

---

## UNITS PREFIXES AND SCIENTIFIC NOTATION TEST

1. Give the SI units for the following physical quantities
  - a) length,
  - b) mass,
  - c) acceleration,
  - d) velocity,
  - e) density,
  - f) impulse(6)
3. If a force of 1N is applied to a 3 kg mass what acceleration can this produce? (2)
4. A leaf of mass 0.1g feels a frictional force of 948 $\mu$ N as it falls from a tree. What is its acceleration as it falls? Include a free body diagram of the leaf. (5)
5. Express the following in scientific notation.
  - a) 50mA
  - b) 0.3nF
  - c) 200s
  - d) 45 $\mu$ F(4)

---

## UNCERTAINTIES REVISION TEST

- 1 a) Find the percentage error in the following display. (2)

0	10	20	30	↑ 40	50	60
---	----	----	----	------	----	----

2. Give an example of the following errors,
  - i) Random uncertainties,
  - ii) Systematic effects.(2)

3.

Time/s	1.58	1.55	1.59	1.56	1.56	1.58
--------	------	------	------	------	------	------

Calculate the percentage error in these results. (3)

4. What must you be aware of whenever you are making a measurement? (1)
5. How can you reduce the error that you make in your experiments? (1)

6. What is the best measurement that we can hope for? (1)
7. Draw a diagram illustrating the effects of a systematic error in a set of results. (1)
8. Estimate the scale-reading uncertainty in the following  
a) a voltmeter reading of 0.12V  
b) an ammeter reading of 1.0mA (4)
9. Find the absolute uncertainty in the following readings. (4)

Speed /ms <sup>-1</sup>	0.97	0.92	1.07	1
-------------------------	------	------	------	---

- b) What error has been made when recording the above results? (2)
10. The following results were obtained from an experiment.  
*distance = 1.00 ± 0.01m, time = 0.16 ± 0.02s*  
Calculate the speed from these results and express it in the form final value ± uncertainty. (3)

---

## INTRODUCTION TO OUR DYNAMIC UNIVERSE TEST

1. Produce a table with the headings Scalar and Vectors and see how many scalars and vectors you can add to the table in 60.0s. Two marks for a vector, one mark for a scalar.
2. Three vectors are each 120° apart and directed away from an object. One is 15.0 N, one 25.0N and one 20.0 N, what is the resultant force on the object?
3. A 25 N force acts on a shopping trolley handle at an angle of 50° to the horizontal, state the horizontal and vertical components of this vector.

4. State the measurements that would be required to determine the acceleration of a trolley as it rolled down a slope? Draw a diagram of the set up, state the measurements, equipment and formulae you would use.
5. State the Equations of Motion.
6. Prove as many of the Equations of Motion as possible.