Answers – Revision Question – 27 May 2026

1.

Question Number:	Answer	Additional Guidance	Mark
(a)(i)	1.5 (V)	accept $\frac{12}{8}$ or $\frac{3}{2}$ or $1\frac{1}{2}$	**(1)** AO 3 1b

Question Number:	Answer	Additional Guidance	Mark
(a)(ii)		allow ecf from a(i) for all marking points	**(4)** AO 2 1
	recall and substitution (1) $0.75 = I \times 1.5$	substitution and rearrangement in either order	
	rearrangement (1) $(I =) \frac{0.75}{1.5}$ (= 0.5)		
	recall, substitution and rearrangement (1) $R = \frac{1.5}{0.5}$	allow ecf of current from MP2 for this mark point only	
	evaluation (1) (R =) 3.0 (Ω)	allow other approaches such as $P = \frac{V^2}{R}$ scores 1 mark $0.75 = \frac{1.5^2}{R}$ scores 2 marks $R = \frac{(1.5)^2}{0.75}$ scores 3 marks award full marks for correct answer without working	

Question Number	Answer	Mark
(b)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1(6 marks) Circuit diagram including • power supply • ammeter • voltmeter • filament lamp • means of varying potential difference Description of method • measure current with ammeter • measure potential difference with voltmeter • vary the potential difference • calculate the resistance • repeat and compare	(6) AO 1 2

2.

(a)

Answers	Extra information	Mark
	in this order only	
potential difference	allow p.d. allow voltage	1
temperature		1

(b)

the current increases (when the potential difference increases)		1
(which) causes the temperature of the filament to increase		1
(so) the resistance increases	do **not** accept resistance increases and then levels off	1

(c)

a higher proportion / percentage of the (total) power / energy input is usefully transferred **or** higher (useful) power / energy output for the same (total) power / energy input	wastes less energy is insufficient	1

(d)

potential difference increases		1
current decreases		1

(e)

1000 (Ω)	reason only scores if R =1000 (Ω)	1
potential difference is shared in proportion to the resistance	allow a justification using a correct calculation	1

(f)

	an answer of 1.7×10^{-3} (A) scores **4** marks	
$12 = I \times 7000$		1
$I = \frac{12}{7000}$		1
$I = 1.71 \times 10^{-3}$ (A)	an answer that rounds to 1.7×10^{-3} (A) scores **3** marks	1
$I = 1.7 \times 10^{-3}$ (A) **or** I = 0.0017 (A)	this answer only	1
	an answer of 2.4×10^{-3} (A) scores **2** marks	
	if no other marks scored allow **1** mark for calculation of total resistance (7000 Ω)	

3.

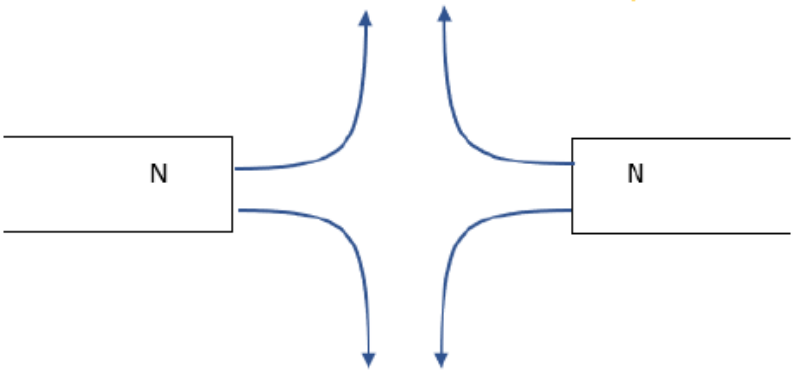
(a)

The (current in the wire) produces a magnetic field ✓	**3**	**2.2**
The magnetic field of the magnet and the magnetic field of the wire interact (to exert a force on each other) ✓		**2.2** **2.2**
The wire experiences a force / moves <u>downwards</u> ✓		**3.2a**

(b)

First check the answer on answer line **If answer = 1.1 (N) award 3 marks**	**3**	
(F = BIL) F = 0.30 x 5.0 x 0.75 ✓ F = 1.125 (N) ✓ F = 1.1 (N) 2 SF ✓		 **2.1** **2.1** **1.2**

4.

