

# MARK SCHEME

# GCSE

## PHYSICS

## AQA - TRIPLE SCIENCE

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P2 - TEST 2  
ELECTRICITY  
Beginner

## Mark schemes

<b>1.</b>	Fan	C	1	
	Kettle	B	1	
	Lamp	D	1	
	Radio	E	1	<b>[4]</b>
<b>2.</b>	(a)	electrons	1	
	(b)	a positive	1	
	(c)	the forces are repulsive <i>allow the forces act in opposite directions</i>	1	
		the forces are equal in size <i>allow the forces are the same (size)</i>	1	
	(d)	reproducible	1	<b>[5]</b>
<b>3.</b>	(a)	(i) <b>D</b>	1	
		(ii) plastic or rubber <i>accept a specific type of plastic</i> <i>accept electrical insulator</i>	1	
	(b)	460 <i>allow 1 mark for correct substitution ie 2 × 230</i>	2	

(c) any **two** from:

- not all appliances need a 13 A fuse  
*idea that 13 A is (much) bigger than required by many appliances*  
*do **not** accept some appliances require more than 13 A*  
*do **not** accept 13 A fuse will blow*
- can choose the most suitable fuse (for the appliance)  
*accept install correct fuse for the appliance*
- (in the event of a fault) 13 A fuse may allow too much current to flow through an appliance  
**or**  
fuse may not melt (before appliance is damaged)
- may already have the fuse  
*idea of reusing a fuse*  
*do **not** accept cheaper unless explained correctly*

2

[6]

4.

(a) (i) 4.5

1

(ii) 2.25 or their (a)(i)  $\div$  2 correctly calculated

1

(iii)  $V_2$

1

(b) (i) 30

1

(ii) 8

*allow 1 mark for correct substitution*

*ie  $0.4 \times 20$*

*allow 1 mark for answers of 4 or 12*

2

(iii) Y

1

[7]

5.

(a) 25( $\Omega$ )

1

(b) (i) 2(V)

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

2

(ii) equal to

1

[4]

6.

(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) 1  
*accept every volt*
- (c) as one increases so does the other 1  
**or**  
 directly proportional  
**or**  
 positive correlation  
*accept a numerical description, eg when one doubles the other also doubles*

[7]

7.

- (a) 20 1
- (b) 50 1
- (c) (i) 115 1
- (ii) 230 1
- (iii) if one goes out the other still works 1  
**or**  
 brighter  
*accept power (output) is greater*  
*can be switched on/off independently is insufficient*
- (d) the outside/casing is plastic 1  
*there is plastic around the wires is insufficient*  
*it is plastic is insufficient*
- and plastic is an insulator 1  
*an answer the light fitting is double insulated gains both marks*

- (e) (residual current) circuit breaker  
*accept RCCB*  
*accept RCBO*  
*accept RCCD*  
*accept RCB*  
*accept miniature circuit breaker / MCB*  
*trip switch is insufficient*  
*breaker is insufficient*  
*do not accept earth wire*

1

[8]

8.

- (a) (i) earth wire

1

- (ii) double

1

- (b) if too much current flows through the wire

*accept power for current*

*do not accept electricity for current*

*accept if more than 20 amps flows through the wire*

1

the fuse (overheats and) melts

*accept 'blows' for melts*

*do not accept explodes / breaks / snaps etc*

1

breaking the circuit

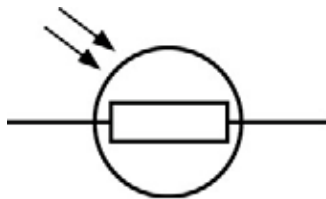
*accept stopping the current flow*

1

[5]

9.

- (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 k $\Omega$  to 200 k $\Omega$   
*accept by 400 k $\Omega$*

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]

10.

- (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]

11.

(a) charge

1

(b) (i) blue

1

(ii) earth wire

1

fuse

1

(c) (i) case is non-metal / non-conducting / plastic / insulator

*must refer to case / outside of appliance*

*do not accept plastic coating / covering*

1

(ii) earth (wire)

1

(d) (i) 60 (W)

*$P = 3 \times 20$  gains 1 mark*

*provided no subsequent step shown*

2

(ii) 15

*$300 = 20 \times Q$*

**or**

*$20 = 300 / Q$  gains 1 mark*

2

C / coulombs

*must clearly be upper case C accept J / V or As*

1

[11]