

Note: you should also include the homework questions when reviewing for the exam.

Fill out the following chart:

| Base 10 | Base 2 | Base 16 | Base 10 | Base 2 | Base 16 |
|---------|--------|---------|---------|--------|---------|
| 0 | | | 8 | | |
| 1 | | | 9 | | |
| 2 | | | 10 | | |
| 3 | | | 11 | | |
| 4 | | | 12 | | |
| 5 | | | 13 | | |
| 6 | | | 14 | | |
| 7 | | | 15 | | |

Convert the following from base 10 into base 2 & base 16:

15

73

Convert the following from base 2 into base 10 & base 16:

0111 0101

0010 1001

Convert the following from base 16 into base 2 & base 10:

14

AC

8. Convert the following signed decimal numbers into 2 complement binary & hex equivalents 8pts.

-123_{10}

-321_{10}

Convert the following BCD to base 10:

1011 1101

1110 1101

Perform the following long multiplication: $1010\ 0111_2 \times 1101_2$

Perform the following long division: $1011\ 1110_2 \div 101_2$

Describe the IEEE-754 format for a 32 bit float. When might it be better than using a 16:16 rational (that using 16 bits for a numerator & a denominator - not the same as fixed point)? When might it be worse? Give an example of each.

What marks the end of a 7-bit string? What are the pros & cons of the 7-bit string format?

What is the net effect of right shifting a binary value?
What is the difference between right shift & arithmetic right shift?
Why might we need arithmetic right shift (hint, try it w/ a negative 2's complement number)?

Describe the virtual machine concept. Does it refer to software or hardware? Explain your answer.

Compare & contrast ASCII with EBCDIC.

What does packing & padding refer to? What are the tradeoffs involved with using them?

Give an example of software where direct use of assembly language is a good solution. Give an example of software that is not suited being coded directly in assembly. Justify your answers.