Magnetism and Electromagnetism

Past Paper Answers AQA Physics GCSE

Question	Answers	Extra information	Mark
1	motor (effect)		1
2	current creates a magnetic field (around the coil)		1
	(which) interacts with the permanent magnet field		1
	producing a (resultant) force causing the coil/cone to move		1
	(when the) direction of the current reverses, the direction of the (resultant) force reverses (producing a sound wave)	allow coil/cone for force allow backwards for reverses	1
3	the student changed two variables at the same time	allow only one variable should be changed at a time	1
	(so) it is not possible to know the effect of each variable		1

4	hold thumb first finger and second finger (of left hand) at right angles to each other	allow first two fingers/index and middle for first and second finger throughout	1
	second finger represents the current pointing out of the paper		1
	first finger represents the field pointing downwards		1
	thumb points in the direction of the force / thrust / acceleration		1
	(therefore) the rod moves left to right	allow correct description (eg away from the magnet) dependent on scoring marking point 3 or 4	1

5	decrease the resistance of the variable resistor	allow increase the current/pd	1
	use a stronger magnet	allow use a magnet with a greater flux density	1

6	$F = 0.30 \times 1.7 \times 0.050$		1
	$F = 0.0255$ (N)		1
	$m = 0.004(0$ kg)		1
	$0.0255 = 0.0040 \times a$	this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated	1
	$a = 0.0255 / 0.0040$ or $a = 6.375$	this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated	1
	$\Delta v = 6.375 \times 0.15 = 0.95625$ (m/s)	allow a correct calculation using an incorrectly / not converted m and / or an incorrectly calculated F allow 0.96 or 0.956 (m/s)	1
	alternative method		
	$F = 0.30 \times 1.7 \times 0.050$ (1)		
	$F = 0.0255$ (N) (1)		
	$m = 0.004(0$ kg) (1)		
	$0.0255 = \dfrac{0.0040 \times \Delta v}{0.15}$ (1)	this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated	
	$\Delta v = \dfrac{0.0255 \times 0.15}{0.0040}$ (1)	this mark may be awarded if m is incorrectly / not converted and / or F is incorrectly calculated	
	$\Delta v = 0.95625$ (m/s) (1)	allow a correct calculation using an incorrectly / not converted m and / or an incorrectly calculated F allow 0.96 or 0.956 (m/s)	