Oxford Cambridge and RSA

A Level Physics A

H556/01 Modelling physics

Question Set 1

Multiple Choice Questions

1 Which is the **best** estimate of the area of a rectangular field of length 98 ± 3 m and width 47 ± 2 m?

A 4600 ± 5 m^2

B 4600 ± 6 m^2

C 4600 ± 300 m^2

D 4606 ± 337 m^2

$98 \times 47 = 4606$

% uncertainty 1 $= {}^{3}/_{98} \times 100 = 3.06\%$

% uncertainty 2 $= {}^{2}/_{47} \times 100 = 4.26\%$

$3.06 + 4.26 = 7.32\%$

$\frac{7.32}{100} \times 4606 = 336.9 = 337$

Your answer D

[1]

2 Which of the following units is **not** an S.I. base unit?

A ampere

B mole

C volt

D kilogram

Your answer C

[1]

3 Which set of quantities are all scalar?

A acceleration, displacement, velocity

B energy, mass, power

C extension, force, gravitational potential energy

D weight, kinetic energy, work done

Your answer B

[1]

4 Which set of prefixes **A**, **B**, **C** or **D** are in order of **increasing** magnitude?

A micro, milli, centi, kilo

B milli, centi, micro, kilo

C kilo, centi, milli, micro

D centi, micro, milli, kilo

Your answer A

[1]

5 A solid cylindrical glass rod has length 20.0 ± 0.1 cm and diameter 5.00 ± 0.01 mm.

What is the percentage uncertainty in the calculated volume of this rod?

A 0.1%

B 0.2%

C 0.7%

D 0.9%

$\frac{0.1}{20} \times 100 = 0.5\%$ $\frac{0.01}{5} \times 100 = 0.2\%$

$0.5\% + 0.9\%$ $A = \pi \left(\frac{d}{2}\right)^2$

$= 0.9\%$ $\rightarrow 0.2 \times 2$

$= 0.4\%$

Your answer D

[1]

6 An object is falling.
The weight of the object is 4.5 N.
The wind provides a horizontal force of magnitude *F* on the object.
The **resultant** force on the object is 5.8 N.
Air resistance and upthrust on the object are negligible.

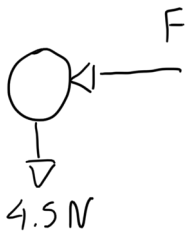
What is the value of *F*?

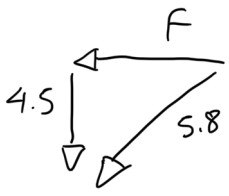
A 1.3 N

B 3.7 N

C 7.3 N

D 13 N





$a^2 + b^2 = c^2$

$F^2 + 4.5^2 = 5.8^2$

$F^2 = 5.8^2 - 4.5^2$

$F = \sqrt{5.8^2 - 4.5^2}$

$= 3.659\,N$

$= 3.7\,N$

Your answer B

[1]

Total Marks for Question Set 1: 6