Answer the questions below in the spaces provided.

1. Numbers are stored in a computer system as *binary*:

a) Convert the 8-bit binary number 1010 0001 into decimal. Show your working. (1)

_____

b) Convert the decimal number **123** into an 8-bit binary number. Show your working. (1)

_____

2. In Chemistry, Avogadro's number, 6.0221415×10^{23} is the number of atoms in a mole.

How would this number be stored in binary? (2)

_____

_____

_____

3. Kieran is writing a procedure for a game in a high level language:

a) Why does a high level language need to be translated into machine code? (1)

_____

_____

b) Kieran checks the procedure to make sure it works correctly before he moves on. State the type of translator he would use while he is working on the procedure and state an advantage of working this way. (2)

_____

_____

_____

c) How could Kieran create a stand-alone program when he has finished creating and checking all his procedures? (1)

_____

_____

4. Program instructions have to be stored and processed in a set order:

a) Inside the processor, where are the instructions stored before being processed? (1)

_____

b) State the part of the processor responsible for timing the processing of each instruction. (1)

_____

5. Text and characters are stored as binary using the ASCII code:

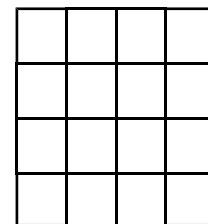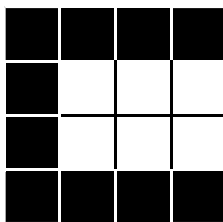**a)** How many bits would be used to store the following statement? (2)

> *IT Rules!*

Show your working:-

_____

_____

b) Explain why the telephone number 07798 456789 should be stored as text and not as a number. (1)

_____

6. Below is a representation of a black & white 4X4 pixels image.

a) Use the grid on the right to show how the image would be stored in machine code. (1)

IMAGE

b) Calculate the storage requirements of the image. (1)

_____

c) Calculate the storage requirements in **bytes**, if each pixel had 16 bit colour depth. (3)

_____

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