

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date Due: \_\_\_\_\_

1. Identify if the following devices are **analogue** or **digital** and put them into the table under the correct headings.

*Mercury thermometer, MP3 player, radio, electronic thermometer, computer, video timer, cuckoo clock.*

Digital	Analogue

2

2. Complete the following table.

Device	Energy change
	electrical to sound
motor	
microphone	
	light to electrical
	electrical to light
solenoid	

6

3. The label on a box of LED's carries the following information

$$V_{\max} = 1.5 \text{ V} \quad I_{\max} = 8 \text{ mA}$$

- a) Draw and label the circuit which can be used to light the LED correctly.

2

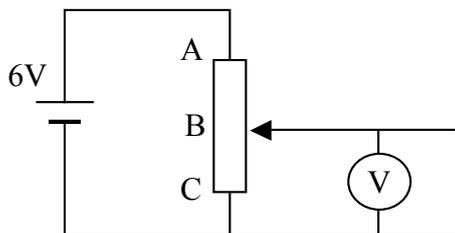
- b) If the LED is to be used with a 6 V power supply, calculate the value of the resistor that must be used in the circuit.

4

/14

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date Due: \_\_\_\_\_

1. What will the voltmeter read when the sliding contact is at

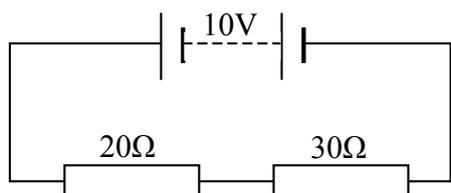


position A? ..... (1)

position B? ..... (1)

position C? ..... (1)

2.



(i) Calculate the total resistance.

(2)

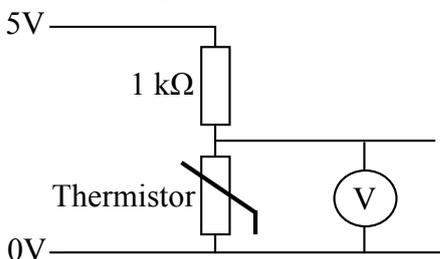
(ii) Calculate the current in the circuit.

(2)

(iii) Calculate the voltage across each resistor.

(3)

3. At room temperature the thermistor has a value of  $1\text{ k}\Omega$ .



(a) What will be the reading on the voltmeter at room temperature?

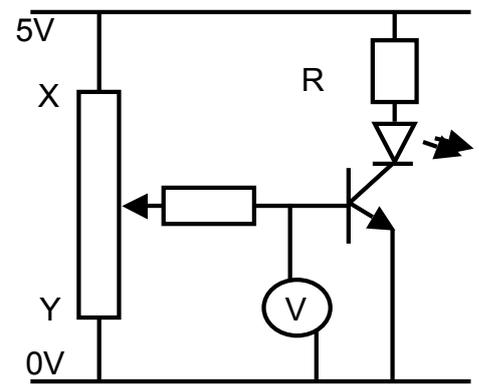
(2)

(b) The thermistor is now heated to  $100^\circ\text{C}$  and its resistance changes to  $100\ \Omega$ . What will be the new reading on the voltmeter?

(4)

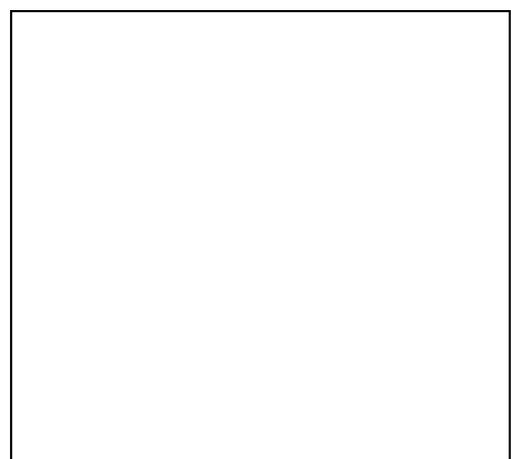
Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date Due: \_\_\_\_\_

1. a) Explain what will happen to the LED as the potentiometer is turned from Y to X ..... (2)
- b) At what position of the potentiometer is the transistor OFF? ..... (1)
- c) What will the Voltmeter read when the transistor is fully ON? ..... (1)



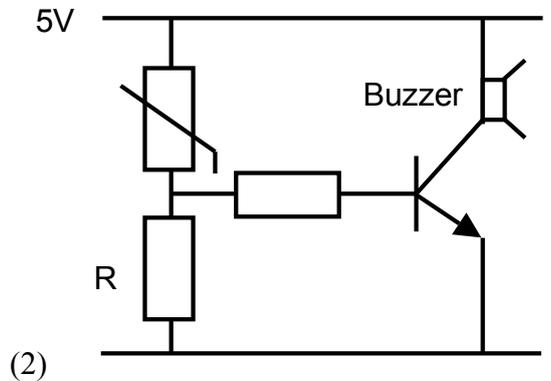
2. a) Draw a diagram of a circuit, in the space provided, which will switch on a light when the room becomes too dark. .... (3)
- b) Explain how this circuit works. .... (3)

.....  
 .....  
 .....  
 .....



