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Topic.....Date.....

Q4

a) mul = 25%

div = 35%

	mul	div
0.4	0.25	0.35

$$\frac{\text{Perf new}}{\text{Perf old}} = \frac{1}{(1-f) + \frac{f}{p}}$$

Theoretical max when mul, div take 0%

$$\frac{\text{Perf new}}{\text{Perf old}} = \frac{1}{0.4} = 2.5$$

b) A = 4GHz

B = 3.5GHz

$$\text{CPU Time A} = IC \times CPI_A \times \frac{1}{CR}$$

$$= I \times 2 \times \frac{1}{4 \times 10^9} = \frac{I}{2 \times 10^9}$$

$$\text{CPU Time B} = I \times 1.5 \times \frac{1}{3.5 \times 10^9} = \frac{3I}{2.8 \times 10^9}$$

∴ B is faster by 1.165 times A

Teacher's Sign.....

Bhat Kern 2018A7PS1119P

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Topic..... Date.....

Q2. No because the smallest value is $\pm 1.0 \times 2^{-126}$
2^{-127} would be exponent 0 and fraction 0 which would just be the representation of 0
Yes in denormalized
0 0000 0000 100...
=> 0x 00400000 //

Q3

a) An example of this can be address calculation where addresses are not negative.

b) when storing, it doesn't matter whether the data is signed or unsigned (it is just a string of bits) but like loading which can be sign extended in some specific way.

c) False, when ever occurs, address will be PC copied to EPC. Therefore, the program will return to the last int after exception occurs

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Topic Date

Q1.

x = 1 0 1 1 0 1 0 1 1 0 1 1

Exponent of x = 10000010 = 130

removing bias = 130 - 127

= 3

Exponent of y = 01111111 = 127

removing bias = 127 - 127

= 0

significand of y (lower exponent) is shifted right by 3

significand of y: 0.001 ... 11000101

Summing the 2 mantissa

$$\begin{array}{lll} & 1.1011 \ldots & 00001 \\ + & 0.0001 \ldots & 11000\ 101 \\ & 1. & \quad 101 \\ & 1.1100 \ldots & 11001 \end{array}$$

G,R

Guard, round, and extra bits are more than half so round up

= 1.1100 ... 11010

no renormalization needed

result: 0 10000010 1100 11010

Teacher's Sign