



PEAK SUCCESS EDUCATION

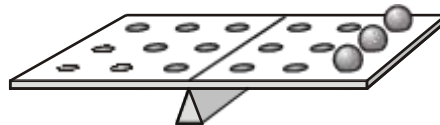
Kenya Certificate of Secondary Education

MARKING SCHEME

1. (a) • it will go down 1

*accept 'it will tip anticlockwise'*  
*accept 'it will tip towards A'*  
*accept 'end B will go up'*  
*'tip' is insufficient*

(b) • 1



*all three balls are required for the mark*  
*ignore any shading and size*

(c) • 100 1

(d) (i) • carbon ✓ 1 (L4)  
*if more than one box is ticked, award no mark*

(ii) any **one** from 1

- steel contains iron
- brass does not contain iron
- iron is magnetic **or** sticks to a magnet
- copper and zinc are not magnetic **or** will not stick to a magnet

*accept 'steel contains iron and carbon'*  
*the answer must relate to the elements*

*'steel is magnetic' is insufficient*  
*'copper is not magnetic' is insufficient*  
*'zinc is not magnetic' is insufficient*

*'brass is not magnetic' is insufficient*  
*'copper and zinc are not magnets' is insufficient*

[5]

2. (a) • both picked up the same number **or** four paper-clips 1
- accept 'they both picked up the same number'*  
*accept 'same amount of paper-clips'*  
*accept 'there were 5 out of 9 paper-clips left for both'*  
*accept 'the same mass of paper-clips'*  
*'they hold the same clips' is insufficient*
- (b) any **one** from 1
- it does not stay magnetised
  - it can be turned off
- accept 'you cannot turn steel off'*
- objects do not stay attached to it
  - iron loses its magnetism
  - steel stays magnetised
- (c) (i) any **one** from 1 (L6)
- the greater the distance the lower the reading
  - the further away the smaller the reading
- accept the converse*  
*accept 'at big distance the field is weaker' or the converse*  
*accept 'at 50 mm the reading is lower'*  
*accept the converse*  
*do **not** accept 'the bigger the distance the smaller the amps **or** current'*
- (ii) • the greater the current the stronger the electromagnet 1

- (iii) any **one** from 1
- change the number of turns
  - change the thickness of the wire
  - change the diameter of the core

*accept 'use more coils'*

*accept 'use fewer or less coils'*

*accept 'put the coils closer together' or the converse*

*accept 'change the metal of the coils'*

*accept 'use a different sized core'*

*accept 'use nickel or cobalt core'*

*accept 'use a different core'*

*'use bigger coils' is insufficient*

*'use more wire' is insufficient*

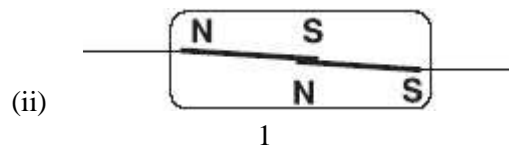
*do not accept 'add more batteries'*

[5]

3. (a) (i) • add more coils **or** turns 1
- accept 'put coils or turns closer together'*
- do not accept 'move it closer'*
- increase the current 1

*accept 'increase the number of cells or batteries'*

*accept 'increase the voltage or power'*



*all four poles must be correct for the mark*

- (b) (i) any **one** from 1 (L7)
- steel stays magnetised
  - iron loses its magnetism
  - the switch would stay closed
  - the switch would not spring open

- (ii) · copper is a better conductor than iron 1  
*accept the converse*  
*accept 'copper has a lower resistance'*  
*accept 'iron **or** the reed switch has a greater resistance'*

[5]

4. (a) they will repel **or** it will push the magnet away **or** it will push the coil 1  
*accept 'it will change the direction of the force'*  
*accept 'it will make the magnet twist around and attract'*  
*do **not** accept 'the magnet moves away'*

- (b) (i) any **one** from 1

- because the magnet is heavier **or** the paper clip is lighter  
*accept 'because the magnet is heavy'*
- so the moments are equal

- (ii) current in the coil produces a magnetic field 1  
*accept 'the coil becomes an electromagnet'*  
***or** 'the coil is magnetised'*

- the magnet is attracted **or** repelled 1  
*accept 'the field **or** coil exerts a force on the magnet'*

- (iii) any **one** from 1

- the straw is deflected more **or** moves more
- the reading is higher **or** goes up

- any **one** from 1

- it increases the magnetic field
- it makes the electromagnet stronger
- it attracts **or** repels the magnet more strongly

[6]

5. (a) any **two** from 2

- ✓ on each side of the pivot, the like poles repel  
*accept 'like poles repel' or 'N repels N and S repels S'*  
*do not accept 'the poles of the magnet repel' or 'opposites attract'*
- ✓ on each magnet the two poles are of equal strength
- ✓ if the N pole is tipped downwards, the N poles repel more strongly
- ✓ if the S pole is tipped down, the S poles repel more strongly
- ✓ the two poles which are closest together repel more strongly
- ✓ the moments are balanced **or** the forces are equal when the bar magnet is horizontal  
*accept 'the forces balance when the bar is level'*

(b) (i) any **one** from 1

- ✓ the right hand end will tip down  
*only accept 'it will tip' if the correct direction is indicated*
- ✓ the left hand end will tip up
- ✓ the S pole will move down
- ✓ the N pole will move up

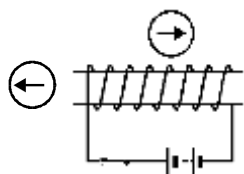
any **two** from 2

- ✓ the coil weakens the S pole of the horseshoe magnet  
*accept 'the S pole of the horseshoe magnet becomes an N pole' or 'the S pole is cancelled out'*
- ✓ the repulsion between the S poles is weaker  
*accept 'the S pole of the bar magnet is now attracted'*
- ✓ the coil strengthens the N pole of the horseshoe magnet  
*accept 'the coil reinforces the N pole' or 'the N pole becomes stronger'*
- ✓ the repulsion between the N poles is stronger

- (ii) it tips the other way **or** the N pole tilts down 1  
*do not accept 'the opposite will happen'*
- (iii) it rocks 1  
*accept 'it would vibrate' or 'it would oscillate' or 'it would move back and forth'*  
*accept 'the N or S pole goes up and down'*  
*do not accept 'it goes up and down'*

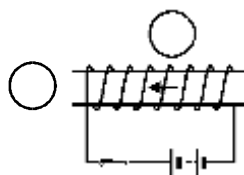
[7]

6. (a) (i) 2



*award one mark for each correctly drawn arrow*  
*the arrows must be drawn in the compasses*

- (ii)  
1



*the arrow must be drawn in the tube*

- (iii) North 1

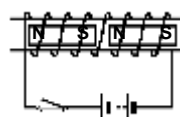
*do not accept 'the same direction'*

- (b) any **one** from 1

- ✓ reverse the battery
- ✓ wind the coil in the other direction

*accept 'connect the battery the other way round' or 'change the direction of the flow of electricity' accept 'reverse the coil'*  
*do not accept 'turn the glass tube around'*

- (c) (i) 1



*all four poles are required for the mark*

(ii) they attract each other

1

*accept 'they attract' or 'unlike poles attract'  
do **not** accept 'they are magnetised'*

[7]