1. · **You are to spend no more than $\frac{1}{2}$ hour on this question.**

A liquid, A, initially at temperature $T_1 = 28.4°C$, is heated by an immersion heater in a container. The resulting temperature, T_2, is recorded at 1 minute intervals and the following results obtained.

Time, t / min.	0	1	2	3	4	5	6	7
Temperature $T_2/°C$	28.4	36.0	43.1	52.5	60.5	69.0	75.1	84.3
Temperature changes $\Delta T/°C$	0							

(a) Complete the table by computing the temperature changes $\Delta T = T_2 - T_1$.

(4 marks)

(b) Plot a graph of Temperature change, ΔT, against time, t, on page 3.   **(9 marks)**

(c) Find the slope, S, of the graph.

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(5 marks)

(d) C_p the Specific Heat Capacity of the liquid is related to the slope S by:
$C_p = \dfrac{2000}{S}$ J kg^{-1} K^{-1}. Find the Specific Heat Capacity of the liquid.

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(2 marks)

(e) What would the temperature of the liquid after 12 minutes?

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(4 marks)

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(f)   Another liquid, B, has a much higher specific heat capacity than Liquid A. On the same graph paper used in (b) on page 3 sketch (**DO NOT PLOT**) a line showing the approximate graph that would be obtained if Liquid B was the working fluid.

         (2 marks)

(g)   State TWO possible sources of error in this experiment and in EACH case describe a method that might be used to minimize the magnitude of the error.

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         (4 marks)

Total 30 marks