3. This circuit is used as an alarm. The thermistor is positioned in a car engine. At normal temperatures, the transistor is OFF. Explain what will happen if the engine overheats. .... (2)

.....  
 .....  
 .....  
 .....



4. This diagram shows the possible arrangement for the interior light in a car. When the door is shut, the switch is open.

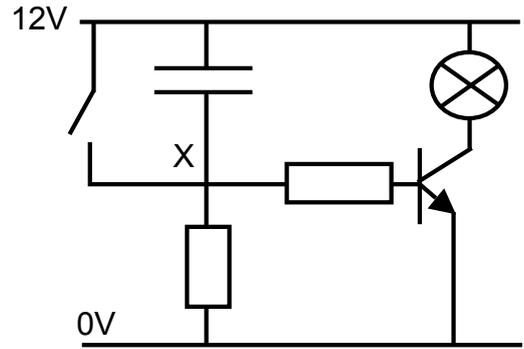
- a) What is the voltage at X? ..... (2)
- b) Is the light ON or OFF? ..... (1)

When the door is opened, the switch closes.

- c) What is the voltage at X now? ..... (1)
- d) What happens to the light? ..... (1)
- e) Explain what happens when the door is shut again.

.....  
 .....  
 .....

(3)



Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date Due: \_\_\_\_\_

1. Draw the correct symbol and name the type of gate for each truth table below. Explain what each gate does in the space provided.

a)

A	B	X
0	0	0
0	1	1
1	0	1
1	1	1

b)

A	X
0	1
1	0

c)

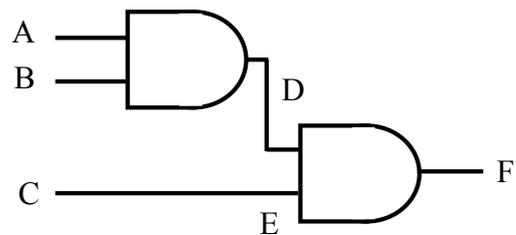
A	B	X
0	0	0
0	1	0
1	0	0
1	1	1

- a) .....
- b) .....
- c) .....

(9)

2. Study the diagram and complete the truth table.

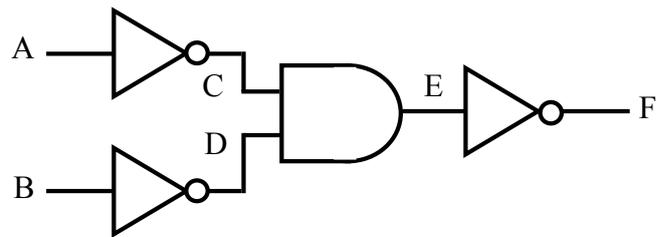
A	B	C	D	E	F
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			



(6)

3. Complete the truth table for the circuit given.

A	B	C	D	E	F
0	0				
0	1				
1	0				
1	1				



(4)

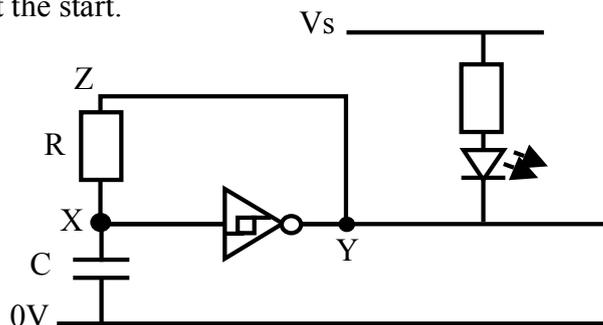
What single gate will have the same function? .....

(1)

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date Due: \_\_\_\_\_

1. This circuit opposite is made and C is uncharged at the start.

- a) What is the voltage at X? .....
- b) What logic level is this? .....
- c) What will the logic level at Y be? .....
- d) What will the logic be at Z? .....
- e) What now happens to C? .....
- f) What happens to the voltage at X? .....
- g) What will the logic level at X eventually reach? .....
- h) What will the logic level at Y now become? .....
- i) What is the voltage at Z now? .....
- j) What now happens to the capacitor? .....
- k) What now happens to the voltage at Z? .....
- l) What does the logic level at X eventually become? .....
- m) What happens now? .....



..... (6)

..... (2)

2. a) What is the name of a device which counts up pulses of voltage? ..... (1)

b) Name a practical device which will contain such a circuit.  
 ..... (1)

c) The output from these circuits is usually in binary code.

Complete the following table opposite.

Number of pulses	Code
	0000
9	
	0010
	0110
8	
	0111
5	
	0011
4	
1	

(5)