**Basic Electricity and Electronics**

**Module Two - Problem Worksheet Key**

1. Convert the decimal number **131** to binary:

**010000011**

1. Convert the binary number **11010101** to decimal:

**213**

1. Convert the binary number **11001001** to hexadecimal:

**C9**

1. Convert the decimal number **758** to hexadecimal:

Convert to binary: **001011110110**

Group 4 bits each: **0010 1111 0110** **= 2F6h**

5. Convert the hexadecimal number **B6A** to decimal:

Convert to binary: 1100 0110 1010

* + 2048+1024+64+32+8+2 = **3178**

1. Give the truth table for an inverter:

A X

* 1. 1
  2. 0

1. Give the truth table for an OR gate:

A B Q

0 0 0

0 1 1

1 0 1

1 1 1

8. Give the truth table for an AND gate:

A B Q

0 0 0

0 1 0

1 0 0

1 1 1

9. Give the truth table for two input (A and B) addition:

|  |  |  |  |
| --- | --- | --- | --- |
| A | B | Σ | Co |
| 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |

1. Draw the schematic symbol on an NPN transistor, label the leads, and indicate the proper polarities for operation:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | Collector (+)(large |  |  |
|  |  |  |  | pos) |  |  |
| Base |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |
| (+) |  |  |  |  |  |  |
| (small |  | |  | Emitter (neg, or |  | |  |
| pos) |  | |  | ground) |  | |  |
|  |  |  |  |  |  | |  |
|  |  |  |  |  |  | |  |



1. Draw the schematic symbols for the inverter, the OR gate, and the AND gate:

