

Name Answers

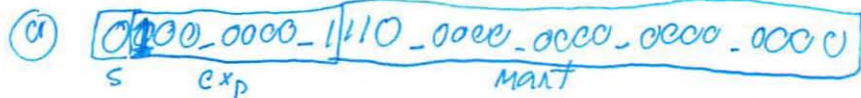
CE-1901 - Dr. Durant - Quiz 9
Fall 2015, Week 10 Quiz

1. (5 points) In binary, multiply $A=0101$ by $B=1101$, showing all 4 properly shifted intermediate products. Calculate the overall sum, showing the correct number of output bits needed to handle the largest possible product. In decimal, confirm whether your results agree with $5 \times 13 = 65$

$$\begin{array}{r}
 0101 \\
 \times 1101 \\
 \hline
 0101 \\
 0000 \\
 0101 \\
 0101 \\
 \hline
 01000001_2 = 64 + 1 = 65 \checkmark
 \end{array}$$

2. (5 points) Interpret $0x00E00000$ as a single-precision IEEE 754 floating point number...

- 1.5 a. Write the value in binary and box in the sign, exponent, and mantissa
1.5 b. Calculate 2^{exponent} after accounting for the bias.
1 c. Write the complete binary fraction based on the mantissa and convert it to a decimal fraction.
1 d. Multiply the contributions of the sign, exponent, and mantissa to arrive at the decimal value.



(b) $\text{exp} = 129$
 $\text{bias} = 127$
 $\text{exp really } 2$
 $\therefore 2^2 = \boxed{4}$

(c) $1.1100\ 0000\dots = 1 + \frac{1}{2} + \frac{1}{4} = 1\frac{3}{4} = 1.75$
 \uparrow
implicit 1

(d) $+1 \times 4 \times 1.75 = 7$