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So what have you learned so far?

*HIGHER REVISION TEST*

**HIGHER PHYSICS COURSE**

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***BOOKLET 3a***

**SECTION Units Prefixes & Sci Notation TEST**

1. Give the SI units for the following physical quantities

a) length, b) mass, c) acceleration, d) velocity, e) energy **(5)**

2. If a force of 1N is applied to a 3 kg mass what acceleration can this produce? **(1)**

3. A leaf of mass 0.1g feels a frictional force of 948μN as it falls from a tree. What is 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) 45μF **(4)**

**SECTION Uncertainties 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 –1 | 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)**

**Section- Introduction to Our Dynamic Universe Test (Part 1)**

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 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)

5. What is meant by the *resultant* of a number of forces? (1)

6. What are the **x** and **y** components of a vector 25units long making an angle of 30o to the X-axis? (2)

7. A pond skating insect is blown east by a force of 5.1x10-3N and pushed by the water with a northerly force of 6.8x10-3N while its little feet paddle it west with a force of 10.2x10-3N. What is the resultant force on it? (3)

**Section – More Introduction to Our Dynamic Universe. (Part 2)**

1. What gives an acceleration of 1ms-2 to a 1kg mass? (1)

2. a) An object is accelerated at 1.8ms-2 by a force of 17 N. What is the mass of the object? (2)

 b) 2x104 N acts on a mass of 1.25x103 kg. What acceleration does this cause? (2)

3. A bird's wings gives it a forward force of 10 N while its body gives it a drag of 8 N. Its mass is 2kg and its flight is horizontal.

 a) Draw a free-body diagram for the bird. (2)

 b) What is the bird's acceleration? (2)

4. a) A girl who weighs 500N runs up a flight of stairs in a time of 20s. If each step is 0.2m high and there are 60 steps in the flight, calculate the girl’s power. (2)

 b) A pendulum bob of mass 1.0 kg is moved sideways until it has risen by a height of 0.45m. Calculate the speed of the bob at its lowest point. (Take *g* as 9.8Nkg-1 ). (2)