GET BETTER AT PHYSICS · MARK SCHEME

Capacitance & Energy Stored: tiered multiple choice

Edexcel IAL Physics · Unit 4 (WPH14) · Specification points 100–101 · 5 questions · 5 marks

1 mark per correct letter

Worked reasoning for every question

How students did = from Pearson examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5
D	D	C	A	D

Easy

Questions 1–4

1 **D**

Energy stored from a Q–V graph · Edexcel IAL October 2022 · Unit 4 · Q5

Energy stored = area under the Q–V graph = ½QV. With Q = 550 nC = 550 × 10^{-9} C and V = 12 V: W = (550 × 10^{-9} × 12)/2.

Watch out: Convert nC to C before calculating.

How students did: 84% of students got this right in October 2022.

2 **D**

Charge stored by two capacitors in parallel · Edexcel IAL January 2024 · Unit 4 · Q7

Each capacitor still has the full p.d. V across it, so each stores Q = CV. The total charge is 2Q. (The combined capacitance in parallel is 2C.)

How students did: 74% of students got this right in January 2024.

3 **C**

Work done by a battery charging a capacitor · Edexcel IAL October 2021 · Unit 4 · Q7

The battery moves charge Q through its full e.m.f. V, so it does work QV. The energy stored by the capacitor is the area under its Q–V graph, ½QV. The other half is dissipated as heat in the circuit resistance.

How students did: 66% of students got this right in October 2021.

4 **A**

Ratio of energies stored by two capacitors · Edexcel IAL January 2025 · Unit 4 · Q10

$W = \frac{1}{2}CV^2$. $C_1 = \frac{1}{2}C_2$ and $V_1 = \frac{1}{2}V_2$, so $W_1/W_2 = \frac{1}{2} \times (\frac{1}{2})^2 = 1/8$.

Medium

Question 5

5 **D**

Energy stored when the p.d. doubles · Edexcel IAL June 2022 · Unit 4 · Q3

$W = \frac{1}{2}CV^2$, so $W \propto V^2$ for the same capacitor. Doubling V multiplies the energy by $2^2 = 4$: 4W.

Watch out: Energy depends on V squared; the charge only doubles.

How students did: 42% of students got this right in June 2022.

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

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