

S3 Technological Studies: Homework 11: Component Electronics.

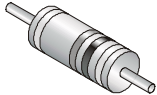

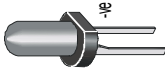
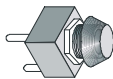
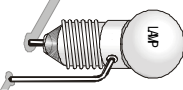
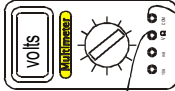
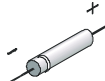
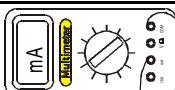
Mark:	/33
Grade:	

Name: _____ Class: _____ Date: _____

1. Complete the following statements by filling in the missing words

- (a) Electric current has the symbol _____ and is measured in _____ which has the symbol _____.
- (b) Voltage has the symbol _____ and is measured in _____ which has the symbol _____.
- (c) Resistance has the symbol _____ and is measured in _____ which has the symbol _____.

2. Draw the circuit symbols and name the following electronic components.

Component	Symbol	Name
		
		
		
		
		
		
		
		

3
2
1
0

3
2
1
0

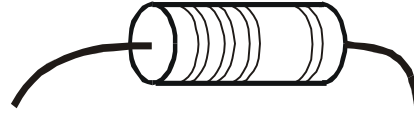
3
2
1
0

8
7
6
5
4
3
2
1
0

3. Using the resistor colour codes in your course notes and/or data book give the correct colours for the following values.

(a) $6K6 \pm 10\%$

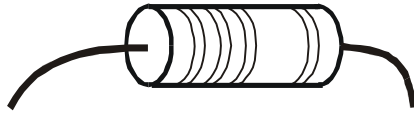
1st band: _____
 2nd band: _____
 3rd band: _____
 4th band: _____



2
1
0

(b) $270 R \pm 5\%$

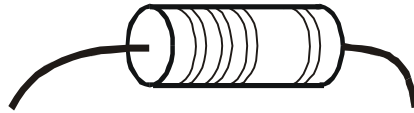
1st band: _____
 2nd band: _____
 3rd band: _____
 4th band: _____



2
1
0

(c) $1M2 \pm 2\%$

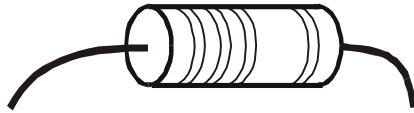
1st band: _____
 2nd band: _____
 3rd band: _____
 4th band: _____



2
1
0

(d) $39K \pm 10\%$

1st band: _____
 2nd band: _____
 3rd band: _____
 4th band: _____



2
1
0

4. Convert the following colour codes into the correct resistor values.

(a) red - violet - brown - gold

2
1
0

(b) red - red - green - silver

2
1
0

(c) Brown - black - red - brown

2
1
0

(d) yellow - violet - brown - red

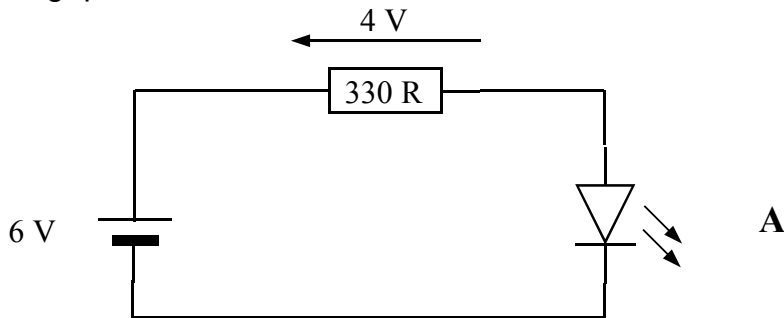
2
1
0

S3 Technological Studies: Homework 12: Component Electronics.

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Grade:	

Name: _____ Class: _____ Date: _____

1. A simple circuit is shown below, study the circuit and answer the following questions.



- (a) Name component A

- (b) (i) State Kirchoff's second law

- (ii) Using Kirchoff's second law, calculate the voltage across component A.

- (c) If the battery supplies a current of 0.1 mA, what will the current flowing through the resistor be?

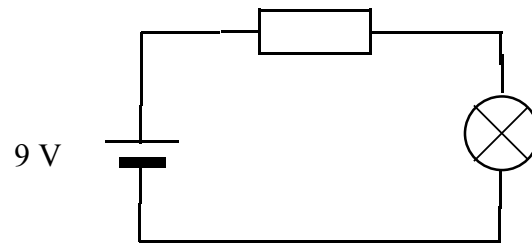
1
0

1
0

3
2
1
0

1
0

2. A pupil constructs the following circuit.



- (a) On the diagram show, using the correct symbols, where you would position an Ammeter and a Voltmeter to measure the current and voltage flowing through the bulb.
- (b) If the Voltmeter and Ammeter show readings of 3 V and 0.5 A respectively, calculate:
- (i) The resistance of the bulb.

