16 = F
A1 = 17

26 = 1A
35 = 23
B1 = 177

a) i) 10 = A

ii) 45.

$$2\overline{)45}\ 1 \quad 2\overline{)22}\ 0 \quad 2\overline{)11}\ 1 \quad 2\overline{)5}\ 1 \quad 2\overline{)2}\ 0 \quad 1$$

01101 ∴ B3 is the Answer

iii) 1110
− 0111
1000
+ 1 (2's comp.)
1010

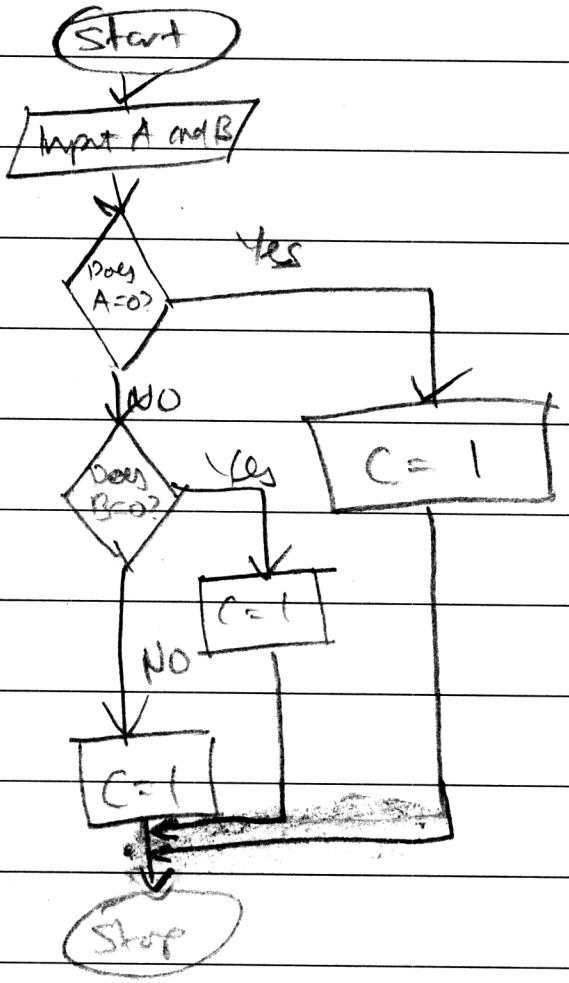
∴ Ans: 1010

b) i) A flip-flop achieves its purpose by using a number of gates to achieve its wanted outcome. It inputs 3 different values and ends up with 2.

ii And gate.

A	B	C
0	1	0
1	0	0
1	1	1

OR gate



c) The data stream that would be sent from the scanner to the central computer would consist of image bits and then it would have to be compared. The data sent to the door would only consist of a 0 or 1, a true or false, to open the door. A 0 would mean locked and a 1 would mean open.

The header information would contain the person details (e.g. name, D.O.B, address etc). The data characters would be the finger prints and the trailer information would be any other information about the individual.

From the computer to the door, the header information would contain the comparsion of the fingerprints. The data characters would contain the ~~right~~ valid or invalid to open the door. And for the trailer information it would contain stuff like (e.g. voice commands and the sort).