Computer Systems Architecture

http://cs.nott.ac.uk/∼txa/g51csa/

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Thursday quiz

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Most of the following questions are multiple choice. There is at least one correct choice but there may be several. For each of the questions list all the roman numerals corresponding to correct answers but none of the incorrect ones.
Questions are marked as follows:

no errors	5 points
1 error	3 points
2 errors	1 point
$\geq$**3 errors**	0 points

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1. What re the real numbers ($\mathbb{R}$)?
   a. Floating point numbers represent real numbers exactly.
   b. Real numbers are always fractions.
   c. π is a real number.
   d. $\sqrt{2}$ is not a real number.
   e. $\sqrt{-1}$ is not a real number.

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2. What is 1.11_2 in decimal?

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3. Which of the following statements about IEEE754 (floating point standard) single precision floating point numbers are correct?
   a. The exponent is represented using a bias of 127.
   b. The exponent is represented in sign and magnitude.
   c. The word consisting of 32 ones represents the largest representable number.
   d. The word consisting of 32 ones is $+\infty$.
   e. The word consisting of 32 ones is Not a Number.

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4. How do we *round to even*?
   a. $0010.11 \approx 0010$
   b. $0010.11 \approx 0011$
   c. $0011.10 \approx 0100$
   d. $0010.10 \approx 0010$
   e. $0001.01 \approx 0010$

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5. Given s (sign), e exponent, m mantissa, how do we calculate the value of a normalized single precision floating point number?

a. $(-1)^s \times 1.m \times 127^e$
b. $(-1)^s \times 0.m \times 2^{e-127}$
c. $(-1)^s \times 1.m \times 2^{e-127}$
d. $(-1)s \times 1.m \times 2^e$
e. $(-1)^s \times m \times 2^{e-127}$