1

    (i) Convert the denary number **132** into an 8 bit binary number.

       ---**[2]**

    (ii) Convert the binary number **10110101** to its hexadecimal equivalent.

       ---**[2]**

    (iii) Show the effect of a binary shift right of two places on the binary number **00110100**.

       ---**[1]**

    (iv) Describe a shift that can be used to double the value of the binary number **00100100**.

---[2]

2   The security code for an alarm system is a long binary number which begins

10001111100101111011 …

The technicians prefer to use hexadecimal to enter the security code.

(i) When the number is converted into hexadecimal, the first two digits are 8F as shown below.

Complete the gaps to show the next three digits.

Binary:	1000	1111	1001	0111	1011
Hexadecimal:	8	F	....	....	....

[3]

(ii) Explain why the technicians prefer to use hexadecimal.

---[2]

3   A computer records an audio file of someone playing a guitar.

Convert the binary number 11001011 into denary.

---[1]

4

(i) Add together the following two 8 bit binary numbers. Express your response in an 8 bit binary form.

01101010

<u>10010110</u>

----
[2]

(ii) Identify the problem this addition has created.

----
[1]

5   A computer records an audio file of someone playing a guitar.

       Complete a 2-place shift to the right on the binary number 11001011.

       -- [1]

6(a)   Convert the binary number **1011011** to denary. Show your working.

       -- [2]

   (b) Add the following binary numbers.

$$\begin{array}{r} 1\ 0\ 1\ 1\ 0\ 1\ 1\ 0 \\ +\quad\ \ 1\ 0\ 0\ 1\ 1\ 1 \\ \hline \end{array}$$

                                                                                         [2]

7   Complete a 2 place right shift on the binary number 11001011.

       -- [1]

8   Convert the decimal number 191 into an 8 bit binary number.

       -- [1]

9(a) Add the following two 8-bit binary numbers.

$$1 \quad 0 \quad 0 \quad 1 \quad 1 \quad 0 \quad 1 \quad 1$$

$$0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 0$$

_____

_____

[2]

(b) An overflow error can occur when adding two 8-bit binary numbers.

Describe what is meant by an overflow error.

--[2]

10(a) Convert the decimal number 191 into 8-bit binary.

--**[1]**

(b) Perform the following binary addition

$$+\begin{array}{r} 01101011 \\ 01011011 \\ \hline \end{array}$$

[2]

11 Convert the hexadecimal number **A3** to denary. Show your working.

--**[2]**

12   Convert the hexadecimal number 3E into a decimal number. You must show your working.

   ----
                                                                              [2]

13   A binary shift can be performed on a binary integer.

   Identify which shift will multiply a number by 8.

                                                                              [2]
   ----

14   Numbers can be represented in denary, binary or hexadecimal.

   (i) Convert the binary number 01101001 to denary, showing your working.

      -- [2]

   (ii) Convert the denary number 154 to binary.

      -- [2]

END OF QUESTION PAPER