Name of the Student:_____
Max. Marks : 11 Marks **Time : 11 Minutes**

Mark Schemes

Q1.

Question Number	Acceptable Answer	Additional Guidance	Mark
(i)	• Electric field vertically downwards (from top plate to bottom plate) (1) • Magnetic field into paper (1)		2

Question Number	Acceptable Answer	Additional Guidance	Mark
(ii)	• Use of $E = \frac{V}{d}$ (1) • Use of $F_E = EQ$ (1) • Use of $F_M = BQv$ (1) • Show that these forces are equal (if v is 2.2×10^5 m s^{-1}) and hence state that B is suitable (1)	Do not award MP4 if incorrect ion charge used Example of calculation: $E = \frac{V}{d} = \frac{135\text{ V}}{2.5\times10^{-2}\text{ m}} = 5400\text{ V m}^{-1}$ $F = EQ = 5400\text{ V m}^{-1} \times 1.6\times10^{-19}\text{ C} = 8.6\times10^{-16}\text{ N}$ $F = BQv = 24.5\times10^{-3}\text{ T} \times 1.6\times10^{-19}\text{ C} \times 2.2\times10^{5}\text{ m s}^{-1}$ $= 8.6\times10^{-16}\text{ N}$	4

Q2.

Question Number	Acceptable Answer	Additional guidance	Mark
	A	F/2	**(1)**

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Q3.

Question Number	Acceptable answers	Additional guidance		Mark
	B The induced emf in the coil will oppose the cell emf and cause a delay in the current to lamp Y	Lights after a delay with a final brightness the same as X		1
	A assumes the resistance of the coil is more than the resistor C ignores the magnetic effect of the coil and assumes the resistance of the coil is more than the resistor D ignores the magnetic effect of the coil			

Q4.

Question Number	Acceptable answers	Additional guidance	Mark
	The only correct answer is B A *is not correct because it is 3 divided by 2* C *is not correct because it is 3 x root 2* D *is not correct because it is* 3^2	2.1 A	1

Q5.

Question Number	Acceptable answers	Additional guidance	Mark
	Direction out of page (1)	The arrow needs to be parallel to the length of the pipe by eye.	1

Q6.

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Question Number	Answer	Mark
	A	1

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