

(e) Plot the graph of  $I$  (A) (y-axis) against  $R$ . (5 marks)

(f) From the graph determine  $R_0$ , the value of  $R$  when the current  $I$  is equal to  $\frac{I_0}{2}$  (i.e. when  $I = \frac{I_0}{2}$ ).

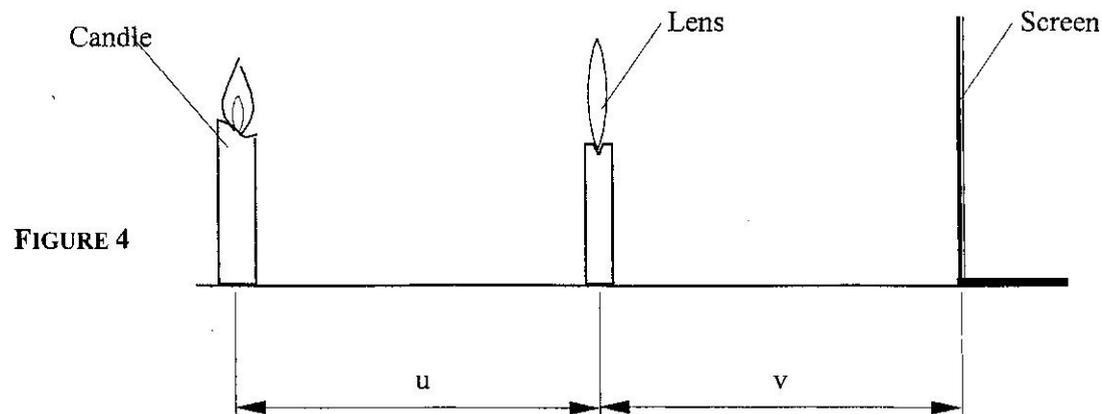
$R_0 =$  \_\_\_\_\_ (3 marks)

**PART B**

You are provided with the following:

- a lens and lens holder
- a candle
- a screen
- a metre rule.

Set up the apparatus as shown in figure 4.



**FIGURE 4**

(g) Starting with  $u = 30$  cm, adjust the position of the screen to obtain a sharp image of the candle. Record the value of  $v$  in Table 3.

(h) Repeat the procedure in (g) for  $u = 20$  cm. Complete the table.

**Table 3**

$u$ (cm)	$v$ (cm)	$m = \frac{v}{u}$
20		
30		

(2 marks)

(i) Given that the focal length  $f$  of the lens satisfies the equation  $f = \frac{v}{1+m}$  determine the average value of the focal length,  $f$ .

(2 marks)