

YEAR 2 | MODULE 6 | PACK 01

Point charges, force and potential energy

Official past-paper mark scheme

2017-2023 | OCR A H556 | 6.2.1(a)-(b), (d); 6.2.2(a)-(b); 6.2.4(b)-(e)

15 marks | 7 question entries

One practice session

Match each extract using its question number and stable EF 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.

Sources: the 2024 and 2025 exams are not used in these topic packs. These files contain official examination questions only; no sample, specimen or practice papers.

Question index

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

Question / source	Marks	Page
Q01 EF01 June 2019 H556/02 Q2	1	3
Q02 EF02 June 2019 H556/02 Q8	1	3
Q03 EF03 November 2020 H556/02 Q13	1	3
Q04 EF04 November 2021 H556/02 Q4	1	3
Q05 EF05 June 2018 H556/02 Q8	1	3
Q06 EF06 June 2018 H556/02 Q23(b)(i)-(ii)	4	4
Q07 EF07 November 2020 H556/03 Q6(a)-(b)	6	5

Q01 | EF01**1 mark**

June 2019 | H556/02 | Q2

Question	Answer	Marks	Guidance
2	D	1	

Q02 | EF02**1 mark**

June 2019 | H556/02 | Q8

Question	Answer	Marks	Guidance
8	B	1	

Q03 | EF03**1 mark**

November 2020 | H556/02 | Q13

Question	Answer	Marks	Guidance
13	A	1	

Q04 | EF04**1 mark**

November 2021 | H556/02 | Q4

Question	Answer	Marks	Guidance
4	C	1	

Q05 | EF05**1 mark**

June 2018 | H556/02 | Q8

Question	Answer	Marks	Guidance
8	A	1	

Q06 | EF06

4 marks

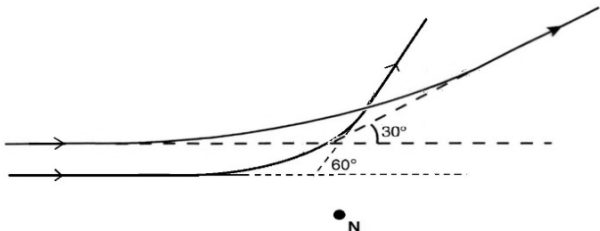
June 2018 | H556/02 | Q23(b)(i)-(ii)

Question			Answer	Marks	Guidance
	(b)	(i)	Kinetic energy (of proton) changes to potential (energy) or Potential energy increases as the kinetic energy (of the proton) decreases or Potential energy increases as work is done against the field / against repulsion / positive charge	B1	Allow 'it' / PE for (electric) potential energy Allow KE / E_k
		(ii)	energy = $0.52 \times 10^6 \times 1.60 \times 10^{-19}$ or $8.3(2) \times 10^{-14}$ (J) $\frac{1.60 \times 10^{-19} \times 27 \times 1.60 \times 10^{-19}}{4\pi\epsilon_0 R} = 8.32 \times 10^{-14}$ $R = 7.5 \times 10^{-14}$ (m)	C1 C1 A1	Allow 2 mark for 1.6×10^{-13} (m); $Z = 59$ used Allow 2 mark for 8.9×10^{-14} (m); $Z = 32$ used Allow 1 mark for 2.8×10^{-15} (m); $Z = 1$ used Allow 1 mark for 1.2×10^{-32} (m); energy = 5.2×10^5 used

Q07 | EF07

6 marks

November 2020 | H556/03 | Q6(a)-(b)

Question			Answer	Marks	Guidance
6	(a)			B1 Path is initially horizontal and further up the page than original B1 Path <u>ends</u> at 30° to horizontal (angle must be labelled) in the direction shown	
	(b)		$Q = 79e$ and $q = 2e$ $F = (1/4\pi\epsilon_0)Qq/r^2$ $= 79 \times 2 \times (1.6 \times 10^{-19})^2 / [4\pi \times 8.85 \times 10^{-12} \times (6.8 \times 10^{-14})^2]$ $= 7.9 \text{ (N)}$	C1 C1 C1 A1	Apply ECF for wrong charge(s), e.g. Q and/or $q = e$, or $Q = 79$ and/or $q = 2$, etc