Examples on Scientific Notation and Floating Point Representation

Which is the best example of a number written in scientific notation?

- ○ 12.5×10^{2}
- ○ 0.5×10^{5}
- ○ 5.367×10^{-3}
- ○ 0.1254

Which of the following is 0.00670 meter in correct scientific notation?

- ○ $6.7 \times 10^{+3}$
- ○ $0.67 \times 10^{+2}$
- ○ 0.67×10^{-2}
- ○ 6.7×10^{-3}

The diameter of the Hydrogen atom is 28.9×10^{-11} and the diameter of the Oxygen atom is 346×10^{-12}. If two atoms, one of each, are placed side-by-side, what is the resultant diameter?

- ○ 635×10^{-12}
- ○ 7.35×10^{-10}
- ○ 6.35×10^{-10}
- ○ 0.735×10^{-9}

The binary value (base 2) of the decimal (base 10) number 25.750 is:

- ○ 11101.011
- ○ 11000.11
- ○ 11001.11
- ○ 10111.11

As per IEEE-754 standard, the mantissa of the floating-point representation of $(+3.375)_{10}$ is

- $1111\ 0000\ 0000\ 0000\ 0000\ 000$
- $1011\ 1000\ 0000\ 0000\ 0000\ 000$
- $1011\ 0000\ 0000\ 0000\ 0000\ 000$
- $1.0110\ 0000\ 0000\ 0000\ 0000\ 00$

As per IEEE-754 standard, the exponent of the floating-point representation of $(-128)_{10}$ is:

- 132
- 134
- 130
- 128

A hypothetical computer stores floating point numbers in 16-bit words. The first bit is used for the sign of the number, the next seven bits are used for the biased exponent, and the next eight bits for the normalized mantissa. The machine epsilon is

- 2^{-8}
- 2^{-7}
- 2^{-1}
- 2^{-16}

You wrote a code to find the value of $\sin\ x$, the code calculated $\sin\ 0.5\ =\ 0.47916$, (0.5 is in RAD). The Absolute Error (AE) and Relative Error (RE) of the code are:

- AE: $2.6\ \times\ 10^{+4}$ RE: $5.4\ \times\ 10^{-2}\ \%$
- AE: $2.6\ \times\ 10^{-4}$ RE: $5.4\ \times\ 10^{-2}\ \%$
- AE: $2.6\ \times\ 10^{-5}$ RE: $5.4\ \times\ 10^{-2}\ \%$
- AE: $0.26\ \times\ 10^{-3}$ RE: $5.4\ \times\ 10^{-2}\ \%$