Name: Class:

**Task 1**

1. (a) Apply a right shift of one binary place on the following byte.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
|  |  |  |  |  |  |  |  |

(b) Convert the original and shifted binary numbers into denary.

(c) What is the effect of the logical right shift?

1. (a) Apply a left shift of one binary place on the following byte.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
|  |  |  |  |  |  |  |  |

(b) Convert the original and shifted binary numbers into denary.

(c) What is the effect of the binary shift?

3. (a) The binary number: 1101 1001 is stored in an 8-bit register. A right shift is carried out and the result is stored in the register. After processing, state the binary value stored in the register.

(b) State the denary value stored in the register before and after the right shift.

Before:

After:

(c) Explain the problem that has occurred with the least significant bit stored in the register.

**Task 2**

1. Complete the table below by converting the binary numbers shown to their two’s complement. Also add in the denary equivalent of all binary numbers shown.

The first row has been completed for you.

|  |  |  |  |
| --- | --- | --- | --- |
| **Binary number** | **Denary equivalent** | **Two’s complement** | **Denary equivalent** |
| 0101 0001 | 81 | 1010 1111 | -81 |
| 0110 0110 |  |  |  |
| 0011 0111 |  |  |  |
| 0101 0100 |  |  |  |
| 0000 0000 |  |  |  |
|  |  | 1101 0101 |  |
|  |  | 1000 0110 |  |

2. Write an algorithm to explain how you convert an 8-bit binary number to it’s two’s complement.