

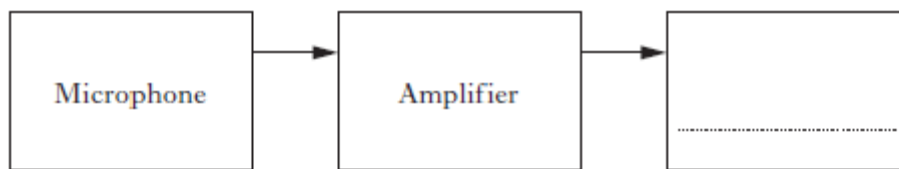
## 2.3 Electronics Homework Questions

1. An electronic megaphone is used by police to give instructions to large numbers of people.

A Megaphone is a device that amplifies the voice of the person using it.

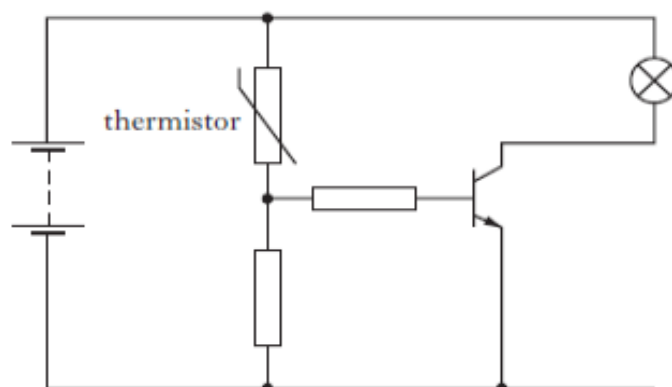


- (a) The megaphone consists of an electronic system.  
An electronic system can be represented by a block diagram.  
The electronic devices used for the first two parts of the electronic system are shown below.  
Copy and complete the diagram adding a suitable output device



1

2. An electronic circuit, used to give a warning, is shown below.



- (a) (i) What causes the resistance of the thermistor to change?

1



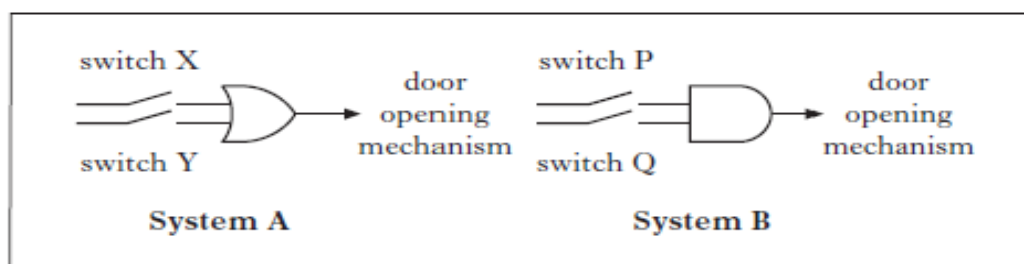
(b) Some electronic devices are listed below:

LED Relay Switch Motor Solar Cell LDR Solenoid

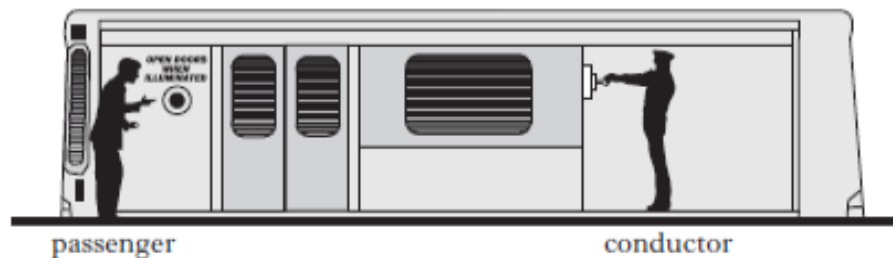
From the list, state two digital input devices.

