

YEAR 2 | MODULE 6 | PACK 01

Charge and stored energy

Official past-paper mark scheme

2017-2023 | OCR A H556 | 6.1.1(a), (d); 6.1.2(a)-(c)

10 marks | 3 question entries

One practice session

Match each extract using its question number and stable CP identifier. Original OCR answers, examiner guidance, alternatives, diagrams and level descriptors are preserved.

The heading gives the maximum marks for the assigned subparts. Alternative methods and "any n from" lists offer routes to those marks; do not add every printed point together.

Click a source reference to open OCR's full official mark scheme. Keep this file closed while attempting the questions.

Reserved: all 2024 and 2025 papers are excluded. These files contain official examination questions only; no sample, specimen or practice papers.

Question index

CP identifiers are stable across the question packs and mark schemes; Q numbers refer to this pack. All MCQs appear first.

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Q01 CP01	1	3
June 2017 H556/02 Q7		
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Q01 | CP01

1 mark

June 2017 | H556/02 | Q7

Question	Answer	Marks	Guidance
7	A	1	

Q02 | CP12B

4 marks

June 2019 | H556/03 | Q3(b)(i)-(ii)

Question			Answer	Marks	Guidance
	(b)	(i)	$Q = 9.0 \times 10^{-3} \times 2 \times 80 = 1.44 \text{ (C)}$ $W = (Q^2/2C =) 1.44^2/2 \times 0.12$ $W = 8.6(4) \text{ (J)}$	C1 C1 A1	ECF for incorrect Q e.g. 2/3 for use of $Q = 0.72\text{(C)}$ giving $W = 2.2\text{(J)}$
		(ii)	$(W = Pt \text{ so } 8.6 = 0.050t)$ $t = 8.6/0.050 = 170 \text{ (s)}$	A1	ECF (b)(i) for incorrect W

Q03 | CP21AB

5 marks

June 2023 | H556/03 | Q5(a)-(b)

Question			Answer	Mark	Guidance
5	(a)	(i)	$(W = \frac{1}{2} C V^2 \text{ so})$ $400 \times 10^6 = 0.5 \times C \times (24 \times 10^3)^2$ C = 1.4 (F)	C1 A1	Allow $W = \frac{1}{2} Q V$ and $C = Q / V$ $(Q = 3.3 \times 10^4 \text{ (C) so})$ $C = Q / V = 3.3 \times 10^4 / 24 \times 10^3$
		(ii)	(putting capacitors in parallel) increases the total capacitance ORA	B1	Allow $C_T = C_1 + C_2 + \dots$ or capacitors add together (in parallel) Ignore capacitors in parallel can store more charge/energy
	(b)		power $\approx 400 \times 10^6 / 10^{-3} = 4.0 \times 10^{11} \text{ (W)}$ power required is equivalent to output of ≈ 400 power stations or time taken for power station to release stored energy $= 400 \times 10^6 / 10^9 = 0.40 \text{ s}$ 0.4s is (much) longer than 1 ms	M1 A1 (M1) (A1)	Allow ECF (a)(i) for incorrect POT in 400GW Allow this is <u>much</u> more than could be provided by one power station or $4.0 \times 10^{11} \text{ (W)} \gg 1 \text{ GW}$ Ignore comments about household supply Allow ECF (a)(i) for incorrect POT in 400GW Allow it would take more time / too long