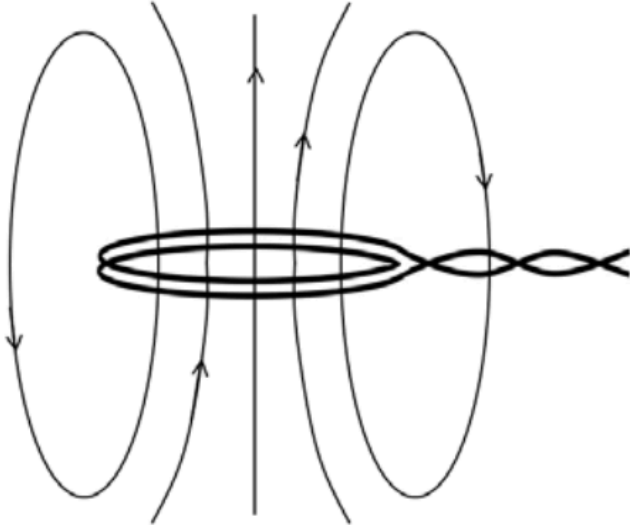


Question number	Answer	Notes	Marks
3 (a)	MP1. at least one straight, vertical central field line; MP2. any field line drawn circling the wire / at least one peripheral field loop; MP3. field directions correct and consistent throughout and shown on at least two lines; 	ignore breaking of field lines as they pass through the centre of the coil by eye condone spiral drawn round wire	3

(b)	any 3 from: MP1. idea of magnetic fields interacting; MP2. idea of (magnetic) attraction or repulsion; MP3. reversing current reverses direction of magnetic field / force; MP4. some comparison with magnets, e.g. like poles repel, unlike poles attract;	allow field lines crossing ignore 'cutting' reject mention of electrostatic force or charge mention of having 'poles'	3
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Total 6 marks

Question number	Answer	Notes	Marks
4 (a)	Rods magnetised; And repel;	Reject ideas of charge for one mark only	2
(b)	MP1. A named magnetic material e.g.(soft) iron; MP2. because the material is capable of being magnetised; MP3. DOP (iron only) but does not retain its magnetism;	ACCEPT steel, mu-metal, nickel, cobalt accept RA steel would stay magnetised/apart	3
(c)	any two from- MP1. field (in coil) switches polarity; MP2. field (in rods) weaker; MP3. (since) field alternates with current or at 50 Hz; MP4. rods may not have time to become fully magnetised;	allow • 100 times a second or mains frequency • hysteresis ideas • domain theory • reluctance ideas	2

Total 7 marks

Question number	Answer	Notes	Marks
1 (a)	any four from: MP1. there is a current in the rod; MP2. (therefore) magnetic field around rod; MP3. magnetic fields interact / overlap; MP4. producing a force (on the rod); MP5. catapult effect / motor effect / LH rule; MP6. rod moves to the right / towards the power supply;	allow 'AB' for rod throughout allow current in the rail ignore references to cutting field lines accept the rod moves sideways / left	4
(b)	any four from: MP1. alternating current changes direction (continuously); MP2. current in coil produces alternating magnetic field/eq; MP3. (producing) force on the coil/cone; MP4. reversing direction of current reverses direction of the force; MP5. hence coil/cone vibrates; MP6. cone vibrates air particles;	allow any marking point if clear from diagram allow changing magnetic field allow coil / cone moves in and out / backwards and forwards total marks = 8	4