

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

(a) (i) 0.25 (A)

1

(ii) 75

allow 1 mark for converting 5 minutes to 300 seconds

or allow 1 mark for correct substitution

ie 0.25×300

allow 1 mark for an answer 1.25

allow 1 mark only for their (a)(i) $\times 300$ correctly calculated

2

coulombs or C

*do **not** accept c*

1

(b) any **two** from:

- fault not repaired
accept if a fault was to occur
- larger current will (still) flow
- aluminium foil will not melt (if a fault)
accept aluminium foil needs a higher current / charge to melt
- wiring will overheat / (may) cause a fire
accept idea of fire hazard
*do **not** accept explode etc*

2

[6]

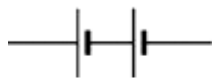
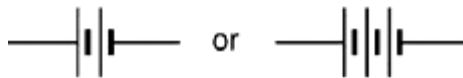
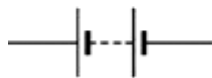
Q2.

(a) (i) ammeter and battery **in series** with the **gauge**

symbols must be correct

ignore a voltmeter drawn in series

accept



not



or cells reversed to cancel out

1

voltmeter in parallel with the gauge

symbol must be correct

accept a freestanding circuit

diagram provided strain gauge is labelled or a resistor symbol used for the strain gauge

1

(ii) d.c. flows only in one direction

a.c. changes direction is insufficient

1

(b) (i) 75

this answer only

*allow 1 mark for correct substitution **and** transformation,*

$$\text{ie resistance} = \frac{3.0}{0.040}$$

2

(ii) increases

1

(iii) elastic / strain potential

*do **not** accept potential*

1

[7]

Q3.

(a) (i) light dependent resistor / LDR

accept ldr

1

(ii) 25 (kilohms)

accept 24 - 26 inclusive

accept 25 000 Ω

1

- (iii) 5 (V) or their (a)(ii) correctly converted to ohms $\times 0.0002$ correctly calculated
*allow 1 mark for converting 25 k Ω /
 their (a)(ii) to ohms*
or
*allow 1 mark for correct substitution
 ie $0.0002 \times 25(000)$
or $0.0002 \times$ their (a)(ii)
 allow an incorrect conversion from kilohms providing this is clearly
 shown*

2

- (b) (i) linear scale
*using all of the available axis
 must cover the range 4 - 6 v
or their (a)(iii) - 6 v and lie within the range 0 - 15 inc.*

1

- (ii) negative gradient line
*do **not** allow lines with both positive and negative gradients*

1

passing through 20 lux and their (a)(iii)
*only scores if the first mark is awarded
 only scores if line does not go above 6 volts*

1

- (c) (i) 37.5 (k Ω) or their (a)(ii) + 50 % (a)(ii) correctly calculated

1

- (ii) light intensity value would be unreliable / not accurate

1

due to variation in resistance value
*accept because resistance varies by ± 50 %
 accept tolerance of resistor is too great
 do **not** accept results are not accurate*

1

[10]