

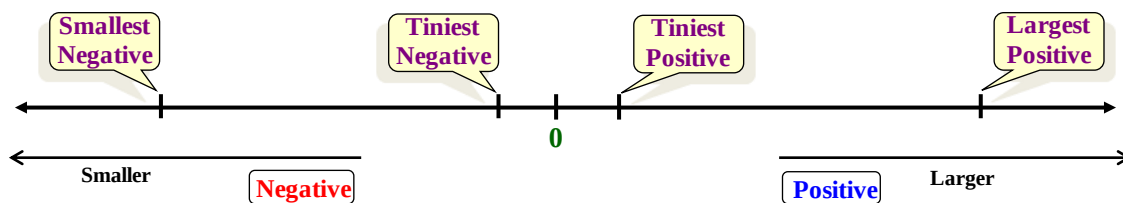
CS286-Computer Organization & Architecture

Quiz Question List (Quiz #6)

for October 7th, 2026

The following is a list of possible questions for our quiz on October 7th. Some of the questions will not be asked in the quiz. All the questions that will appear in the quiz will appear exactly as shown below (however, numeric parameters may be changed). The quiz is closed textbook, closed notes and closed neighbors. Note that the questions, which did not appear in this quiz, still may appear in the exams. You will find a solution for these questions during lectures.

- #1: In IEEE-754 floating-point number standard, if all the “exponent bits” are “1” (i.e., eight “1”s), what can it mean?
- #2: Translate $+262.75_{(10)}$ in the normalized binary format (as a decimal number). Show your work.
- #3: What does “normalization” in IEEE-754 standard mean?
- #4: What is the advantage of using “normalized” format in IEEE-754 standard?
- #5: Show the binary bit pattern for $+262.75_{(10)}$ in IEEE-754 format. Show your work.
- #6: Show the binary bit patterns for the tiniest positive number in IEEE-754 floating point numbers.



- #7: Show the binary bit patterns for the tiniest negative number in IEEE-754 floating point numbers (for the definition of “the tiniest negative”, use the definition in #7).
- #8: Show the binary bit patterns for the largest positive number in IEEE-754 floating point numbers (for the definition of “the tiniest positive”, use the definition in #7).
- #9: Show the binary bit patterns for the smallest negative number in IEEE-754 floating point numbers (for the definition of “the smallest negative”, use the definition in #7).

#10: What are the five different types of the numbers IEEE-754 floating-point numbers that can not be accurately represented by a processor?

Note: This question does not ask descriptions of the five different types of the numbers. Instead, it asks the name of the five different types of the numbers.

***** PROCESSOR DATAPATH *****

#11: What are the five basic steps in a processor datapath?

#12: What does “IF” stage in a processor datapath do?

#13: What does “ID” stage in a processor datapath do?

#14: What does “EX” stage in a processor datapath do?

#15: What does “ME” stage in a processor datapath do?

#16: What does “WB” stage in a processor datapath do?

#17: What is “PC (Program Counter)” register for?

#18: What does “CPI” stand for? What does it mean?

#19: What is “processor clock cycle”?

#20: What is “processor clock cycle time”?

#21: Show the formula to calculate the execution time (for scalar processors) using, IC (instruction count), R (clock cycle rate), and one more parameter.

#22: Processors with a lower clock rate execute the same binary programs faster than the processors with a higher clock rate. How is this possible?