

These are for revision, containing questions on the learning outcomes required for Higher Physics. If you perform badly in one or more sections, please review your work and tell your teacher. It probably means that extra reinforcement is required. The earlier this is picked up the easier it is to deal with. Don't deceive yourselves and us by cheating, it will cause problems later.

All the best! Ms H & Mrs. H

UNITS AND PREFIXES REVIEW

1. Give the SI units for the following physical quantities, state which are base units
a) length, b) mass, c) acceleration, d) velocity, e) charge. (6)
2. If a force of 1 N is applied to a 3 kg mass calculate the acceleration this can produce? (1)
3. A leaf of mass 0.1 g feels a frictional force of 948 μN as it falls from a tree. Determine its acceleration as it falls? (take g as 9.8Nkg^{-1}). Include a free body diagram of the leaf. (3)
4. Express the following in scientific notation.
a) 50mA b) 0.3nF c) 200s d) 45 μF (4)

UNCERTAINTY REVIEW

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

0	10	20	30	↑ 40	50	60
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2. Give an example of the following uncertainties,
i) Random uncertainties, ii) Systematic effects. (2)

3.

Time/s	1.58	1.55	1.59	1.56	1.56	1.58
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Calculate the percentage uncertainty in these results. (3)

4. State with what you must be aware whenever you make a measurement? (1)
5. State how to reduce the uncertainty 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. a) Find the absolute uncertainty in the following readings. (4)

Speed /ms ⁻¹	0.97	0.92	1.07	1
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- b) State the error made when recording the above results? (2)
10. The following results were obtained from an experiment.

$$\text{distance} = 1.00 \pm 0.01\text{m}, \quad \text{time} = 0.16 \pm 0.02\text{s}$$

Calculate the speed from these results and express it in the form final value \pm uncertainty. (3)

SCALAR & VECTORS REVIEW

1. A fly crawls across a desk. Make a sketch of its path and mark on it the *distance* travelled, and the *displacement* of the fly. (3)
2. A dog runs from its kennel to the garden gate and back. Explain how to calculate its *average speed* and its *average velocity*. (2)
3. a) What is the definition of a *vector quantity*? (1)
- b) Give one example each of vector and scalar quantities. (2)
- c) A physicist measures the size of quantity **A** and the angle it makes with some reference line. He then measures the size of quantity **B** and the size of the angle through which a wheel **C** has been rotated. Classify each of these three measurements into either vector or scalar quantities (3)
4. A bus is travelling due North at 12 ms⁻¹, a girl runs West across the bus at 3ms⁻¹, suddenly she is sick and projects this at 2 ms⁻¹ at an angle of 30° North of West. Determine the resultant velocity of the sick? (3)

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5. A farm trailer is moving north at 3.6ms^{-1} while the sheepdog in it walks east across the floor at 2.7ms^{-1} . Use a scale diagram to find the dog's resultant velocity. (3)
 6. State what is meant by the *resultant* of a number of forces. (1)
 7. What are the x and y components of a vector 25 units long making an angle of 30° to the X-axis? (2)
 8. A pond skating insect is blown east by a force of 5.1×10^{-3} N and pushed by the water with a northerly force of 6.8×10^{-3} N while its little feet paddle it west with a force of 10.2×10^{-3} N. Calculate the resultant force on it. (3)