

Mark schemes

1

- (a) (i) copper **or** steel

*accept 'iron' **or** 'brass' **or** 'aluminium' **or** 'metal'*
*do **not** accept 'a conductor'*

1

- (ii) wood **or** plastic **or** rubber

accept any named insulator
*do **not** accept 'an insulator' **or** 'not a conductor'*

1

- (b) the circuit is completed **or** there is a complete circuit

accept 'it makes a circuit'
accept 'electricity can flow'
*do **not** accept 'because there is a contact'*

1

- (c) paint is an insulator **or** paint does not conduct electricity

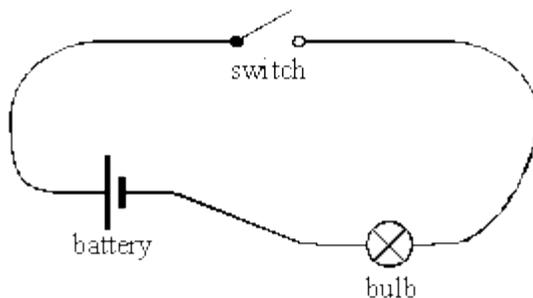
accept 'paint is not a conductor'
***or** 'electricity cannot go through paint'*
accept 'it is not a complete circuit'
*do **not** accept 'the paint is in the way'*

1

[4]

2

- (a) three wires are drawn:



all three wires are required for the mark **all three** components must be correctly connected for the mark
accept a correct circuit diagram in which the pupil has drawn the symbols instead of connecting the printed symbols

1 (L3)

- (b) It is the same brightness. ✓

if more than one box is ticked, award no mark

1 (L3)

(c)

position of switch 1	position of switch 2	is the bulb on or off?
<i>B</i>	<i>D</i>	<i>on</i>
<i>A</i>	<i>D</i>	<i>off</i>
<i>A</i>	<i>C</i>	<i>on</i>

both answers are required for the mark

1 (L4)

(d) (i) neither **or** none

accept 'nothing' or 'it works'

1 (L4)

(ii) it stays on

accept 'it gets brighter'

1 (L4)

[5]

3

switch A	switch B	Which lamp, if any, is it?	In which direction, if any, does the motor turn?	
<i>up</i>	<i>down</i>	lamp 1	<i>forwards</i>	
<i>up</i>	<i>up</i>	neither or none	not turning or none or off	<i>both answers are required for the mark do not accept blank boxes or dashes</i>
<i>down</i>	<i>up</i>	lamp 2	backwards	<i>award one mark for each correct answer</i>
<i>down</i>	<i>down</i>	neither or none	not turning or none or off	<i>both answers are required for the mark do not accept blank boxes or dashes</i>

1

2

1

(L5)

[4]

- 4 (a) bulb X
do not accept 'both bulbs' or 'bulb X and bulb Y' 1 (L5)
- (b) neither **or** no bulb **or** none 1 (L5)
- (c) (i) goes out 1 (L5)
- (ii) gets brighter 1 (L5)
- (d) (i) gets brighter 1 (L5)
- (ii) goes out 1 (L5)

[6]

- 5 (a) the motor runs backwards
accept 'the crane lowers the load'
or *'the crane drops the load'*
or *'the load goes in the other direction'* 1
- (b) any **one** from
 - it will not run
accept 'nothing'
 - it will stop 1
- (c) any **one** from
 - it shorts out the batteries or cells
accept 'it is a short circuit'
 - the batteries or cells or wires will get hot
 - the batteries or cells will go flat quickly
accept 'the battery or wires will burn out' 1
- (d) (i) no difference **or** none
accept 'the crane lifts the load'
or *'the resistor will not do anything'* 1

- (ii) any **one** from
- the motor turns more slowly
accept 'it will stop the motor working'
 - it lowers the load more slowly
 - there is a smaller current
accept 'it moves the load more slowly'
accept 'it gives it less power'
or 'it will slow down the flow of electrons'

1

[5]

6

- (a) switches 1 and 2
if more than one box is ticked, award no mark

1 (L5)

- (b) no because switch 1 must be on **or** closed
both the answer and the reason are required for the mark
accept 'there is no switch in the motor section of the parallel circuit, so it cannot be isolated'

1 (L5)

- (c) it would go up
accept 'it would get hotter or very hot'
do not accept 'it would be hot'

1 (L5)

- (d) any **one** from
- no effect
accept 'the motor speeds up slightly'
 - it would stay on

1 (L5)

[4]