



Mark Scheme (Results)

November 2025

Pearson Edexcel International GCSE in Physics
4PH1/2P

Question Number	Answer	Notes	Marks
1 (a)	idea of loss of electrons;	allow “negative charge” for electrons	1
(b) (i)	0.57 (N);	ignore sign	1
(ii)	substitution; evaluation; correct answer = 2.4 N cm e.g. moment = force $\times$ distance moment = 0.57×4.2 moment = 2.394 (N cm)	correct answer scores 2 marks allow 2.39, 2.394 (N cm) condone 2, 2.3 (Ncm) allow for 2 marks 0.024 Nm, 0.0239 Nm, 0.2394 Nm if candidate has made unit clear or 1 mark if unit is incorrect/not clear	2
(iii)	candidate’s answer from (ii);	allow rounded or unrounded ignore sign	1
(iv)	arrow going downwards;	by eye ignore length of arrow ignore label	1

Total for question 1: 6 marks

Question Number	Answer	Notes	Marks
2 (a) (i)	idea that gravitational field strength and diameter are both continuous variables;	allow 'the data', 'this data' etc for both variables allow RA i.e. 'not discrete' or 'not discontinuous' or 'not categoric'	1
(ii)	data from a single row selected; constant calculated; constant for a second row calculated; valid conclusion consistent with comparison of (at least) two constant values;	allow values next to table ignore POT ignore SF unrounded values for the constant are: 1656200000 1652400000 1675800000 1670400000	4
(b)	C (mass) <i>A does not affect gravitational field strength</i> <i>B does not affect gravitational field strength</i> <i>D does not affect gravitational field strength</i>		1

Total for question 2: 6 marks

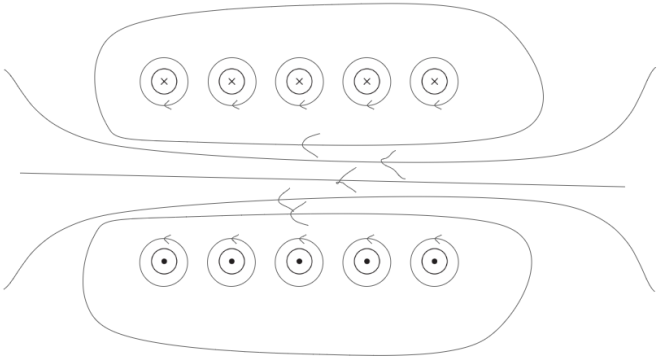
Question Number	Answer	Notes	Marks
3 (a) (i)	momentum = mass $\times$ velocity;	$p = m \times v$	1
(ii)	substitution; correct evaluation; e.g. $120\,000 = 14\,000 \times v$ $v = 120\,000 \div 14\,000 = 8.57$ momentum = 8.6 (m/s) to 2 s.f.	accept any answer that rounds to 8.6 (m/s)	2
(iii)	initial momentum - final momentum; substitution into given formula; correct evaluation; correct answer: 9.3 (s) e.g. change in momentum = $120\,000 - 63\,000$ (kg m/s) change in momentum = 57 000 (kg m/s) time = change in momentum $\div$ force time = $57\,000 \div 6100$ time = 9.3 (s)	accept any answer that rounds to 9.3 (s) accept any answer that rounds to 20 (s) for 1 mark accept any answer that rounds to 10 (s) for 1 mark	3
(b)	transferred mechanically; the KE store of the turbine increases; some energy is transferred to the thermal store of the surroundings/turbine;	ignore references to electrical energy, sound energy reject mechanical energy allow '...to the KE store of the turbine' reject mechanical energy alternate: MP1 'KE of water transfers to KE of turbine' MP2 idea that not all of the KE of water goes to KE of turbine i.e. most of the KE of the water goes to the KE of the turbine'	3

		MP3 reference to some (of the KE of water) is lost as heat or thermal energy to the surroundings NB marks can only be scored either from the original or alternate, not from both	
(c)	Any two from: coal; gas; oil; petrol; diesel; kerosene; uranium; plutonium; nuclear; fossil fuels;	ignore power, station, power station, energy	2

