COMP-228 Assignment 2

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**Question 1**

Truth table of :

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| F | F | F | T |
| F | F | T | T |
| F | T | F | F |
| F | T | T | T |
| T | F | F | F |
| T | F | T | F |
| T | T | F | F |
| T | T | T | T |

1. Using {‘X’, ‘F’}

|  |  |  |
| --- | --- | --- |
|  |  |  |
| F | T | T |
| T | F | F |

Thus,

1. Using {‘X’, ‘T’}

|  |  |  |  |
| --- | --- | --- | --- |
|  | q |  |  |
| T | T | T | T |
| T | F | F | F |
| F | T | F | F |
| F | F | F | F |

Thus,

1. Using {‘X’,’~’}

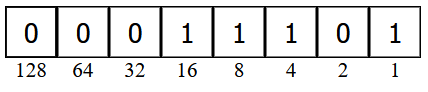
|  |  |  |  |
| --- | --- | --- | --- |
|  | q |  |  |
| T | T | T | T |
| T | F | T | T |
| F | T | T | T |
| F | F | F | F |

Thus,

**Question 2**

Convert the following binary and hex to decimal numbers:

1. Binary to decimal:
   1. 11101:

= 16+8+4+1=29

* 1. 11101 11110:

* 1. 11101 11110 11101 10111:

1. Hex to decimal:
   1. AE1:

* 1. AEBA1:
  2. AEBA1 51DE1:

**Question 3:**

**Question 4**

1. Multiply 10011 11100 (27c) by 11010 (1a)

|  |
| --- |
|  |
|  |
|  |
| Same thing for the other half |

So, we have 2793 for the first half. Now we should calculate the second half

The second half is . And thus, the final answer is

**Question 5**

1. Proof:

This statement is always true regardless of the value of n. We are subtracting form the left-hand-side while on the right-hand-side we are only subtracting -1.

Now find the maximum number we can add without producing overflow:

Which means that for . The maximum number that can be added is

1. Using