

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

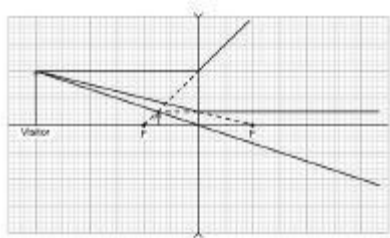
Mark Schemes

Q1.

- (a) any **two** correct lines drawn from the top of the visitor and passing through the lens
allow construction lines that are not dashed

2

image drawn at the correct position and with the correct orientation
mark only scores if first two marks scored.
a convex lens diagram scores 0 marks



1

- (b) Decreases

1

- (c) Iron

1

- (d) there is a current in the solenoid / circuit
allow a charge flows through the solenoid / circuit

1

creating a magnetic field
allow the solenoid / coil is magnetised

1

attracting the bolt

1

- (e) $1.50 \text{ cm} = 0.015 \text{ m}$

1

$2.88 = k \times 0.015$
this mark may be awarded if distance is incorrectly/not converted

1

$k = 2.88 / 0.015$
this mark may be awarded if distance is incorrectly/not converted

1

$$k = 192 \text{ (N/m)}$$

allow a correctly calculated answer using an incorrectly/not converted distance

1

(f) Any **two** from:

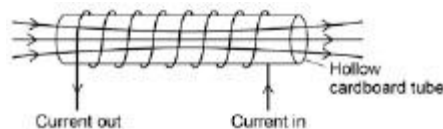
- increase the current (in the solenoid / circuit)
*allow any sensible suggestion for increasing the current such as increasing the p.d. / power of the battery **OR** using lower resistance wire in the solenoid*
- add more turns to the solenoid
*do **not** allow increase the number of coils*
- use a spring with a lower spring constant
allow use a weaker spring

2

[14]

Q2.

(a) field lines going in, (through) and out of the solenoid



*allow field lines only visible outside the cardboard tube
allow a bar magnet shaped field with lines above and below the solenoid*

1

arrow(s) in correct direction

1

(b) the rods become (induced) magnets

*allow the rods are (temporarily) magnetised
ignore rods repel
do **not** accept rods become charged*

1

with the same polarity (at each end)

1

(c) changed two (independent) variables (at the same time)

*allow need to keep current or number of turns constant
allow should only change one variable (at a time)
allow current and number of turns both changed
ignore fair test*

1

so it is not possible to know the effect of one (independent) variable or the other

1

(d) (increasing the current) increases the strength until the strength reaches a maximum value

*allow weight (held) for strength of electromagnet
ignore a given current value for when maximum strength happens*

- (e) increasing the number of turns from 10 to 20 increases the strength more than increasing from 20 to 30

a general trend is required