Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

(a) both arrows pointing horizontally and to the right
judged by eye
1

(b) (two south) poles would repel
allow magnets would repel
1

so the coat would not be held together
allow so the coat would not fasten
1

(c) C
1

(d) steel rod
1

(e) electromagnet exerts a downwards force on the iron bar
allow electromagnet pulls the iron (bar) down(wards)
allow electromagnet attracts the iron (bar)
1

(f) 1.5 (cm)
1

(g)
*an answer 0.27 (N) scores **2** marks*

F = 0.18 × 1.5
OR
F = 0.18 × their 3.6
1

F = 0.27 (N)
allow 0.18 × their 3.6 correctly calculated
1

(h) it increases
1

and reaches a maximum
allow and then does not change
any change other than current causing strength to increase

*scores **0***

1

[11]

Q2.

(a) top of each paper clip labelled N / north

both parts required

and

bottom of each paper clip labelled S / south

1

(b) so the paper clips have the same weight / mass

1

which allows the results for different numbers of turns to be compared (fairly)

allow <u>fair test</u>
allow the control variable (is the weight / mass of a paper clip)
allow to obtain valid results
ignore accurate results

1

(c) as the number of turns increases so does the number of paper clips (held)

allow positive correlation

1

in a linear pattern

*directly proportional scores **2** marks*
*allow a correct description of directly proportional for **2** marks*

1

(d) some of the paper clips were already magnetised

1

(e) discount the result of 18

ignore repeat experiment / measurements

1

as the three new results are similar (and not close to 18)

1

and use 15 (the mean of the new results)

allow find the mean of the remaining results (16,14 and 15)

if no other marks have been awarded: calculate the mean (of all four results) (1)

round down to 15 (1) − this mark only scores if the mean of 15.75 has been calculated

1

(f) keep number of turns constant

allow a specific number of turns

1

(use the variable resistor to) change the current (several times)

change the p.d. is insufficient

1

(for each current value) count how many paper clips the electromagnet will hold

1

[12]