**Electricity**

**Multiple Choice**

1 – D

2 – D

3 – B

4 – A

5 – A

6 – C

7 – E

8 – C

9 – A

10 – D

11 – C

12 – D

13 – A

14 – E

**Section 2**

1 a) P=V2/R (1) =122/100 (1) = 1.44 W (1)

b)(i) 1/RT=1/R1+1/R2+1/R3 (1) = 1/100 + 1/50 +1/50 (1) = 20Ω (1) (ii) No effect (1) Parallel so same I and V as before.

2 a)(i) V1/V2=R1/R2 (1) 2/V2=3/1050 (1) V2 = 700 Ω (1) (ii) 80 °C (1)

b)(i) R of thermistor rises (1) Voltage across thermistor increases (1) MOSFET switches on heater (1)

(ii) Comes on at colder temperature (1) Need higher resistance (1) to get share of voltage to operate switch (1)

3 a) All connections (1) All symbols (2) One wrong symbol (1)

b) R=V/I (1) = 2.5/0.5 (1) = 5Ω (1)

c) Dimmer (1) Parallel branch (1) Some current now through resistor (1)

4 a) X (1) Only allows current in one direction (1)

b)(i) E=Pt (1) = IVt (1) = 0.5 x 4 x 60 (1) = 120 J (1) (ii) Q=It (1) = 0.5 x 60 (1) = 30 C (1)

5 a) I=Q/t (1) = 24/0.0012 (1) = 20000 A (1)

b) 24/1.6 x 10-19 = 1.5 x 1020 (electrons) (1)

c) Current flows down the wire (1) into ground not the building (1)

6 a) In parallel with R (1)

b) Change the resistance of the variable resistor (1)

c) R=V/I (1) = 1/0.2 = 2.5/0.5 = 3.2 /0.64 = 6.2/1.24 (2) = 5Ω (1)

d) As voltage increases, resistance increases (1)

7 a)(i) Fuse symbol (1) (ii) To protect the appliance (1)

(iii) I=P/V (1) = 290/230 (1) = 1.26 A (1) Use 3A fuse (1)

b) Electrons move back and forth repeatedly (1)

8 a)(i) V1/V2 = R1/R2 (1) V1/12 = 25/40 (1) for 40, (1) for all other subs. = 7.5 V (1)

(ii) P=V2/R (1) = 7.52/25 (1) = 2.25 W (1)

b) (i) 1/RT = 1/R1 + 1/R2 (1) = 1/15 + 1/35 (1) so RT = 10.5 Ω (1)

(ii) Increase (1) R decreases (1) so current increases (1)