Computer Organization Quiz 1 – chap 1.

3/11 15:00 ~ 15:10

80

True or False (10 pts / problem)

F 1. In 1998, mini-computers gradually disappear because supercomputers (server) arise and their super powerful computing capability makes mini-computers useless and not cost-effective.

T 2. Two representative design techniques to show the technical level of a country in the semiconductor area are the techniques of CPU design and ~~AI-accelerators~~ (memory) design.

T 3. Consider the CMOS technology in IC design, the power consumption of an IC increases as its clock frequency increases under keeping the other factors unchanged. And this is also the reason why the clock frequency of an IC cannot continue to raise highly.

T 4. Two designs of the same functionality have different die sizes. The chip with larger die size has lower yield and then the higher manufacturing cost to produce the same number of chips for sale.

F 5. Alice used to submit several programs at a time. For this kind of use model, a new computer running at a higher clock rate of 4.0GHz (originally running on 3.5GHz) has better performance than using another new computer with a quad-core CPU (originally CPU has single core) running at the same clock rate assuming that OS can submit 4 programs to 4 cores to perform the programs concurrently.

F 6. As increasing the clock rate of a CPU, we can also obtain the increasing performance of CPU.

F 7. Currently the reason why the power consumption of a CPU at idle state is pretty high is that we do not pay too much attention to lower its power consumption at idle state before. Once we decide to better this situation, we can design a CPU to consume no power at idle state.

T 8. A CPU requires 100 seconds to run a program, where 10 seconds for additions and 90 seconds for divisions. We can improve the division component design of the CPU to have a 10 times speedup on the same program.

F 9. The performance metric MIPS (million instructions per second) is a fair metric for comparing the performance of two computers using the RISC-based CPUs. 用一樣的演式可

T 10. Algorithms affect instruction count, and likely affect CPI.

F 11. Compilers affect instruction count, but do not affect CPI.