

PHYS 500 (Research Methodology)- Fall 2019

HOMEWORK I (30 marks)

Dr. Vasileios Lempesis

Hand in: Tuesday 24th September 2019 at 23:59

1. The mass of a small glass beaker was measured with a balance and found to be 45.64g. When a liquid was added to the beaker the balance indicated 92.5g. Give the mass of the liquid in the beaker to the appropriate number of significant figures.

(5 marks)

2. In a heat transfer experiment, an amount of heat, Q , is transferred to silver at its melting point, causing mass, m , of the silver to melt. The relationship between m and Q is $Q = mL$, where L represents the heat of fusion of the silver. Given that $L = 88 \times 10^3$ J/kg and $Q = 4550$ J, calculate the mass of silver melted in kg. Express your answer in scientific notation to the appropriate number of significant figures.

(5 marks)

3. Round the following recordings at the digit which is underlined:

Recorded Value	3.1 <u>0</u> 8	59 <u>2</u> 3	6. <u>9</u> 73	0.04 <u>5</u> 6	<u>9</u> .5
Rounded Value					

(5 marks)

4. Fill in the following table by keeping significant figures and rounding properly the recorded values taken in an experiment for a physical quantity:

Recorded value	Before the selection of significant figures		After the selection of significant figures		Final Result
	x	δx	δx	x	
1	4.283	0.01762			
2	91.2	0.0219			
3	27.2679	0.7538			
4	3982	213			
5	11348	84			

(5 Marks)