

MAINS ELECTRICITY

1. The fuse melts and switches off the circuit. [1m]
New path has less or zero resistance, so very high current flows [1m]

2. Solution

a. $I = V/R$

$$120/576$$

$$= 0.21 \text{ A}$$

b. $P = IV = (0.21 \text{ A})(120 \text{ V}) = 25 \text{ W}$ [2m]

3. (a)(i) piece missing
(accept hole in case/cracked/broken or words to that effect)
(a)(ii) access to live part(s)
(accept -could get a shock)

(a)(iii) Fuse
(ignore any reference to rating e.g. 13 A)

(a)(iv) fuses/melts/will not conduct (electricity)
(allow 'gets hotter')

(b)(i) plastic does not conduct (electricity)/is an insulator (of electricity)

(b)(ii) it is earthed/there is an earth wire

4. (a) green and yellow / yellow and green;
blue; brown; 3

- (b) (i) Any two from:
1. needs 3 wires / earth;
 2. largest current;
 3. largest power;
 4. smallest resistance;
- 2
- (ii) TV;
smallest power / current / uses less energy;
[Independent marks]
- 2
- (iii) A calculation to include:
1. power \times time;
 2. 2.2×0.5 ;

3. 1.1;
[If $2.2 \times 30 \text{ @ } 66$ - 2 marks

3

If $2200 \times 30 \text{ @ } 6600$ - 1 mark
If $2200 \times 0.5 \text{ @ } 1100$ - 2 marks]
[Equation can be implied by numbers]

[10]

5. green and yellow / yellow and green;
blue; brown; 3

6.

- | | | |
|-------|--|-----------|
| (i) | earth | 1 |
| (ii) | plastic/lamp/cover/base made from insulator/does not conduct electricity | 1 |
| | doubly insulated or plastic/lamp/cover/base cannot be live or cannot electrocute/shock | 1 |
| (iii) | 100 J (100 J/s first mark only) | 1 |
| | (electrical)(energy) used/transformed/converted/delivered/arrives per second | 1 |
| (iv) | $P = VI$ (in any form numerical or algebraic) | 1 |
| | 0.43(48) (accept 1 sig.fig.) | 1 |
| | Fuse: 0.5/1.0/2.0/3.0 A | 1 |
| (v) | VIt or Pt (in any form numerical or algebraic) | 1 |
| | 30×60 or 1800 (s) seen | 1 |
| | 180 000 J (3000 J 2/3; 0.05 kWh 3/3) | 1 |
| | | [Total11] |