(ii) The value of the resistor in the circuit.

3. If four bulbs are connected in series, each with a rating of 1.5 V and drawing 0.2 A. Calculate:

(a) The individual resistance of each bulb

(b) The combined resistance of the four bulbs

4
3
2
1
0

3
2
1
0

3
2
1
0

3
2
1
0

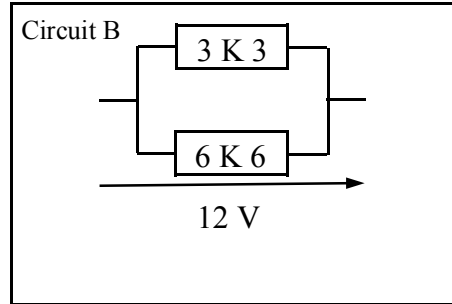
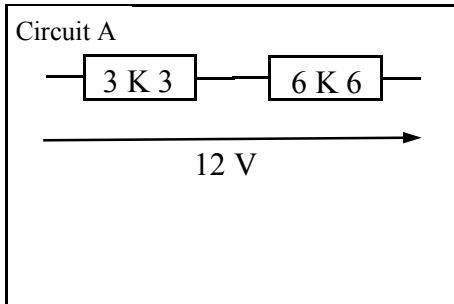
3
2
1
0

S3 Technological Studies: Homework 13: Component Electronics.

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Grade:	

Name: _____ Class: _____ Date: _____

1. Two examples of parts of electronic circuits are shown below,



(a) In the space below each diagram, name each configuration of circuit.

(b) For circuit A, calculate:

(i) The total resistance of the circuit.

(ii) The current that would be drawn from the battery.

(b) For circuit B, calculate:

(i) The total resistance of the resistors.

(ii) The current flowing through each resistor.

2
1
0

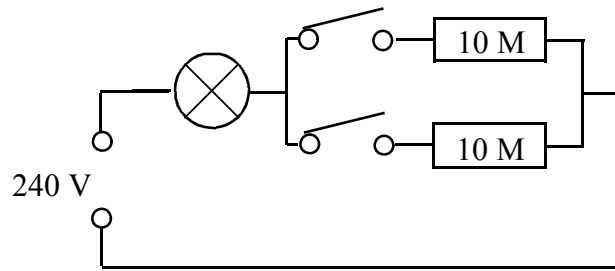
3
2
1
0

3
2
1
0

3
2
1
0

5
4
3
2
1
0

2. An electric heater has two heating elements and a power indicator connected as shown in the diagram below.



- (a) If the bulb is rated for 100 V at 0.1 A, calculate the resistance of the bulb.
- (b) Calculate:
- The total resistance of the circuit if only one heating element is switched on.
 - The total resistance of the circuit if both of the heating elements are switched on.
- (c) Calculate the power consumed by the heater if both heating elements are switched on.

3
2
1
0

3
2
1
0

3
2
1
0

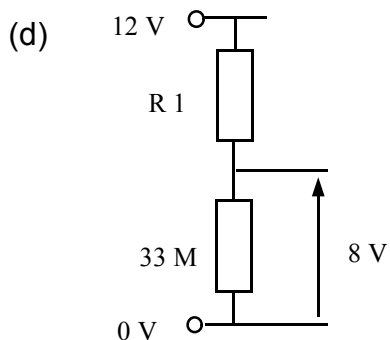
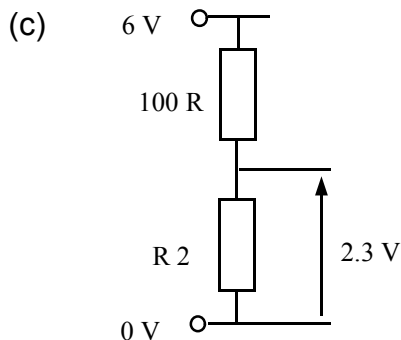
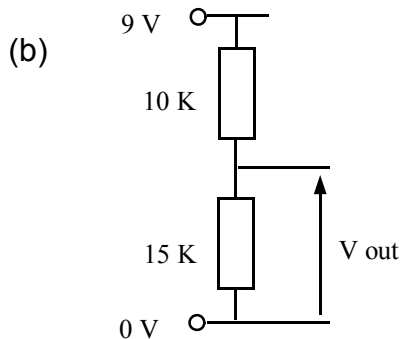
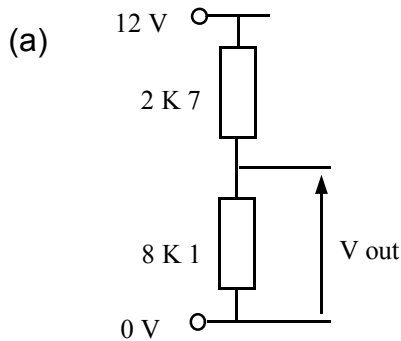
5
4
3
2
1
0

S3 Technological Studies: Homework 14: Component Electronics.

