



Pearson Edexcel GCE Physics

Additional Support Worksheets: Answers

Contents

Answers 1

Question Number	Answer	Mark
1	<p>The only correct answer is B</p> <p>A is not correct because this ignores the - sign C is not correct because there is now force acting upwards D is not correct because there is no force acting downwards</p>	1
2	<p>The only correct answer is B ($-4.0 \times 10^{-3} \text{ N}$)</p> $E = \frac{F}{Q} = \frac{8.0 \times 10^{-3} \text{ N}}{4.0 \times 10^{-6} \text{ C}} = 2.0 \times 10^3 \text{ N C}^{-1}$ <p>For $-2.0 \times 10^{-6} \text{ C}$</p> $F = EQ = (2.0 \times 10^3 \text{ N C}^{-1}) \times (-2.0 \times 10^{-6} \text{ C}) = -4.0 \times 10^{-3} \text{ N}$ <p>A is not correct because this would be the current is a series circuit C is not correct because this used original force without adjusting for smaller charge D is not correct because charge not halved</p>	1
3	<p>The only correct answer is A (0.25 N)</p> <p>Doubling separation makes the force $\frac{1}{4}$ times smaller due to inverse square law.</p> <p>B is not correct because this is inverse force C is not correct because this assumes force is proportional to separation D is not correct because this assumes force is proportional to separation squared</p>	1
4	<p>The only correct answer is A ($1.35 \times 10^{-7} \text{ C}$)</p> $Q = \frac{Er^2}{k} = \frac{4500 \text{ N C}^{-1} \times (0.30 \text{ m})^2}{9.0 \times 10^9} = 1.35 \times 10^{-7} \text{ C}$ <p>B is not correct because r is not squared C is not correct because 30 cm used instead of 0.3 m D is not correct because equation incorrectly rearranged</p>	1
5	<p>The only correct answer is C (The electric field strength is equal to the negative rate of change of electric potential with distance)</p> <p>A is not correct because electric field and electric potential are not the same B is not correct because sign is incorrect D is not correct because not a square law</p>	1
6	<p>The only correct answer is C</p> $E = \frac{V}{D} \text{ so } E_1 = \frac{500 \text{ V}}{0.1 \text{ m}} = 5000 \text{ Vm}^{-1} \text{ and so } E_2 = \frac{500 \text{ V}}{0.05 \text{ m}} = 10000 \text{ Vm}^{-1}$ $\frac{E_2}{E_1} = \frac{10000}{5000} = 2$	1

7	<p>The only correct answer is C</p> <p>A is not correct because $V \propto \frac{1}{r}$ B is not correct because $V \propto \frac{1}{r}$ D is not correct because $V \propto \frac{1}{r}$</p>	1
8	<p>The only correct answer is C (0.50 as $C = Q/V$)</p> <p>A is not correct because this is V/Q with units converted B is not correct because this is $\frac{1}{2} Q/V$ D is not correct because this is V/Q with units not converted</p>	1
9	<p>The only correct answer is C (0.08)</p> <p>A is not correct because $W = \frac{1}{2} CV^2$ and this is $\frac{1}{2} CV$ C is not correct because $W = \frac{1}{2} CV^2$ and this is CV D is not correct because $W = \frac{1}{2} CV^2$ and this is CV^2</p>	1
10	<p>The only correct answer is C (22)</p> <p>$\tau = RC = (10 \times 10^3)\Omega \times (2200 \times 10^{-6}) F$</p>	1
11	<p>The only correct answer is C (5.00×10^{-2})</p> <p>flux linkage = number of turns X magnetic flux = $200 \times 2.5 \times 10^{-4} Wb$</p>	1
12	<p>The only correct answer is B (0.10)</p> <p>$\Phi = B \cdot A \cdot \cos\theta = 0.5 T \times 0.02 m^2 \times 1 \times 10 = 0.10 Wb$</p>	1
13	<p>The only correct answer is D (Z)</p> <ul style="list-style-type: none"> Fleming's left-hand rule: Thumb = force, First finger = magnetic field, Second finger = current (or velocity of positive charge). For an electron (negative), the force is opposite to the direction given by the left-hand rule for a positive charge. Field: into the page, velocity: right \rightarrow force is upwards for an electron. 	1
14	<p>The only correct answer is B (Increasing the speed of relative motion between the coil and the magnet)</p> <p>Faraday's law states that $\mathcal{E} = -N \frac{\Delta\Phi}{\Delta t}$. Increasing the relative speed increases the rate of change of magnetic flux ($\Delta\Phi/\Delta t$), increasing the induced e.m.f.</p>	1
15	<p>The only correct answer is C (Increasing how quickly the current in the primary coil changes)</p> <p>Faraday's law states that the induced e.m.f. depends on the rate of change of magnetic flux. A faster change of current in the primary coil produces a faster-changing magnetic field, which increases the e.m.f. in the secondary coil</p>	1

16	<p>The only correct answer is A</p> $R_1 = \frac{mv}{BQ} \quad R_2 = \frac{m(v/2)}{4BQ} = \frac{mv}{8BQ} = \frac{R_1}{8}$	1
17	<p>The only correct answer is A ($V = 9e^{-1 \times 10^{-3}/(500 \times 4 \times 10^{-6})}$)</p> <ul style="list-style-type: none"> • Voltage in discharge: $V = V_0 e^{-t/RC}$ • $RC = 500 \times 4 \times 10^{-6} = 0.002$ s • Substitute $t = 1$ ms correctly into $e^{-t/RC}$ 	1
18	<p>The only correct answer is B (2.47 A)</p> <p>RMS current: $I_{\text{rms}} = \frac{I_0}{\sqrt{2}} = \frac{3.5}{1.414} \approx 2.47$ A</p>	1
19	<p>The only correct answer is C</p> $E = \frac{1}{2} CV^2 \text{ so } C = \frac{2E}{V^2} = \frac{16}{16} = 1 \text{ F}$ <p>When p.d. = 8 V $E = \frac{64}{2} = 32$ J</p>	1
20	<p>The only correct answer is A</p> <p>B is not correct because this is equivalent to a coulomb C is not correct because this is equivalent to a farad⁻¹ D is not correct because this is equivalent to a watt⁻¹</p>	1