GET BETTER AT PHYSICS · MARK SCHEME

SI Units & Prefixes: tiered multiple choice

AQA A-level Physics · 7407 / 7408 · Specification 3.1.1 · 6 questions · 6 marks

1 mark per correct letter | Worked reasoning for every question | **How students did** = from AQA examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5	Q6
D	B	C	D	A	B

Easy

Questions 1–3

1 **D**

Ordering forces with prefixes · AQA June 2018 · AS Paper 2 · Q14

f = 10^{-15}, p = 10^{-12}, G = 10^{9}, T = 10^{12}. So 2 fN < 2 pN < 2 GN < 2 TN.

Watch out: Femto (f) is smaller than pico (p), and giga (G) is smaller than tera (T).

How students did: 58.1% of students got this right in June 2018.

2 **B**

Unit of the area under a force–time graph · AQA June 2018 · A-level Paper 1 · Q7

Area under a force–time graph = force × time = impulse (change in momentum). Its unit is N s = kg m s^{-2} × s = kg m s^{-1}.

Watch out: N m (A) is the unit of work or moment, from a force–distance graph.

How students did: 67.6% of students got this right in June 2018.

3 **C**

Two quantities with the unit kg m^2 s^{-2} · AQA June 2022 · A-level Paper 1 · Q7

kg m^2 s^{-2} = (kg m s^{-2}) × m = N m. Work done (force × distance) and the moment of a couple (force × perpendicular distance) both have this unit.

Watch out: Momentum is kg m s^{-1}, the Young modulus and pressure are kg m^{-1} s^{-2}.

Medium

Questions 4–6

4 **D**

Quantities with the unit kg m^{-1} s^{-2} · AQA June 2019 · AS Paper 2 · Q5

kg m^{-1} s^{-2} = (kg m s^{-2}) ÷ m^2 = N m^{-2} = Pa. Tensile stress (force ÷ area) has this unit, and so does the Young modulus (stress ÷ strain, where strain has no unit).

Watch out: Kinetic energy and the moment of a force are both kg m^2 s^{-2}.

How students did: In June 2019 many students had difficulty working with base units here.

5 **A**

Prefixes in order of increasing size · AQA June 2024 · AS Paper 2 · Q34

f (10^{-15}) < p (10^{-12}) < μ (10^{-6}) < c (10^{-2}). That is row A.

Watch out: Centi (10^{-2}) is much larger than micro (10^{-6}).

How students did: In June 2024 the correct answer was the most popular choice.

6 **B**

Base-unit form of the ohm · AQA June 2018 · AS Paper 2 · Q33

R = V / I. V = energy ÷ charge = J C^{-1}, and I = charge ÷ time = C s^{-1}. So Ω = J C^{-1} ÷ (C s^{-1}) = J C^{-2} s.

Watch out: Dividing by C s^{-1} multiplies by s, so s goes on top: option B, not A.

How students did: Just over 30% of students got this right in June 2018.

End of mark scheme. Answers from AQA's published keys; explanations written for this pack. AQA material is © AQA. More free packs and 1-to-1 tuition: **www.getbetteratphysics.co.uk**

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