

Answer:

A. Encode the (negative) decimal fraction $-9/2$ to binary using the 8-bit floating-point notation.

i. The first step is to convert the decimal fraction to binary.

$-9/2 = -4.5$, which in binary is 100.1 .

ii. The next step is to normalize the mantissa. This means that we need to move the binary point to the left until the first bit is a 1.

In this case, we need to move the binary point one bit to the left, which gives us 0.1001 .

iii. The sign bit is 1 because the number is negative. The exponent is 0 because the binary point is not moved more than one bit to the right.

The final encoding is 1001001 .

B. Determine the smallest (lowest) negative value which can be incorporated/represented using the 8-bit floating-point notation.

i. The smallest negative value that can be represented in 8-bit floating-point notation is -1 . This is because the sign bit is 1 and the exponent is the minimum value of -127 .

C. Determine the largest (highest) positive value which can be incorporated/represented using the 8-bit floating-point notation.

The largest positive value that can be represented in 8-bit floating-point notation is 1 . This is because the sign bit is 0 and the exponent is the maximum value of 127 .