Question number	Answer	Additional guidance	Mark
(a)	at least four lines as shown (1) at least two arrows directed away from N poles (1)  	lines must not intersect (cross over) ignore continuation of lines to S of a magnet independent mark do not award if one or more arrows shown pointing towards N pole	**(2)** **AO1**

Question number	Answer	Additional guidance	Mark
(b)	any **three** from	marks can be awarded from a correctly labelled diagram	**(3)** **AO1**
	magnetic **fields** interact (1)	magnets are in each other's magnetic **field**	
	(force due to) repulsion (between magnets) (1)	repel / push away	
	(repulsion) force upwards (on upper magnet) (1)		
	weight / gravitational force (downwards on upper magnet) (1)	accept gravity (acts downwards)	
	forces equal size / in equilibrium (1)	forces are balanced	
		ignore references to charge	

Question number	Answer	Additional guidance	Mark
(c) (i)		independent marks	**(2)** **AO1**
	1 up(wards) (1)	accept out(wards from the magnet)	
	2 down(wards) (1)	accept in(wards) / into (magnet)	
		allow 1 mark for 1 down / in(wards) AND 2 up / out(wards)	

Question number	Answer	Additional guidance	Mark
(c) (ii)	substitution (1) 0.15 = 0.5(0) x 2.7 x L(ength) rearrangement and evaluation (1) (length =) 0.11 (m)	alternative method re-arrangement (1) (length =) $\frac{F}{B \times I}$ Or (length =) $\frac{0.15}{0.5(0) \times 2.7}$ (substitution and) evaluation (1) (length =) 0.11 (m) allow any values that round to 0.11 e.g 0.111 accept 0.1 or 0.$\dot{1}$ (m) allow 1 mark for answer of 9 (with or without working) award full marks for correct answer without working.	**(2)** **AO2**

5.

Answer given during the lesson.

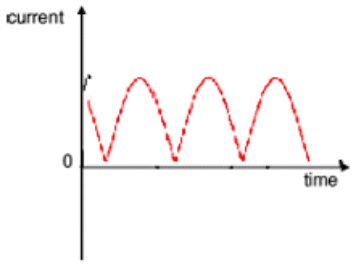
6.

Question Number:	Answer	Additional Guidance	Mark
(a)	a description to include:		**(3)** AO 1 2
	method of producing temporary induced magnetism (1)	place iron near / in contact with magnet / in magnetic field OR use magnet to pick up one paper clip OR use magnet to make iron a temporary magnet	
	method of demonstrating the magnetic properties of the temporary magnet (1)	paper clip(s) attracted to iron OR use first paper clip to pick up another paper clip	
	method of demonstrating magnetic effect is temporary (1)	remove magnet and paper clips no longer attracted / fall off OR wait some / short time and iron bar no longer picks up / attracts paper clips	

Question Number:	Answer	Additional Guidance	Mark
(b)(i)	a description to include 4 of the following:		**(4)** AO 2 2
	• note position of pointer before current is switched on (1)	measure length of spring before current is switched on	
	• measure position of pointer when current in coil (1)		
	• (use an ammeter to) measure current (1)		
	• calculate the extension / stretch of the spring (1)	how far nail moves	
	• use force (of attraction) is proportional to extension / stretch (of spring) (1)	calculate force from spring constant and extension calibrate spring	
	• repeat with different currents (1)	increase the current	
		calculate the extension of the spring using new position of pointer minus starting position of pointer is worth 3 marks	

Question Number:	Answer	Additional Guidance	Mark
(b)(ii)	select and substitute (1) (E =) ½ x 24 x 0.12^2 evaluation (1) (E =) 0.17 (J)	 ½ x 24 x 12^2 max 1 mark accept answers that round down to 0.17 e.g. 0.1728 POT error (e.g. 1728) max 1 mark award full marks for correct answer without working	**(2)** AO 2 1

7.

