SMART EXAM RESOURCES
9702 PHYSICS TOPIC QUESTIONS
TOPIC: PHYSICAL QUANTITIES AND UNITS
SUB-TOPIC: PHYSICAL QUANTITIES AND UNITS
SUB-SUB-TOPIC:ESTIMATE OF PHYSICAL QUANTITIES
SET-2-QP-MS

1 Make reasonable estimates of the following quantities.

(a) the frequency of an audible sound wave

frequency = ... Hz [1]

(b) the wavelength, in nm, of ultraviolet radiation

wavelength = ... nm [1]

(c) the mass of a plastic 30 cm ruler

mass = ... g [1]

(d) the density of air at atmospheric pressure

density = ... kg m^{-3} [1]

Mark Scheme:

(a)	allow anything in range 20 Hz → 20 kHz	B1	[1]
(b)	allow anything in range 10 nm → 400 nm	B1	[1]
(c)	allow anything in range 10 g → 100 g	B1	[1]
(d)	allow anything in range 0.1 kg m^{-3} → 10 kg m^{-3}	B1	[1]

2 Give estimates for the diameter of

(i) an atom,

.....[1]

(ii) a nucleus.

.....[1]

Mark Scheme:

(i) allow 10^{-9} m $\rightarrow$ 10^{-11} m — B1 [1]

(ii) allow 10^{-13} m $\rightarrow$ 10^{-15} m — B1 [1]
(*if* ***(i)*** *and* ***(ii)*** *out of range but* ***(ii)*** = 10^{-4}***(i)***, *then allow 1 mark*)
(*if no units or wrong units but* ***(ii)*** = 10^{-4}***(i)***, *then allow 1 mark*)

3 Make estimates of the following quantities.

(a) the speed of sound in air

speed = ... [1]

(b) the density of air at room temperature and pressure

density = ... [1]

(c) the mass of a protractor

mass = ... [1]

(d) the volume, in cm^3, of the head of an adult person

volume = ... cm^3 [1]

Mark Scheme:

(a)	allow 100 m s^{-1} → 900 m s^{-1}	B1	**[1]**
(b)	allow 0.5 kg m^{-3} → 1.5 kg m^{-3}	B1	**[1]**
(c)	allow 5 g → 50 g	B1	**[1]**
(d)	allow 2×10^3 cm^3 → 9×10^3 cm^3	B1	**[1]**