# Multiple-Choice Test

# Chapter 01.05
# Floating Point Representation

1.  A hypothetical computer stores real numbers in floating point format in 8-bit words. The first bit is used for the sign of the number, the second bit for the sign of the exponent, the next two bits for the magnitude of the exponent, and the next four bits for the magnitude of the mantissa. The number $e \cong 2.718$ in the 8-bit format is
    (A) 00010101
    (B) 00011010
    (C) 00010011
    (D) 00101010

2.  A hypothetical computer stores real numbers in floating point format in 8-bit words. The first bit is used for the sign of the number, the second bit for the sign of the exponent, the next two bits for the magnitude of the exponent, and the next four bits for the magnitude of the mantissa. The number that $(10100111)_2$ represented in the above given 8-bit format is
    (A) -5.75
    (B) -2.875
    (C) -1.75
    (D) -0.359375

3.  A hypothetical computer stores floating point numbers in 8-bit words. The first bit is used for the sign of the number, the second bit for the sign of the exponent, the next two bits for the magnitude of the exponent, and the next four bits for the magnitude of the mantissa. The machine epsilon is most nearly
    (A) $2^{-8}$
    (B) $2^{-4}$
    (C) $2^{-3}$
    (D) $2^{-2}$

4.  A machine stores floating point numbers in 7-bit word. The first bit is used for the sign of the number, the next three for the biased exponent and the next three for the magnitude of the mantissa. The number $(0010110)_2$ represented in base-10 is
    (A) 0.375
    (B) 0.875
    (C) 1.5
    (D) 3.5

5.      A machine stores floating point numbers in 7-bit words. The first bit is stored for the sign of the number, the next three for the biased exponent and the next three for the magnitude of the mantissa. You are asked to represent 33.35 in the above word. The error you will get in this case would be
        (A)  underflow
        (B)  overflow
        (C)  NaN
        (D)  No error will be registered.

6.      A hypothetical computer stores floating point numbers in 9-bit words. The first bit is used for the sign of the number, the second bit for the sign of the exponent, the next three bits for the magnitude of the exponent, and the next four bits for the magnitude of the mantissa. Every second, the error between 0.1 and its binary representation in the 9-bit word is accumulated. The accumulated error after one day most nearly is
        (A)  0.002344
        (B)  20.25
        (C)  202.5
        (D)  8640

For a complete solution, refer to the links at the end of the book.