Question Number:	Answer	Mark
(a)	 B **The only correct answer is B** ***A*** *is incorrect because it shows an alternating current which is produced by an alternator and not by a dynamo* ***C*** *is incorrect because it shows a square waveform which is not produced by a dynamo* ***D*** *is incorrect because it shows current linearly increasing with time and this is not produced by a dynamo*	**(1)** AO 3 2b

Question Number:	Answer	Additional Guidance	Mark
(b)(i)	an explanation linking: (p.d. / current is only induced by a) changing magnetic field (1) a changing current (is needed to create a changing magnetic field) (1)	 alternating magnetic field the voltage/current (as shown) is not changing	**(2)** AO 1 1

Question Number:	Answer	Additional Guidance	Mark
(b)(ii)	substitution into $\frac{V_P}{V_s}=\frac{N_P}{N_s}$ (1) $\frac{25}{V_s}=\frac{30}{150}$ rearrangement (1) $V_s = \frac{25\times150}{30}$ evaluation (1) (V_s =) 130 (V)	substitution and rearrangement in either order $\frac{V_s}{25}=\frac{150}{30}$ allow 120 or 125 award full marks for correct answer without working	**(3)** AO 2 1

Question Number	Answer	Mark
(c)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1(6 marks) Understanding of physics • (long) transmission wires have resistance • reduced p.d. at the destination • (thermal) energy is dissipated in the transmission wires • this creates a power loss (refers to $P=I^2R$) • transformers are used to step up to a high voltage for transmission • this means a low current (refers to $V_PI_P=V_SI_S$) • so power loss is small(er) • transformers used to step down to a safer voltage for consumers • consumer wires are shorter and so power loss is less of an issue	**(6)** AO 1 1

8.

Question number	Answer	Additional guidance	Mark
(a) (i)	selection and substitution (1) (KE =) ½ x 1200 x 16(.0)^2 evaluation in kJ (1) (KE =) 150 (kJ)	(KE =) ½ x 1200 x 16(.0)^2 x 10^{-3} accept any value that rounds to 150 e.g. 153.6 award full marks for correct answer without working. award 1 mark for 153.6 or 150 to any other power of ten	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(a) (ii)	selection and substitution (1) $17.5 (\times 10^3) = \frac{126 (\times 10^6)}{t}$ re-arrangement and evaluation (1) (t=) 2(.0) (h)	alternative method selection and rearrangement (1) (t =) $\frac{\text{E(nergy)}}{\text{P(ower)}}$ or (t=) $\frac{126 (\times 10^6)}{17.5 (\times 10^3)}$ (substitution and) evaluation (1) (t=) 2(.0) (h) award full marks for correct answer without working. allow 1 mark for 7(.2) to any power of ten (incorrect time conversion) allow 1 mark for 2(.0) to any power of 10 (POT error)	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(a) (iii)	an explanation linking (energy transfers when the car is decelerating) (from) kinetic energy (store) (1) (to) chemical energy (store) (1)	 idea of energy that would be otherwise wasted uses an electrical pathway {electric current / electricity / emf} produced allow mechanical for kinetic in this context recharges battery increases available energy store of battery more useful energy available	**(2) AO2**

Question number	Answer	Additional guidance	Mark
(b) (i)	**either** calculation of time: substitution (1) (t =) $\frac{126\ (\times 10^6)}{15 \times 400\ (\times 3600)}$ evaluation (1) (t=) 5.8(3) (h)	accept correct time conversion e.g. 5h 50 min 350 min 21 000 s award 2 marks for correct answer without working. award 1 mark for answer of either 2.1 or 5.8(3) to any other power of ten	**(3)** **AO3**
	conclusion (1) claim is justified as the time is less (than 6 hours)	allow relevant comment based on incorrectly calculated time (independent mark)	
	or calculation of energy: substitution (1) $6\ (\times 3600) = \frac{E}{15 \times 400}$ rearrangement and evaluation (1) E = 130 MJ	accept 129.6 MJ accept 129 600 000 J	
	conclusion (1) claim is justified as energy (in 6 hours) is more than (126 MJ) required.	allow relevant comment based on incorrectly calculated energy (independent mark)	