1

3. Two logic systems, A and B, for controlling door opening mechanisms are shown.



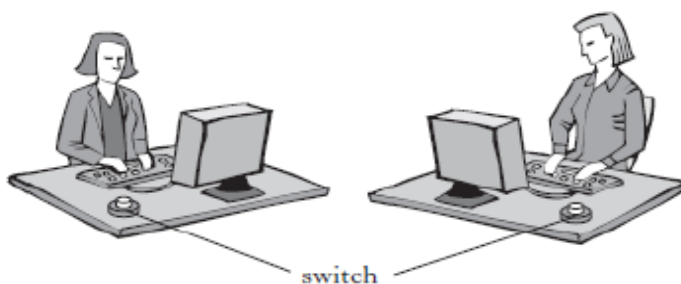
To open the passenger doors on a train, the button marked "Open Doors When Illuminated" must be pressed. To illuminate the button the conductor closes a master switch using a key.



(a) Explain which system, A or B should be used in this situation.

2

(b) The main entrance doors in a school can be opened by either of two office staff using a switch on their desk.



Explain which system, A or B, should be used in this situation.

2

4. A supermarket uses an open display cabinet which keeps fresh food cold. The temperature of the cabinet is monitored and displayed using a digital thermometer. The digital thermometer is an electronic system.

- (a) This system can be represented by a block diagram as shown.  
What is the missing label?



1

- (b) The list below shows the names of some input devices:

**Light dependent resistor (LDR), switch, capacitor, thermistor, microphone**

- (i) Choose an appropriate input device from the list that could be used to monitor the temperature. **1**
- (ii) Suggest an output device that could be used to display the temperature. **1**

5.

A high intensity LED is used as a garden light. The light turns on automatically when it becomes dark.

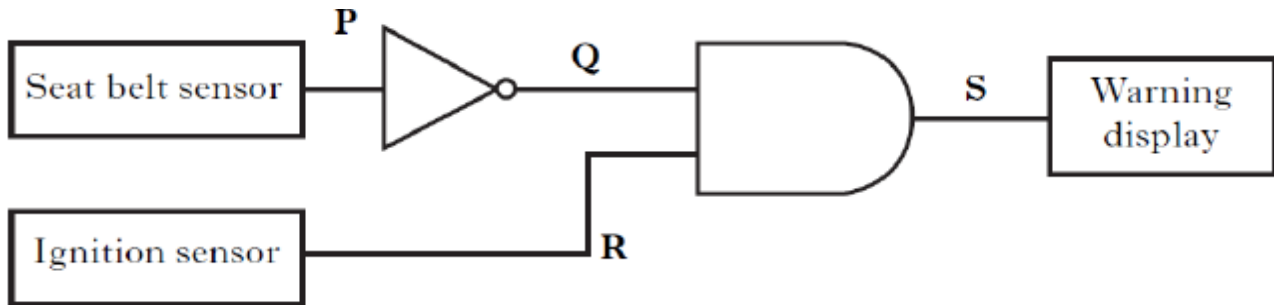


The light also contains a solar cell which charges a rechargeable battery during daylight hours.

State the energy transformation in a solar cell.

1

6. An electronic device warns a car driver when the seat belt has not been fastened. The device only operates when the ignition is switched on. The device contains the logic circuit shown.



The seat belt sensor produces logic 1 when the seat belt is fastened and logic 0 when the car ignition is off.

- (a) (i) Suggest a suitable output device that will illuminate the warning display. **1**  
 (ii) Complete the truth table for the logic levels P, Q and S in the circuit. **3**

Seat belt	Ignition	P	Q	R	S
unfastened	off			0	
unfastened	on			1	
fastened	off			0	
fastened	on			1	

- (c) The car has another electronic device that also contains a logic gate. The truth table for this logic gate is shown below.

Input 1	Input 2	Output
0	0	0
0	1	1
1	0	1
1	1	1

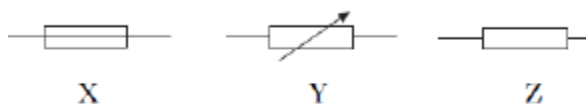
C continued.....

- (i) Name this logic gate. 1  
 (ii) Draw the symbol for this logic gate. 1

(d) The temperature outside the car is measured with an electronic thermometer and displayed on a screen. What input device could be used in the electronic thermometer. 1

**7.**

Three circuit symbols X, Y and Z are shown.



Which row in the table identifies the symbols X, Y and Z?

	X	Y	Z
A	thermistor	transistor	resistor
B	fuse	variable resistor	thermistor
C	transistor	fuse	variable resistor
D	fuse	variable resistor	resistor
E	variable resistor	resistor	fuse

**1**

**Total Marks available = 18**