

Magnetism

Mark Scheme 2

Level	IGCSE(9-1)
Subject	Physics
Exam Board	Edexcel IGCSE
Module	Single Award (Paper 2P)
Topic	Magnetism and Electromagnetism
Sub-Topic	Magnetism
Booklet	Mark Scheme 2

Time Allowed: 33 minutes

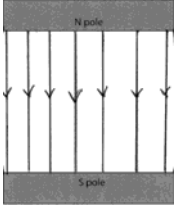
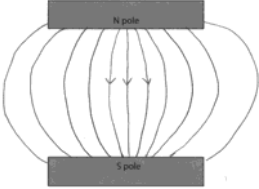
Score: /27

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	775%	70%	60%	55%	50%	<50%

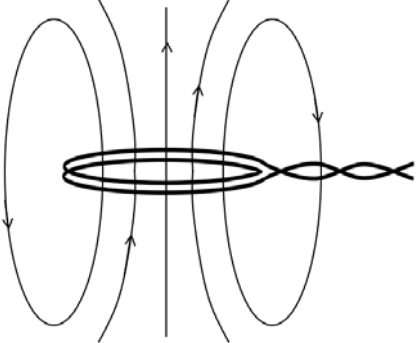
Question number	Answer	Notes	Marks
1 (a) (i)	arrows on two or more { lines from N to S and/or clockwise on loops around wire};	accept arrows beside lines showing correct directions reject contradicting arrows (i.e. one correct and one incorrect)	1
	(ii) horizontal arrow (by eye); pointing to the left;	accept <ul style="list-style-type: none">• arrow not passing through wire• unlabelled arrow if clear DOP	2

<p>(b)</p>	<p>EITHER:</p> <p>Uniform field drawn MP1. single straight line drawn perpendicular to and between poles; MP2. additional straight lines drawn either side that are parallel and evenly spaced (by eye);</p> <p>OR</p> <p>Non-uniform field drawn MP1. central straight line(s) drawn perpendicular to and between poles; MP2. correctly curved lines drawn either side of the centre and drawn symmetrically (by eye);</p>	<p>Lines can start/end at faces or edges of poles</p>   <p>ignore all arrows on lines</p>	<p>2</p>
------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------

(c)	MP1. place compass around magnet and note / mark its direction; MP2. place compass in new position and note / mark its direction again; MP3. directions linked together to find a field line / pattern;	ignore references to iron filings award marks if clear in diagram if contradiction between words and diagram, go by the diagram allow use of additional compass(es)	3
-----	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---

Total 8 marks

Question number		Answer	Notes	Marks
2	a	<p>one of: iron is (soft) magnetic; iron loses its magnetism easily;</p>	allow RA for steel	1
	b	<p>these can be shown on a labelled diagram</p> <p>MP1. current carrying (insulated) wire;</p> <p>MP2. wrapped into coil;</p> <p>MP3. wrapped on iron core;</p>	<p>allow</p> <p>wire shown connected to a battery solenoid = MP2 only</p>	3
	c	<p>Any two ideas from:</p> <p>MP1. current/ voltage reduces OR eq;</p> <p>MP2. magnetic field of em reduces;</p> <p>MP3. (magnetic) force holding the iron plate to the magnet no longer present;</p>	<p>do not give marks for</p> <ul style="list-style-type: none"> • 'the door closes'/eq • electricity • power <p>allow current stops circuit broken</p> <ul style="list-style-type: none"> • iron plate no longer magnetised 	2
			total = 6 marks	

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

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 <ul style="list-style-type: none"> • 100 times a second or mains frequency • hysteresis ideas • domain theory • reluctance ideas 	2

Total 7 marks