

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

(a) iron and steel will be attracted (to the magnet) 1

aluminium, copper and tin will not be attracted (to the magnet)

allow 1 mark if one metal is in the incorrect list, but all the other four are correct

if no other mark awarded allow iron and steel are magnetic for 1 mark

1

(b) the paperclip would still be attracted to the magnet 1

because of induced magnetism

allow the paper clip becomes an induced magnet

allow because the paper clip is a temporary magnet

allow there is a magnetic field at the south pole

1

(c) weight = mass × gravitational field strength

or

$$W = mg$$

do not accept gravity for gravitational field strength

1

(d) 1.0 g = 0.0010 kg 1
allow 0.001 (kg)

$$\text{weight of 1 paperclip} = 0.0010 \times 9.8$$

allow 0.0098 (N)

allow correct substitution using incorrectly/not converted value of mass of paperclip

1

$$\text{Force} = 0.0098 \times 20 = 0.196 \text{ (N)}$$

allow correct calculation using incorrectly/not converted value of mass of paperclip

1

[8]

Q2.

- (a) **Level 3:** The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced. 5-6
- Level 2:** The method would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced. 3-4
- Level 1:** The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear. 1-2
- No relevant content** 0
- Indicative content**
- measurements**
- place one wooden block under the ramp
 - vary the height by placing a different number of wooden blocks
 - measure the height of the ramp using a metre rule
 - measure the distance travelled using a metre rule
 - measure time taken using light gates (and computer/datalogger)
 - measure time taken using a stopclock or ticker timer
 - release trolley from the same position each time
 - release the trolley without applying a force
- results**
- repeat at the same height and calculate a mean
 - repeat for different heights
 - calculate acceleration using $a = (v-u)/t$ or $a = \frac{v^2 - u^2}{2s}$
- (b) all points plotted correctly 2
allow 1 mark for 3 points plotted correctly
- height of ramp in metres on x-axis **and** acceleration in m/s^2 on y-axis) 1
both quantity and unit required for both axes
- correct line of best fit 1
- (c) resultant force = mass \times acceleration 1
or
 $F = ma$
- (d) $0.63 = m \times 2.1$ 1
 $m = \frac{0.63}{2.1}$ 1

$m = 0.30 \text{ (kg)}$
allow 0.3 (kg)

1
[14]