ASSIGNMENT - 4

1. Consider a 7-bit floating point representation based on the IEEE floating point format. There is a 1 bit sign. 3-bit exponent, 3-bit fractional. Fill in the following encodings for some interesting numbers.

Solution:

Description	Binary Encoding
Zero	0 000 000
Smallest Positive (nonzero)	0 000 001
Largest denormalized	0 000 111
Smallest positive normalized	0 001 001
One	0 011 000
Largest finite number	0 110 111
NaN	0 111 001
Infinity	0 111 000

2. Consider a 8 bit floating point representation with a 3-bit significand, 4-bit exponent, a sign bit, and a bias value = 7. The implementation supports the IEEE-754 standard. Fill in the empty cells in the following table.

Solution:

Description	Value	s	exponent	significand
zero	0.0	0	0000	000
closest positive to zero	(-1)^0(0+⅛)*2^(-6)	0	0000	001
largest positive	(-1)^0(0.875)*2^7	0	1110	111
-5	-5.0	1	1001	010