**Question 18** (5 marks)

**Resistor Colour Code Chart**

| *Colour* | *Value* | *Multiplying factor* | *Tolerance* |
|---|---|---|---|
| Black | 0 | 1 | – |
| Brown | 1 | 10 | 1% |
| Red | 2 | 100 | 2% |
| Orange | 3 | 1 000 | – |
| Yellow | 4 | 10 000 | – |
| Green | 5 | 100 000 | 0.5% |
| Blue | 6 | 1 000 000 | 0.25% |
| Violet | 7 | – | 0.1% |
| Grey | 8 | – | – |
| White | 9 | – | – |
| Gold | – | 0.1 | 5% |
| Silver | – | 0.01 | 10% |

(a) Use the Resistor Colour Code Chart to find the colour code of the resistor. **2**

| *Value* | *Tolerance* | *Band 1* | *Band 2* | *Band 3* | *Band 4* |
|---|---|---|---|---|---|
| 680 | 1% | Blue | Grey | Brown | Brown |

(b) Determine the maximum value of the following resistor, showing all working. **3**

| *Band 1* | *Band 2* | *Band 3* | *Band 4* |
|---|---|---|---|
| Red | Black | Blue | Gold |

Resistance = 20 x 1 000 000 Ω

tolerance = 5%

20 000 000 Ω x $\frac{105}{100}$

= 21 000 000 upper tolerance

21 MΩ