1. The memory of a computer contains data and instructions in binary.

    The following instruction is stored in a location of the memory.

0	0	1	0	1	0	0	1	1	1	1	1	1	1	0	0

(a) Convert the instruction into hexadecimal.

....

....

.... [2]

(b) Explain why a programmer might prefer to read the instruction in hexadecimal rather than in binary.

....

....

....

....[2]

(c) Give **two** other uses of hexadecimal.

Use 1 ....

....

Use 2 ....

....[2]

2. **(a)** The denary number 57 is to be stored in two different computer registers.

Convert 57 from denary to binary and show your working.

....

....

....

....[2]

(b) Show the binary number from **part (a)** as it would be stored in the following registers.

Register 1

Register 2

[2]

(c) A binary number stored in a register can have many different uses, for example an address in main memory.

Give **two** other uses for a binary number stored in a register.

Use 1 ....

Use 2 ....

[2]

(d) A register in a computer contains binary digits.

| 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |

The contents of the register represent a binary integer.

Convert the binary integer to hexadecimal.

....

....[1]

3. The memory of a computer contains data and instructions in binary
The following instruction is stored in a location of the memory.

0	0	1	0	1	0	0	1	1	1	1	1	1	1	0	0

(a) Convert the instruction into hexadecimal.

....

....

....[2]

(b) Explain why a programmer might prefer to read the instruction in hexadecimal rather than in binary.

....

....

....

....[2]

(c) Give **two** other uses of hexadecimal.

Use 1

....

....

Use 2

....

....[2]

4. A robot arm in a factory is programmed to move products.

The binary instructions to operate the robot arm are:

Operation	Binary Instruction
UP	1 1 1 1
DOWN	0 0 0 1
LEFT	1 0 0 1
RIGHT	0 1 1 0
OPEN	1 1 0 0
CLOSE	0 0 1 1

The instructions are entered as hexadecimal values. An operator enters the values:

9   1   C   3   F

Convert the values and write down the operation (e.g. RIGHT) carried out by the robot arm.

9 ....

1 ....

C ....

3 ....

F ....   [5]

5. **(a)** Explain the differences between the binary number system and the denary number system.

....

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....[4]

(b) Explain the process of converting the binary number 1010 into a denary number.

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.... [5]

6. The memory of a computer contains data and instructions in binary.

The following instruction is stored in a location of the memory.

0	0	1	0	1	0	0	1	1	1	1	1	1	1	0	0

(a) Convert the instruction into hexadecimal.

....

....

....[2]

(b) Explain why a programmer might prefer to read the instruction in hexadecimal rather than in binary.

....

....

....

....[2]

(c) Give **two** other uses of hexadecimal.

Use 1 ....

....

Use 2 ....

....[2]