

不可攜帶計算機*

1. (15%) Explain what are the main differences between general-purpose processor, application-specific processor and single-purpose processor?
2. (10%) Explain what are the concepts of hardware/software partition and hardware/software co-design?
3. (15%) How SPARC window-based register file can be used to improve the performance of procedure call/return function? And what is the key point or main concept of this enhancement? If the number of windows is not enough for your program nested call, describe how SPARC faces this problem (what actions need to be performed during CALL and RETURN)?
4. (10%) What is the concept of memory hierarchy? Why we use the memory hierarchy in current computer architecture?
5. (15%) Explain the relation between data dependence and data hazard in a pipelined processor. Furthermore, explain how the forwarding technique is applied to solve the data hazards in a pipelined processor.
6. (10%) Please explain all the addressing modes in a MIPS processor.
7. (10%) Consider the Write operation in a cache system, explain the advantages and disadvantages between write-through and write-back.
8. (15%) Please state and prove that the Booth's algorithm can process the signed multiplication.