Question number	Answer	Additional guidance	Mark
(b) (ii)	substitution (1) 126 (x 10^6) = Q x 400 re-arrangement and evaluation (1) (Q =) 315 000 (coulombs)	alternative method re-arrangement (1) (Q =) $\frac{E}{V}$ **or** (Q =) $\frac{126 (x 10^6)}{400}$ (substitution and) evaluation (1) (Q =) 315 000 (coulombs) accept answers rounding to 320 000 (coulombs) allow one mark for answers rounding to 3.2 to any other power of ten award two marks for correct answer without working.	**(2)** **AO2**

9.

(a)

Answers	Extra information	Mark
any **one** from: • too few turns / coils on the secondary • p.d. across the primary was reduced	allow number of turns / coils on the primary was increased ignore human error	1

(b)

the p.d. (across the secondary) goes above 2V	allow p.d. across secondary is higher than p.d. across primary after 20 turns	1

(c)

it increases (until the nails reach a constant temperature)		1

(d)

	an answer of 1.2 (A) scores **5** marks	
$\frac{640}{4} = \frac{V_p}{1.75}$		1
$V_p = \frac{640 \times 1.75}{4}$		1
$V_p = 280$ (V)		1
$280 \times I_p = 336$	allow their calculated $V_p \times I_p = 336$	1
$I_p = 1.2$ (A)	allow an answer that is consistent with their calculated value of V_p	1
or		
$336 = I_s \times 1.75$ (1)		
$I_s = \frac{336}{1.75}$ (1)		
$I_s = 192$ (A) (1)		
$I_p = 192 \times \frac{4}{640}$ (1)	allow I_p = their calculated $I_s \times \frac{4}{640}$	
$I_p = 1.2$ (A) (1)	allow an answer that is consistent with their calculated value of I_s	

10.

Answer given during the lesson.

11.

Answer given during the lesson.

12.

Question Number	Answer	Mark
(a)	D | vector | vector **is the only correct answer** ***A*** *'scalar scalar' is incorrect, both force and velocity are vectors* ***B*** *'scalar vector' is incorrect, with force being described incorrectly as a scalar* ***C*** *'vector scalar' is incorrect, with velocity being described incorrectly as a scalar*	**(1)** AO 1 1

Question Number	Answer	Additional guidance	Mark
(b)(i)	gravitational / centripetal (1)	accept gravity / weight/ gravitational field strength	**(1)** AO 2 1

Question Number	Answer	Additional guidance	Mark
(b)(ii)	arrow from the satellite towards the centre of Earth - by eye (1)	direction must be clear	**(1)** AO 2 1

Question Number	Answer	Additional guidance	Mark
(c)(i)	wavelength (of e.m. radiation) increased / frequency decreased (1) as the (star) moves away (from us) (1)	don't penalise planet instead of object stretched/moves to(wards) red end of spectrum spectral lines move to the red end of the spectrum	**(2)** AO 1 1

Question Number	Answer	Additional guidance	Mark
(c)(ii)	an explanation linking: • big bang has expanding universe (1) • with galaxies moving away (from each other) (1)	from (original) explosion started at a point accept stars moving away (not objects or planets now) the further away they are the greater is their (recessional) speed idea	(2) AO 1 1

Question Number	Answer	Additional guidance	Mark
(c)(iii)	microwave		(1) AO 1 1

Question Number	Answer	Additional guidance	Mark
(c)(iv)	(radiation) that comes from all over the sky / space / the universe	from the big bang / explosion	(1) AO 1 1

Question Number	Answer	Additional guidance	Mark
(c)(v)	an explanation linking: • the Big Bang theory has a beginning / initial explosion (1) • that releases/gives out radiation (1)	explosion from a point radiation still present	(2) AO 1 1

13.