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Name: _____ Class: _____ Date: _____

1. For each of the following circuits, calculate the unknown quantity:



3
2
1
0

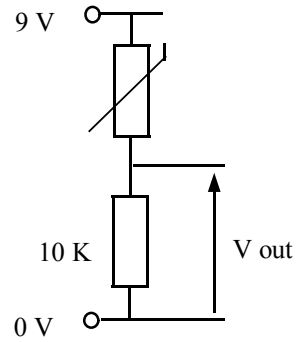
4
3
2
1
0

4
3
2
1
0

4
3
2
1
0

2. (a) The following circuit uses a type 7 thermistor, using your data book determine the resistance of the thermistor at 150 C.

(b) Calculate the output voltage at this temperature.



(c) Describe fully what will happen to the resistance of each component and the output voltage as the temperature decreases

3. An automatic streetlamp system is designed to turn on the lamp at night.

(a) Using your data book, determine the resistance of the LDR when the illumination falls to a value of 10 lux.

(b) Using a fixed resistor, an LDR and a 12 V power supply, draw a suitable circuit diagram that will turn the streetlamp on when it gets dark.

1
0

3
2
1
0

4
3
2
1
0

1
0

4
3
2
1
0

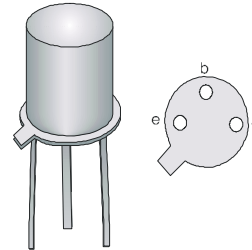
S3 Technological Studies: Homework 15: Component Electronics.

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Name: _____ Class: _____ Date: _____

1. (a) Name the electronic component shown.

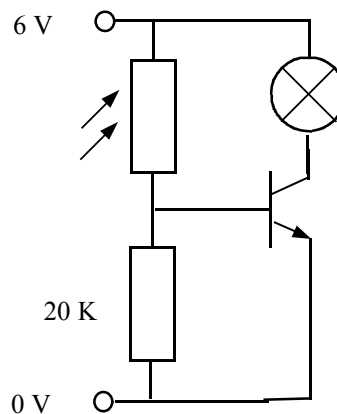
(b) Draw the circuit symbol for this component and label the legs using the following terms, **Base**, **Emitter** and **Collector**.



1
0

2. A pupil constructs the circuit shown to switch a light on when the ambient light level falls below a preset level.

(a) Calculate the voltage across the fixed resistor when the ambient light level is 100 lux.



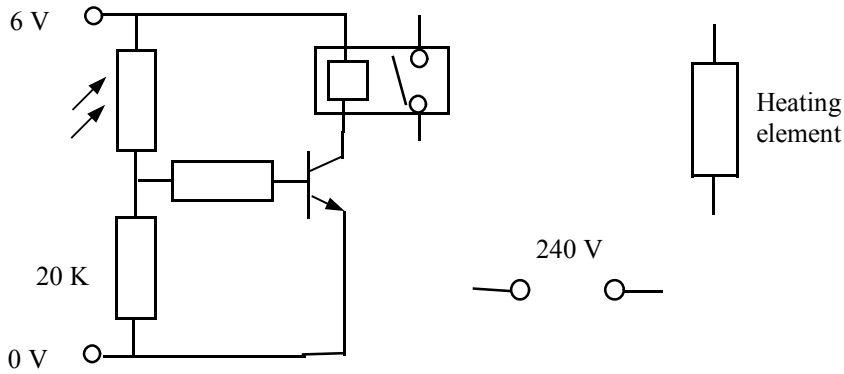
4
3
2
1
0

(b) Will this voltage be enough to switch the bulb on? Explain your answer.

3
2
1
0

2
1
0

3.



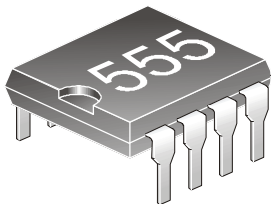
A prototype circuit for an automatic heating system is shown in the diagram above.

- Complete the wiring diagram to show how the relay could be connected to the heating system and its power supply.
- Explain, using appropriate technical language, the operation of the circuit.

3
2
1
0

4
3
2
1
0

4. The following components can be used to make timing circuits.

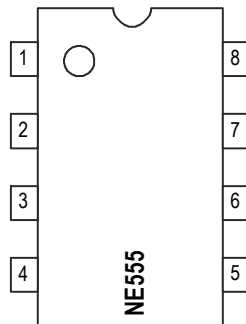


Component A



Component B

- In the space beside each diagram, name each of the components shown.
- Complete the diagram below to show the pin functions of component A.



2
1
0

4
3
2
1
0