter rule
- Two identical 100g masses
- About 200ml of liquid L in 250ml beaker
- Three pieces of thread, each about half metre long
- Stand with clamps
- Tissue paper

Proceed as follows:
(a)   Using a stand and one piece of thread, suspend the metre rule in air such that it
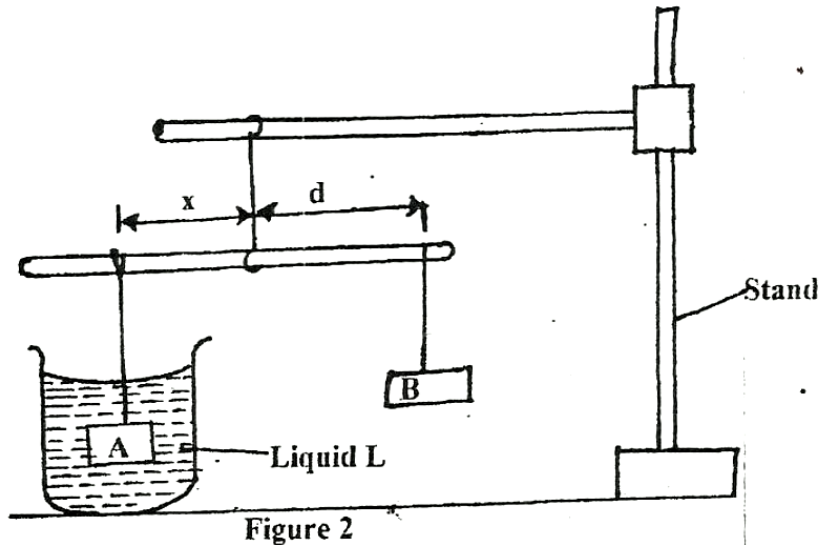   balances horizontally.

        Record the position of the centre of gravity. G.

        G = *500* mm   **(1mk)**

NOTE: The metre rule should remain suspended at this point through out the experiment.
(b) Set up the apparatus as in figure 2 below.

Figure 2

Suspend the sums A at a distance x = 50mm. adjust the position of mass B until it balances mass A immersed in liquid L.
Record the distance d, of mass B from the pivot.
Repeat the same process for other values of x in table 2 below and complete the table.

x (mm)	50	100	150	200	250	300	
X (cm)							
d (cm)	4.4	9.2	13.6	18.2	23.0	27.4	±0.2

(c) Plot a graph of d (y axis) against x (cm).

Axes - labeled with quantity and correct units   **1mk)**
Scale - simple and uniform   **(1mk)**
Plotting – each point ½mk to a max of four point   **(2mks)**
Line -Straight line   **(1mk)**

(d)   Determine the slope, S of the graph

         Gradient = $\dfrac{DY}{D5}$ = $\dfrac{14\text{-}0}{15\text{-}0}$
                  = 0.9333

Correct substation   both intervals ½mk each   **(1mk)**
Evaluation   (3sf a must)   **(1mk)**
Ignore unit

(e)   Given S = $\underline{F}$, where F is the apparent weight of objects A in the liquid L and W is

W   the actual weight of A, find: -

(i) The value of F.

$$0.9333 = \frac{F}{1}$$

$$F = 0.9333N$$

Correct substation   **(1mk)**
Evaluation   (3sf a must)   **(½mk)**
Unit a must N   **(½mk)**

(i) The up thrust, U

$$U = W - F$$

$$U = 1 - 0.9333$$
$$U = 0.0667N$$

Correct substation   **(1mk)**
Evaluation   (3sf a must)   **(1mk)**
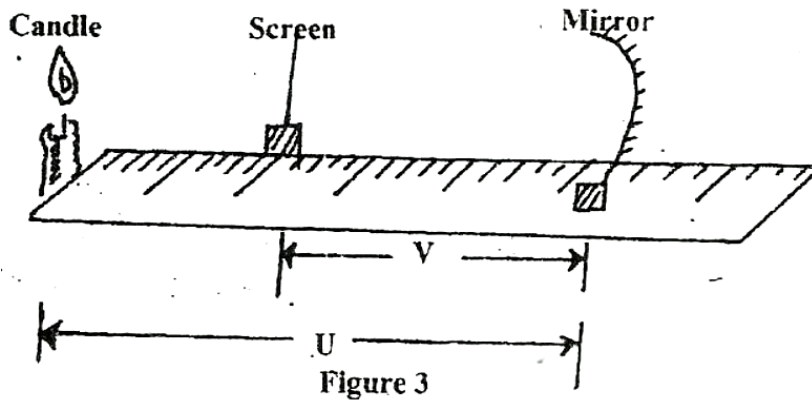**Unit a must N**   **(1mk)**

PART B
You are provided with the following:
- A concave mirror with holder
- A screen
- A meter rule
- A candle
- A match box (to be shared)

Proceed as follows:

(f) Set p the apparatus as in figure 3 below.

Figure 3

(g)   Put the object at a distance u = 30cm from the mirror. Adjust the position of the
        screen until a sharp image is formed on the screen. Record the distance V.

(h)   Repeat procedure (b) above for the distance u = 40cm and record the new distance
        V. complete the table 3 below.

U (cm)	V (cm)	M =v/u	(m+1)
30	22.5	1.333	2.333
40	30.1	1.329	2.329
	± 0.5 1dp **(1mk)**	Exert 3sf(**½mk**)	Exert 3sf (**½mk**)

(i)   Given $f = \dfrac{V}{(m + 1)}$, calculate the values of f hence determine the average value f_{av}:
                                                                                            (3 marks)

$f_1 = \dfrac{22.5}{2.333} = 9.657\text{cm}$

Correct substation   **(½mk)**
Evaluation with unit a must (3sf a must)   **(½mk)**
No unit denial   **(½mk)**
Wrong units award zero

$f_2 = \dfrac{30.1}{2.329} = 12.924\text{cm}$

Correct substation   **(½mk)**
Evaluation with unit a must (3sf a must)   **(½mk)**
No unit denial   **(½mk)**
Wrong units award zero

$f = \dfrac{f1+f2}{2} = \dfrac{9.657 + 12.924}{2}$

                        $= 11.2905\text{cm}$
Correct substation   **(½mk)**
Evaluation with unit a must (3sf a must)   **(½mk)**
No unit denial   **(½mk)**
Wrong units award zero