Cambridge A-LEVEL Topical Past Papers

PHYSICS

PAPER 1 2020 — 2025

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1 - (9702/11_Summer_2020_Q1)

What is a reasonable estimate of the kinetic energy of a car travelling at a speed of 30 $m\,s^{-1}$?

A 10^2 J **B** 10^4 J **C** 10^6 J **D** 10^8 J

2 - (9702/11_Summer_2020_Q2)

The frequency f of vibration of a mass m supported by a spring with spring constant k is given by the equation

$$f = Cm^p k^q$$

where C is a constant with no units.

What are the values of p and q?

	p	q
A	$-\frac{1}{2}$	$-\frac{1}{2}$
B	$-\frac{1}{2}$	$\frac{1}{2}$
C	$\frac{1}{2}$	$-\frac{1}{2}$
D	$\frac{1}{2}$	$\frac{1}{2}$

3 - (9702/11_Summer_2020_Q3)

The power produced by a force moving an object is given by the equation shown.

$$\text{power} = \frac{\text{work}}{\text{time}} = \frac{\text{force} \times \text{displacement}}{\text{time}}$$

Which quantities are scalars and which are vectors?

	scalars	vectors
A	displacement, time	force, power
B	power, work	displacement, force
C	power, force	displacement, work
D	work, time	power, displacement

4 - (9702/12_Summer_2020_Q1)

What is a reasonable estimate of the mass of a raindrop?

A 10^{1} kg **B** 10^{-1} kg **C** 10^{-3} kg **D** 10^{-5} kg

5 - (9702/13_Summer_2020_Q1)

A man is running a race in a straight line.

What is an approximate value of his kinetic energy?

A 10 J **B** 100 J **C** 1000 J **D** 10 000 J

6 - (9702/13_Summer_2020_Q3)

Which characteristics are possessed by a vector quantity but **not** by a scalar quantity?

A direction only

B magnitude and direction

C magnitude and unit

D unit only

7 - (9702/11_Winter_2020_Q1)

Which quantity is a physical quantity?

A atomic number

B efficiency

C number density of charge carriers

D strain

8 - (9702/11_Winter_2020_Q2)

Which time interval is the shortest?

A 0.05 ms **B** 50 ns **C** 500 000 ps **D** 0.5 μs

9 - (9702/12_Winter_2020_Q1)

A student uses the volume of a metal coin in order to determine the density of the metal.

What is **not** needed in order to determine an estimate of the volume of the coin?

A estimate of the diameter

B estimate of the mass

C estimate of the thickness

D use of the formula for the volume of a cylinder

10 - (9702/12_Winter_2020_Q2)

The speed v of waves on a stretched wire is given by the equation

$$v = T^p \mu^q$$

where T is the tension in the wire and μ is the mass per unit length of the wire.

What are the values of p and q?

	p	q
A	$-\frac{1}{2}$	$-\frac{1}{2}$
B	$-\frac{1}{2}$	$\frac{1}{2}$
C	$\frac{1}{2}$	$-\frac{1}{2}$
D	$\frac{1}{2}$	$\frac{1}{2}$

11 - (9702/13_Winter_2020_Q1)

What is a reasonable estimate of the volume of a fully inflated standard football?

A $600\,cm^3$ **B** $6000\,cm^3$ **C** $60\,000\,cm^3$ **D** $600\,000\,cm^3$

1 – C
2 – B
3 – B
4 – D
5 – C
6 – A
7 – C
8 – B
9 – B
10 – C
11 – B
12 – A
13 – D
14 – C
15 – B
16 – B
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18 – A
19 – D
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