Problem solving using ICT

A computer uses the following control port to monitor and control a household security system:

0	1	2	3	4	5
0	0	0	0	0	0

Output bits
- 0 – alarm lights
- 1 – motor to close shutters
- 2 – siren

Input bit
- 3 – sensor on front door
- 4 – pressure mat

1. If the burglar stands on the pressure mat, an alarm light would come on.

2. If a burglar opens the front door, the siren would come on.

3. If the burglar stands on the pressure mat and opens the front door, the alarm light would come on, the siren would come on and the window shutter would close.

All the bits are set to zero, but if the input bits are set to one the corresponding output bits would also be set to 1 .

Write down the display of bits in the following situations

a) A burglar has stepped onto the pressure mat.

Answer:

0	1	2	3	4	5
1	0	0	0	0	1

b) A burglar has opened the front door.

0	1	2	3	4	5
0	0	0	1	1	0

c) If the burglar stands on the pressure mat and opens the front door, the alarm light would come on and the siren would come on and the window shutters would close.

0	1	2	3	4	5
1	1	1	1	1	1

Source: WJEC GCSE INSET Document on Paper 1. Cardiff. March 2003.