Total for question 3: 11 marks

Question Number	Answer	Notes	Marks
4 (a)	MP1 measure the period; MP2 (determine frequency by using) $f = 1/T$; PLUS any THREE from: MP3 use of a mic(ophone); MP4 reference to a steady trace/eq; MP5(by) counting the squares (for at least one wave); MP6 (and) multiplying number of squares by the time base/eq; MP7 for two or more waves and averaging;	allow MPs from (labelled) diagram allow 'time for one wave / cycle' or 'time between two consecutive peaks/troughs' for period allow reasonable alternatives for measure e.g. determine, calculate allow idea of adjustment to a set number of waves e.g. find time for multiple waves and dividing by number of waves unqualified 'repeat and average' does not score MP	5
(b)	(i) attempt at measuring average period; one period = 5.6 squares; period = 5.6 squares $\times$ 0.5 = 2.8 ms; (ii) candidate uses answer to (i), in seconds, in given formula and evaluated correctly; e.g. period = 0.0028 seconds frequency = $1/T = 1/0.0028$ frequency = 360 (Hz) to 2sf	allow 5.4-5.8 allow ECF on number of squares accept correct rounded or unrounded figure e.g. 357, 357.1 etc	3 1

Total for question 4: 9 marks

Question Number	Answer	Notes	Marks
5 (a) (i)	(at least) one field line (which does not cross) and is consistent with the correct field line pattern; arrow head on at least one field line that is consistent with current direction in solenoid; 	e.g. see diagram for non-exhaustive examples of acceptable field lines apply list principle reject field lines that start/finish on a wire	2
(ii)	clear indication from the candidate which end is north consistent with their field line and no further than two wires 'in'.	however ressed (but including "N" or "North") accept ECF from (i)	1
(b) (i)	$N_p / N_s = V_p / V_s$	any correct rearrangement. Allow word equation Allow "T", "turns" for N. Allow clear yet different annotation from primary and secondary i.e. p and s, 1 and 2, A and B etc.	1
(ii)	substitution; rearrangement; correct evaluation; e.g. $180/345 = V_p/230$ $V_p = 230 \times 180 / 345$	NB substitution into an incorrectly arranged formula scores zero.	3

	$V_p = 120\text{ V}$		
(iii)	step up (transformer);		1
(iv)	alternating (current)/a.c.;		1

Total for question 5: 9 marks

Question Number	Answer	Notes	Marks
6 (a)	substitution into given equation; rearrangement to find wavelength; correct evaluation; e.g. $(\lambda - 506)/506 = 1.7 \times 10^4 / 3.0 \times 10^5$ $\lambda = 506 \times (1.7 \times 10^4 / 3.0 \times 10^5) + 506$ $\lambda = 534.7 \text{ (nm)}$	allow $\Delta\lambda$ for change in wavelength POT error -1 here on either $\Delta\lambda$ or λ evidence of $\Delta\lambda$ of 29 nm scores first 2 marks accept any value that rounds to 530 (nm) accept any value that rounds to 29nm (change in wavelength) as final answer for 2 marks accept any value that rounds to 480 nm (subtraction of change in wavelength) for 2 marks wrong change in wavelength added to 506 nm gives 1 mark	3
(b)	Any TWO from: the universe is expanding / eq; idea that (recession) velocity increases with distance/eq; explicit statement that galaxy C is moving faster than galaxy B (from Earth); double the distance (from Earth) will give double the speed; idea that galaxy C is moving four times faster than galaxy A and galaxy B is moving two times faster than galaxy A;	i.e. galaxies are moving away from each other; i.e. 'galaxies' velocities (away from Earth)' for 'recession velocity' e.g. C is twice as fast as B allow higher order thinking e.g. distance and velocity proportional	2
(c)	Any TWO from: MP1 idea that wavelength of CMB has increased over time (as the universe has expanded); MP2 Universe was (significantly) hotter in the past/eq;	accept RA	2

	MP3 temperature is inversely proportional to wavelength (of CMB)		
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Total for question 6: 7 marks

[illegible]

Total for question 7: 9 marks	
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[illegible]

	(ii) original activity halved at least once; 60 years corresponds to 5 half lives; correct evaluation; e.g. 72→36→18→9→4.5→2.25 (kBq)	however ressed e.g. $60 \div 12 = 5$ accept 2.2 or 2.3 (kBq) 36 (kBq) scores 1 mark only accept any correct activity from another incorrect number of halvings for 2 marks e.g. 18, 9, 4.5, 1.125 etc	
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Total for question 8: 13 marks