CS150 - Computer Organization and Architecture
Homework #1 - Spring 2016

Due on or before Monday, February 1 at 14:20 PDT

Name _____

In all of the exercises in this assignment, please clearly indicate your answer and show your work for full credit.

1. Convert the following binary numbers to equivalent decimal numbers.

- *(a)* $(00001101)_2$
- *(b)* $(00010001)_2$
- *(c)* $(01101101)_2$
- *(d)* $(11011101)_2$
- *(e)* $(11111111)_2$
- *(f)* $(11100.011)_2$

2. Convert the following decimal numbers to equivalent binary numbers.

- *(a)* $(67)_{10}$
- *(b)* $(54)_{10}$
- *(c)* $(255)_{10}$
- *(d)* $(256)_{10}$
- *(e)* $(2416)_{10}$
- *(f)* $(4095)_{10}$

3. Convert the following octal numbers to equivalent decimal numbers.

- *(a)* $(35)_8$
- *(b)* $(2343)_8$

4. Convert the following decimal numbers to equivalent octal numbers.

- *(a)* $(19)_{10}$
- *(b)* $(132)_{10}$
- *(c)* $(512)_{10}$

5. Convert the following hexadecimal numbers to equivalent decimal numbers.

- *(a)* $(C4)_{16}$
- *(b)* $(1FF)_{16}$
- *(c)* $(2AB6)_{16}$

6. Convert the following decimal numbers to equivalent hexadecimal numbers.

- *(a)* $(30)_{10}$
- *(b)* $(312)_{10}$
- *(c)* $(513)_{10}$

7. Convert the following binary numbers to equivalent octal numbers.

- *(a)* $(11101)_2$
- *(b)* $(101101101)_2$
- *(c)* $(10110101)_2$

8. Convert the following binary numbers to equivalent hexadecimal numbers.

- *(a)* $(101010)_2$
- *(b)* $(111100110)_2$
- *(c)* $(11010101)_2$

9. Miscellaneous - Perform the following base conversions.

- *(a)* $(341)_5 = (?)_{10}$
- *(b)* $(76)_{10} = (?)_7$
- *(c)* $(1101001)_2 = (?)_4$
- *(d)* $(BFE)_{16} = (?)_{12}$
- *(e)* $(2112)_3 = (?)_8$
- *(f)* $(7AD)_{16} = (?)_{10}$
- *(g)* $(6101)_7 = (?)_{10}$

10. Perform the following **unsigned binary** arithmetic.

```
a.  01010111
  + 00110011
    --------
```

```
b.  00100110
  + 01001111
    --------
```

```
c.  01010011
  + 10111011
    --------
```

```
d.  01011100
  + 00011111
    --------
```

```
e.  10011011
  - 00111011
    --------
```

```
f.  01011001
  - 00011111
    --------
```

11. Perform the following **octal** arithmetic.

```
a.  424
  + 163
    ---
```

```
b.  5112
  + 1346
    ----
```

12. Perform the following **hexadecimal** arithmetic.

```
a.  A4
  + 27
    --
```

```
b.  7F3
  + 41D
    ---
```

```
c.  806
  -  4B
    ---
```

```
d.  56C
  - 1FF
    ---
```