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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**PHYSICS** **5054/03**

Paper 3 Practical Test May/June 2004

**ANSWER BOOKLET** **2 hours**

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen in the spaces provided on this Answer Booklet.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.  
All of your answers should be written in this Answer Booklet: scrap paper must **not** be used.

Answer **all** questions.  
Graph paper is provided in this Answer Booklet. Additional sheets of graph paper should be used only if it is necessary to do so.  
At the end of the examination, fasten any additional answer paper used securely to this Answer Booklet.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
1	
2	
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4	
<b>Total</b>	

**Section A**

1 (a) determination of  $t_1$

(b) calculation of  $T_1$

(c) determination of  $t_2$

calculation of  $T_2$

(d) uncertainty in the measurement of  $t_1$

(e) conclusion

2 (a) diagram of the circuit that has been set up by the Supervisor

(b) record of  $I$

record of  $V$

(c) calculation of  $R_1$  using  $R_1 = V/I$

(d) record of  $V$

record of  $I$

calculation of  $R_2$  using  $R_2 = V/I$

(e) conclusion

3 (a) record of  $\theta_1$

(b) (i) record of  $\theta_2$

(ii) record of  $V_F$

(iii) record of  $V_1$

(iv) record of  $m_1$

(c) calculation of the gain in thermal energy of the ice as it melts using

change in thermal energy on melting =  $m_1 L$ ,

where  $L = 336 \text{ J/g}$

(d) (i) calculation of the gain in thermal energy of the cold water formed from the ice using

change in thermal energy = mass  $\times$  specific heat capacity  $\times$  temperature change

where specific heat capacity of water =  $4.2 \text{ J/(g K)}$  and  $1 \text{ cm}^3$  of water has a mass of 1 g

(d) (ii) calculation of the loss in the thermal energy of the water that was initially at room temperature

(e) comment on the answers obtained in parts (c) and (d)

### Section B

4 (b) record of  $x$

(c) record of  $y$

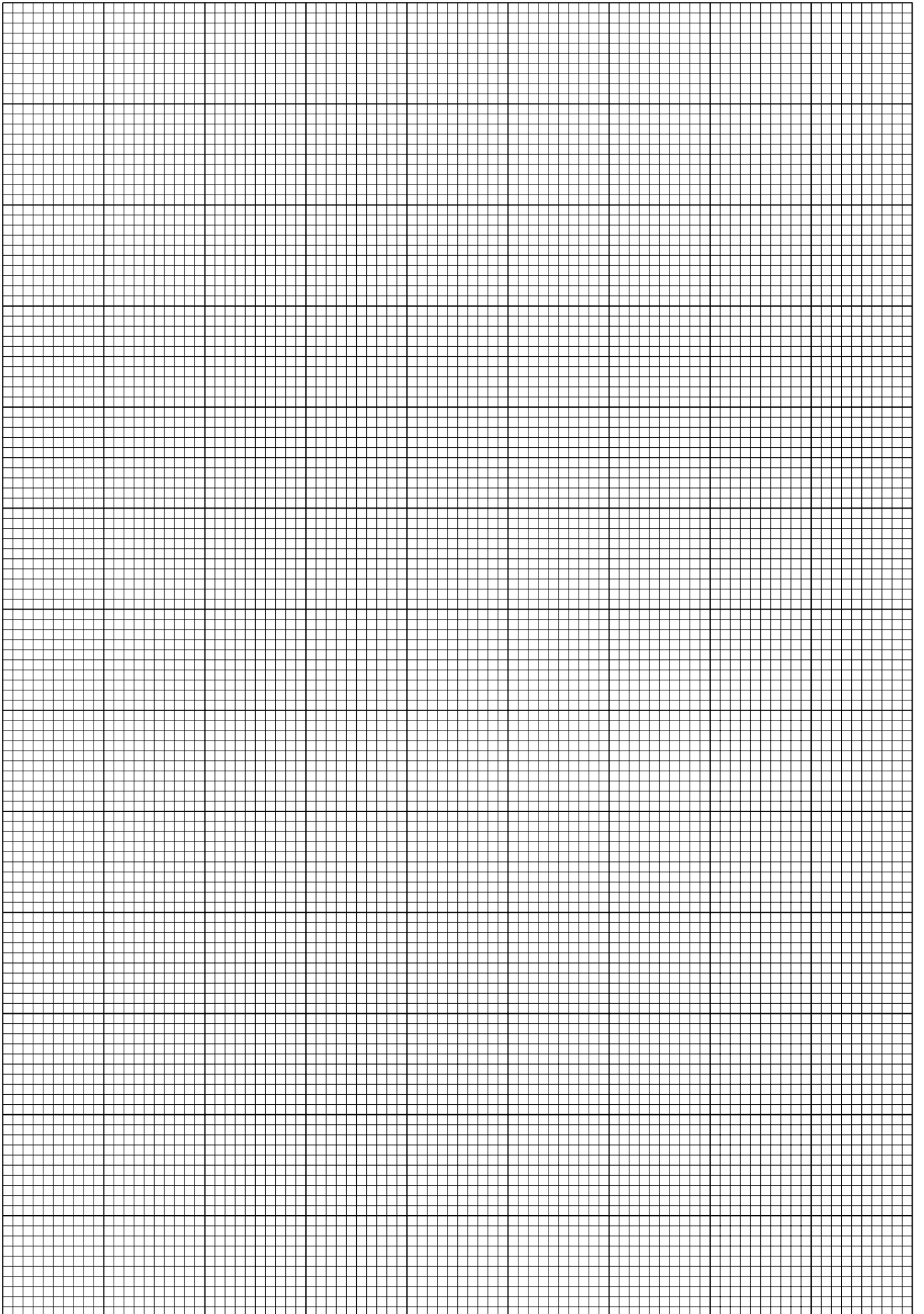
calculation of  $d$  using  $d = x - y$

(d) table of values of  $D$ ,  $x$ ,  $y$ ,  $d$ ,  $(d/D)^2$  and  $1/D$

(e) using the grid on page 7, plot a graph of  $(d/D)^2$  on the  $y$ -axis against  $(1/D)/(1/m)$  on the  $x$ -axis

(f) calculation of  $S$

(g) determination of  $f$  using  $f = -S/4$



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