1. What are the benefits of dividing the computer operating architecture into seven layers for computer design?

2. Please try to explain what Moore's Law is and what impact does it have on the development of the computer industry?

3. Please refer to the development process of Intel microprocessors, and try to speculate that with the advancement of integrated circuit process technology, processors consume less and less power, but why do most processors need to use cooling fans?

4. What is a command set computer? How does such a concept help or benefit computer design?

5. According to the complexity of computer instruction sets, what are the two categories of computers?

6. Please explain the following terms: (1) Response time (2) Execution time (3) Throughput (4) Benchmark

7.Every three years, the number of transistors in the computer increases by 4 times, and the performance (speed) of the CPU is directly proportional to the internal transistors and the maximum clock frequency. In 1996, the x586/200 CPU contained 3 million transistors with a clock frequency of 200MHz. If an x1486/800 CPU with an 800MHz clock frequency is released in 2002, how many times faster will it be than x586/200?

8. The performance of a P microprocessor with 100 MHz was evaluated by executing 10,000,000 evaluation program instructions, and it was found that it took 0.25 seconds. What are the CPI and MIPS data during this performance experiment?

9. There is a 500MHz processor, and the following is the data obtained after measurement

|  |  |  |
| --- | --- | --- |
| Instruction set | CPI | frequency of use |
| A | 2 | 40% |
| B | 3 | 25% |
| C | 3 | 25% |
| D | 3 | 10% |

1. What is the MIPS of this processor, please?
2. What is the CPI of this processor, please?

10. What is the role of the Effectiveness Evaluation Process? What kind of problems may it face?

11. The program starts from completing the source code (source code) to produce the final execution result, what are the three periods (hierarchies)? What did each period do?

12. Please try to explain the program compilation period (compile time )What are the main tasks included? Why does a program have to go through this stage before it can be executed?

13. What is the biggest difference between direct and indirect addressing? For these two addressing instructions, how many memory accesses are required to extract the value that actually participates in the operation from the operator to the processor's register? How many times are there any accesses to the main memory?

14. What is the base addressing method (base addressing）？ Why is it often used for array access? Please give one An example of a 32-bit instruction illustrates this addressing pattern.

15.Please try to explain the five important eras of modern computer development and describe the characteristics of each generation.

16.It proves that the three factors of software, hardware structure, and hardware technology together affect computer performance.

17.Briefly describe the full execution cycle of each command, what phases should it include, and what does each phase do?