

Your Name: Version a Key
Section Time/Section #: 1
Your TA's Name: _____

CS 221 Computer Science for Engineers	Fall 2011
In-Class Quiz 1	
4 October 2011	Version a

- Write your Name and Section Number/Time on this page (top-right corner).
 - Write all your answers **NEATLY** on this paper.
 - Answer all parts of all questions. If you need more space, use the back of the page, but indicate that you have done so!
 - Calculators may **NOT** be used.
 - You have 30 minutes.
1. Convert the following decimal numbers to binary (base 2) representation. Show your work, or you will not get credit. The first one is done for you as an example.

$$79 = 64 + 8 + 2 + 1 = 1001011$$

$$(a) \ 129 = 128 + 1 = 10000001$$

$$(b) \ 778 = 512 + 256 + 8 + 2 = 1100001010$$

2. Convert the following binary numbers to decimal representation. Show your work, or you will not get credit. The first one is done for you as an example.

$$10101 = 16 + 4 + 1 = 21$$

$$(a) \ 100101 = 32 + 4 + 1 = 37$$

$$(b) \ 101110001 = ~~128~~ + 256 + 64 + 32 + 16 + 1 = 369$$

3. Write down the number of significant digits in each of the following. If it cannot be determined, write "can't tell":

$$(a) \ 0.00035 \quad \underline{2}$$

$$(b) \ 10001.0 \quad \underline{6}$$

$$(c) \ 6.751 \times 10^{15} \quad \underline{4}$$

$$(d) \ 167 \quad \underline{3}$$

4. Suppose you are solving a problem based on the equation $z^2 = x^3 - y^2 - xy \sin \theta$, using Excel. The cells A2, A3, and A4 contain given values of x , y , and θ , respectively. In the space below, write down exactly what you would type in cell B5 so that it displays the correct value of z for the given x , y and θ . Assume the value of θ is in radians. You may use any form of reference you like.

$$= (A2^3 + A3^2 - A2 * A3 * \sin(A4))^{0.5}$$

or $= \text{SQRT}(A2^3 + A3^2 - A2 * A3 * \sin(A4))$

5. Suppose cell F10 in an Excel worksheet contains the expression:

`=IF(AND(D5<=100,D5>50),D5,"")`

What would Excel display in cell F10 (after the spreadsheet is recalculated) if the value in cell D5 is:

- (a) 75.01 75.01
 (b) 1.23E-5 " " (nothing)

6. Assume cells in an Excel worksheet have the following contents:

A1: 2
 B1: 5
 C1: =A1*B1
 A2: 3
 B2: 10

Suppose now that you Copy the contents of C1 and Paste them into cell C2. What will be displayed in cell C2?

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7. Circle the value that is closest to the largest positive (double-precision) floating point value that can result from a calculation in MATLAB:

- (a) -1.79769e+308
 (b) 9999999999999999.999999999999
 (c) 0.00000000000001
 (d) 2.22507e+308
 (e) 1.79769e-308

8. Assume the following lines have already been typed at the MATLAB command prompt (indicated by >>):

```
>> a = 10;  
>> b = 2;  
>> c = 3;
```

Write down the output you would expect to see if you now type the following:

- (a) $d = c^b + a$

$$d = 19 \quad (\text{i.e., } 3^2 + 10)$$

- (b) $a + b * c$

$$\text{ans} = 16 \quad (\text{i.e., } 10 + (2 * 3))$$

9. Write down the output you would expect from the following command (assume variables have the same values as in the previous problem):

```
if a <= b && c > b  
    a = a - b  
else  
    b = a + b  
end
```

$$b = 12$$

10. Write a MATLAB conditional ("if") command that prints "YES" if the value of the variable score exceeds 90, "MAYBE" if the score is greater than 50 but not greater than 90, and "NO" otherwise. (Assume score has already been given a value. Recall that the disp() function prints its argument.)

```
if score > 90  
    disp('YES')  
elseif score > 50  
    disp('MAYBE')  
else  
    disp('NO')  
end
```