

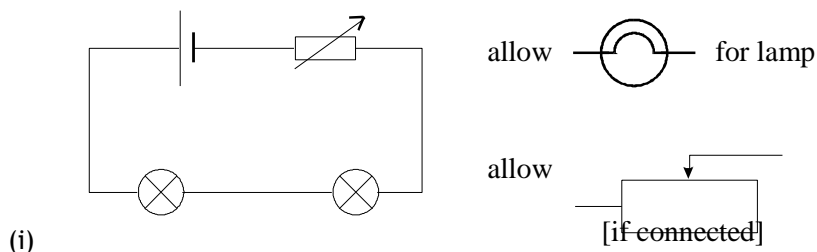
CELLS AND SIMPLE CIRCUITS

1.
  - A: Manganese IV Oxide mixed with carbon;
  - B: Ammonium chloride solution; (2mks)
2.
  - Dry cells uses paste electrolyte while wet cells uses solution of an electrolyte; (1mk)
3.
  - A secondary **battery** is capable of being recharged; its electrode reactions can proceed in either direction. [1m]

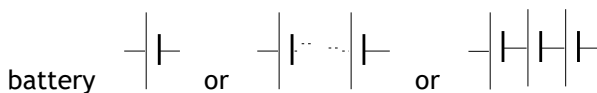
A **primary cell**, cannot be recharged with any efficiency, so the amount of energy it can deliver is limited to that obtainable

from the reactants that were placed in it at the time of manufacture.[1m]

4. (a)



(i)



battery

series circuit; (-1 for obvious gaps, more than 1mm)  
 only acceptable addition in parallel is a voltmeter. ignore extras  
 correct symbols;; (-1 for incorrect symbol or omission)  
 up to max 2. [only penalise lamp once, ignore extras]

3

(ii) thermal;

1

(b) (i) fan rotates / works / blows / (heater off) cold air given out /  
 / cold air blown out;

(ii) no current in the circuit / nothing / no effect;

(iii) fan rotates / works / blows and the heater is on/ hot air given  
 out / both work / hot air is blown out;

3

[7]

- 5.

(a) (i) circuit is broken/not complete/gap in circuit/connection broken/no  
 current in circuit;  
 [ignore because they are in series]

1

- (ii) dimmer/light dims/brightness decreases/eq; [Accept light goes down] [Ignore goes off] 1
- (iii) (circuit has) more resistance/less current/voltage across each lamp/voltage/energy/power shared amongst (more) lamps; [Reject charge] 1
- (b) (i) current can pass in resistor/resistor by-passes the filament/eq; [Accept it does not cause a break in the circuit/ it is a parallel circuit] 1
- (ii) An explanation to include:
  - 1. other lights would be dim/go out;
  - 2. because high (circuit) resistance/low current;
 [Accept resistor takes a bigger share of voltage/power/energy] 2

[6]

- 6.
- (a) 2A [1m]
  - (b) 2A[1m]

- 7.
- conventional circuit diagram with two lamps in parallel B1  
 switch in correct position alongside power supply B1  
 correct symbols for lamps and switch used B1

- 8.
- (a) 1 (L3)

P	off
Q	on
R	on

*accept 1 for 'on' and '0' for 'off'*  
*all three answers are required for the mark*

- (b) any one from 1 (L4)
  - battery *accept 'batteries'*
  - cell *accept 'cells'*

- (c) 2 (L4)
- |     |   |
|-----|---|
| on  |   |
| off | ✓ |

on	
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on	✓
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off ✓

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off

*if all three answers are correct, award two marks  
if two answers are correct, award one mark  
if more than one box is ticked for any circuit, award no credit for that circuit*

[4]