T1 Key Concepts of Physics (paper 2)

Section A

What is 3.333 written to three significant figures?

- ☐ **A:** 3.33
- ☐ **B:** 3.34
- ☐ **C:** 3.00
- ☐ **D:** 3

2) What is 3.333 written to two decimal places?

- ☐ **A:** 3.33
- ☐ **B:** 3.34
- ☐ **C:** 3.00
- ☐ **D:** 3

3) What is 2.55 written to two decimal places?

- ☐ **A:** 2.56
- ☐ **B:** 2.60
- ☐ **C:** 2.50
- ☐ **D:** 2.55

4) What is 2.55 written to one significant figure?

- ☐ **A:** 2.00
- ☐ **B:** 2.5
- ☐ **C:** 3
- ☐ **D:** 2.6

5) What is 9.99 written to two significant figures?

- ☐ **A:** 9.99
- ☐ **B:** 9.90
- ☐ **C:** 10
- ☐ **D:** 9.0

6) What is 0.08744 written to three significant figures?

- ☐ **A:** 0.09
- ☐ **B:** 0.0874
- ☐ **C:** 0.0875
- ☐ **D:** 0.0900

7) Which of these is the most appropriate answer to 30.5 × 22 ?

- ☐ **A:** 671
- ☐ **B:** 670
- ☐ **C:** 671.00
- ☐ **D:** 671.5

8) Which of these is the most appropriate answer to 20 ÷ 3 ?

- ☐ **A:** 6.67
- ☐ **B:** 6.7
- ☐ **C:** 7.00
- ☐ **D:** 7

9) Which of these is the most appropriate answer to 16.0 ÷ 5.0 ?

- ☐ **A:** 3.2
- ☐ **B:** 3.20
- ☐ **C:** 3.0
- ☐ **D:** 3.00

Section B

Draw one line from each quantity to match it to the standard unit that it must be converted to before being used in a calculation

Quantity
Power
Electric Current
Magnetic Flux Density
Temperature
Electric Potential Difference
Work Done
Specific Heat Capacity
Electric Charge

Unit	**Abbreviation**
Ampere	A
Watt	W
Kelvin	K
Volt	V
Coulomb	C
Tesla	T
Joules per kilogram degrees centigrade	J/kg°C
Joule	J

How to convert times

		time	**abbreviation**
		week	wk
÷ 7	**× 7**		
		day	d
÷ 24	**× 24**		
		hour	h *or* hr
÷ 60	**× 60**		
		minute	min
÷ 60	**× 60**		
		Second, s	
÷ 1000	**× 1000**		
		millisecond	ms

Convert each of these times into seconds

5 min	1 hour
0.5 min	20 ms
0.02 h	2 days
0.1 ms	90 min

Fill the gaps in this chart detailing how to convert between different metric prefixes

smaller to bigger each step is **÷ 1000**

bigger to smaller each step is **x 1000**

prefix	**abbreviation**
Tera-	T
	G
Mega	
Standard unit. e.g. m	
micro-	
	n
pico-	p

Convert each of these values into standard units.

20 kJ	0.25 MW
30 µm	700 nm
20 000 mm	650 ma
0.003 GJ	0.25 kV

Link to BBC Bitesize

REVQ1.2a
A student correctly estimated the length of a wasp.
The length of a wasp is about 20.0

(1)

- ☐ **A** mm
- ☐ **B** cm
- ☐ **C** m
- ☐ **D** km

REVQ1.2b
A brick has a volume of 0.002 m^3 and a mass of 2.8 kg.
Calculate the density of the brick, giving your answer to a suitable number of significant figures.

(3)

Use the equation
density = mass ÷ volume

density = ... kg/m^3

REVQ1.2c
A different brick h as a mass of 3250 g and a volume of 0.0019 m^3 .
Calculate the density of the brick in kg/m^3

(3)

Use the equation
density = mass ÷ volume

density = ... kg/m^3

REVQ1.2d
Show that a wave speed of 0.20 m/s is faster than a wave speed of 0.70 km/h.

(2)

REVQ1.2e
The specific heat capacity of water is roughly 4200 $J/kg°C$.
Calculate the energy required to raise the temperature of 5000 g of water by 25 °C.
Give your answer to two significant figures and include the unit.

(3)

Use the equation
change in energy = mass x specific heat capacity x temperature change

REVQ1.2f
A student correctly estimated the diameter of an atom.
The diameter of an atom is about 0.1

(1)

- ☐ **A** Gm
- ☐ **B** μm
- ☐ **C** mm
- ☐ **D** nm

Energy = ... unit .....

Section C

REVQ1.2g
An American nickel coin has a mass of 5.0×10^{-3} kg and a volume of 5.7×10^{-7} m^3.
Calculate the density of the coin, giving your answer to two significant figures.

(3)

Use the equation
density = mass ÷ volume

density = ... kg/m^3

REVQ1.2h
A student correctly estimated the mass of their parent's car.
The car was roughly 2.5

(1)

- ☐ **A** μg
- ☐ **B** Mg
- ☐ **C** kg
- ☐ **D** mg

REVQ1.2i
An electric fan is connected to a 24 V power supply.
A current of 500 mA flows through the heater.
Calculate how much energy is transferred to the heater in 20 minutes.

(3)

Use the equation
energy = current × potential difference × time

Energy = ... unit .....

Section D

DOWN
1. measured in V (9,10)
2. the standard unit for work done (5)
6. 2.3333 is a number written to ..... decimal places (4)
7. the number of seconds in half a minute (6)
8. the metric prefix that means '1000× smaller than the standard unit' (5)
10. the metric prefix that means '1000× larger than the standard unit' (4)

ACROSS
3. the standard unit for electric charge (7)
4. the standard unit for power (4)
5. measured in kg (4)
7. 0.13 is a number written to ..... significant figures (3)
9. the standard unit for force (6)
10. the standard unit for temperature (6)
11. the number of hours in 14400 s (4)