	Answer	Additional guidance	Mark
(i)	gravitational attraction / gravitational force (causing collapse) (1)	allow gravity ignore weight ignore gpe ignore gravitational energy	(1) AO1

	Answer	Additional guidance	Mark
(ii)	An explanation linking: (gravity causing) increase in temperature (1) (until hot enough for) fusion (1) (until) balance (between gravity and fusion/thermal) (1)	 allow increase in pressure/density hydrogen to form helium allow nuclear reactions ignore fission allow equilibrium / counteracts	(3) AO1

14.

Answer	Mark
Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1** • neutrons released in a chain reaction • slow(er) neutrons needed for fission • (some) neutrons are too fast • control rods can be moved in and out • control rods control speed of the reaction **AO2** • graphite core is the moderator • graphite core slows down the neutrons • moveable rods absorb neutrons • moveable rods make more or fewer neutrons available for fission	**(6)** AO 1 1 AO 2 1

15.

Answer given during the lesson.

16.

Answer	Mark
Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1 (6 marks)** • momentum = mass × velocity • action and reaction are equal and opposite (N 3) • force of R on Q = -force of Q on R • $\frac{\text{change in momentum of Q}}{\text{time}} = \frac{\text{- change in momentum of R}}{\text{time}}$ • time of collision same for both • change in momentum of Q = - change in momentum of R • no overall change in momentum • R accelerates because of force from Q • transfer of momentum between Q and R	**(6)** AO 1 1

17.

Answer	Additional Guidance	Mark
recall clockwise moment = anticlockwise moment (1) moment = force x (perpendicular) distance (1) substitution (1) $m \times 17 = (6 \times 15) + (4.6 \times 10)$ rearrangement and evaluation (1) m = 8.0 (g)	calculations need not include g (which cancels out from all terms) substitution and rearrangement in either order $m \times 17 = 90+46$ $m = \frac{(6\times15)+(4.6\times10)}{17}$ $m = 136/ 17$ award full marks for correct answer without working	**(4)** AO 1 1 AO 2 1

18.

Answer given during the lesson.

19.

Answer	Additional Guidance	Mark
an explanation linking: use of $P = \frac{F}{A}$ (1)	accept answers in terms of work = force x distance accept reverse arguments	**(3)** AO 3 2a AO 3 2b
area of piston Y is less than area of piston Z (1) (therefore) force K is less than force L (1)	accept K for piston Y and L for piston Z	

20.

Answer given during the lesson.

21.

Answer given during the lesson.

22.

Question number	Answer	Additional guidance	Mark
(i)	(upthrusts in each case) are equal (1)		(1) AO3

Question number	Answer	Additional guidance	Mark
(ii)	an explanation linking any **three** of weight of ball = weight of water displaced (1) seawater more dense than fresh water (1) smaller volume of seawater (needs to be) displaced (1) to produce same weight of water (displaced) (1)	accept reverse arguments accept saltwater for seawater upthrust = weight of water displaced accept less seawater displaced to produce same upthrust	(3) AO1

23.

(a)

Answers	Extra information	Mark
arrow of equal size pointing vertically upwards	judged by eye ignore horizontal arrows if equal and opposite horizontal arrows of unequal length negates this mark	1
labelled 'upthrust'	ignore buoyancy ignore 25 kN	1

(b)

	an answer of 2600 scores **4** marks	
weight = 25 kN	allow 24 to 25 kN inclusive	1
25 000 = mass x 9.8 **or** $m = \frac{25\,000}{9.8}$	allow their W correctly converted and substituted	1
m = 2551 kg	allow correctly calculated value using their converted W allow a value correctly calculated with W in kN	1
m = 2600 kg	allow a calculated answer correctly rounded to 2 significant figures	1

(c)

Newton's 3rd law (of motion)		1

(d)

vertical force (50 N) drawn **and** horizontal force (150 N) drawn to the same scale		1
resultant tension force in the correct direction	shown by an arrowhead	1
value of the tension force in the range 156 N–160 N	allow a calculated value of 158	1
value of direction in the range 18°–20° (from the horizontal)	allow 70° to 72° (from the vertical) allow a bearing in the range 288 to 290	1