# Current Potential Diff and Resistance

## Mark Scheme 1

| | |
|---|---|
| **Level** | GCSE (9-1) |
| **Subject** | Combined Science: Trilogy - Physics |
| **Exam Board** | AQA |
| **Topic** | 6.2 Electricity |
| **Sub-Topic** | Current Potential Diff and Resistance |
| **Difficulty Level** | Bronze Level |
| **Booklet** | Mark Scheme 1 |

**Time Allowed:** **56 minutes**

**Score:** **/56**

**Percentage:** **/100**

**Grade Boundaries:**

**M1.**(a) (i) any **six** from:

- switch on
- read both ammeter and voltmeter
  *allow read the meters*
- adjust variable resistor to change the current
- take further readings
- draw graph
- (of) V against I
  *allow take mean*
- R = V / I
  *allow take the gradient of the graph*

**6**

(ii) resistor would get hot if current left on

**1**

so its resistance would increase

**1**

(iii) 12 (V)
*0.75 × 16 gains **1** mark*

**2**

(iv) 15 (Ω)

**1**

16 is nearer to that value than any other

**1**

(b) if current is above 5 A / value of fuse

**1**

fuse melts

*allow blows / breaks*
*do **not** accept exploded*

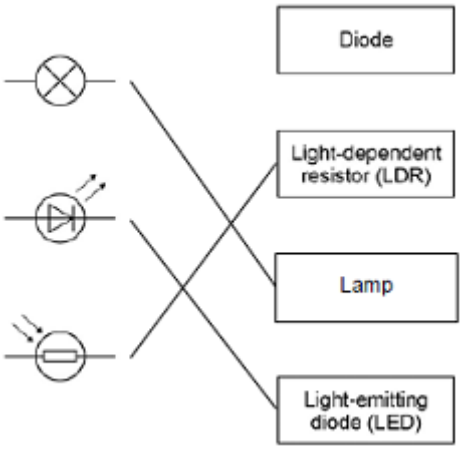
**1**

breaks circuit

**1**

**[15]**

**M2.**(a)




*allow **1** mark for each correct line if more than one line is drawn from any symbol then all of those lines are wrong*

**3**

(b) (i) half

**1**

(ii) 3(V)

**1**

(iii) $V_1$

**1**

(c) (i) potential difference / voltage of the power supply
*accept the power supply*
*accept the voltage / volts*
*accept number of cells / batteries*
*accept (same) cells / batteries*
*do not accept same ammeter / switch / wires*

**1**

(ii) bar drawn – height 1.(00)A
*ignore width of bar*
*allow **1** mark for bar shorter than 3rd bar*

**2**

(iii) as the number of resistors increases the current decreases

**1**

**[10]**

**M3.**(a) 25(Ω)

**1**

(b) (i) 2(V)

*allow **1** mark for showing a correct method, ie 6 / 3*

**2**

(ii) equal to

**1**

**[4]**

**M4.**(a) (i) 50 (Hz)

**1**

(ii) 2760 (W)

**1**

(b) 12

*allow **1** mark for correct substitution, ie 2400/200*

***or***

*allow **1** mark for 2760/230 provided no subsequent step shown*

**2**

amps

**1**

(c) the charge is directly proportional to the time switched on for

*accept for **1** mark the longer time (to boil), the greater amount of charge*

***or** positive correlation*

***or** they are proportional*

**2**

**[7]**

**M5.** (a) (i) 15

**1**

(ii) 4.5 or their (a)(i) x 0.3 correctly calculated

*allow **1** mark for correct substitution, ie 0.3 x 15/their (a)(i), provided no subsequent step*

**2**

(ii) decrease

**1**

(b) **Y**

*accept any correct indication*

*reason only scores if **Y** is chosen*

*accept voltage for p.d.*

**1**

(only one that) shows a direct current / p.d.

**or**

a battery / cell gives a direct current

*accept both **X** and **Z** are a.c.*

**or**

a battery/cell gives a constant current/p.d.

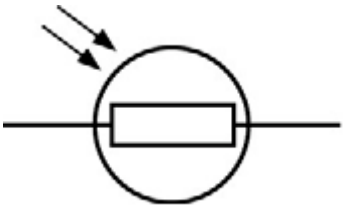
*accept it's a constant current/p.d.*

*it is not changing is insufficient*

**1**

**[6]**

**M6.** (a) (i) correct symbol ringed



**1**

(ii) accept any suggestion that would change light intensity, eg:

- torch on or off
  *accept power of torch*
  *do **not** accept watts / wattage of torch*
- distance between torch and LDR
- lights in room on or off
- shadow over the LDR

**1**

(b) resistance decreases

**1**

from 600 kΩ to 200 kΩ
*accept by 400 kΩ*

**1**

(c) (i) no numbers for light intensity
**or**
light intensity is categoric / a description / not continuous
*not enough results is insufficient*

**1**

(ii) YES

*mark is for the reason*

both show that resistance increases with decreasing (light)intensity / brightness

*accept they both get the same results / pattern*

**1**

(d) A circuit that automatically switches outside lights on when it gets dark.

**1**

**[7]**

**M7.** (a) (i) 6

**1**

(ii) variable resistor

**1**

(iii) voltmeter

**1**

(b) (i) point at 3 V ringed

**1**

(ii) The student misread the ammeter.

**1**

(iii) 1 (volt)

*accept every volt*

**1**

(c) as one increases so does the other**or**directly proportional**or**positive correlation

*accept a numerical description, eg when one doubles the other also doubles*

**1**

**[7]**