

Computer Design (0907432)

Homework 3

Submit Handwritten Solutions

- Problem 1:** (a) What are the three main problems of the first generation of VLIW processors?
(b) How these problems are solved in EPIC?

Problem 2: In the ILP limits study described in Chapter 3, what are the six assumptions on an ideal processor?

Problem 3: Why do the SPECFP applications have more ILP than the SPECINT applications?

Problem 4: Is it realistic to assume that in the coming few years engineers will be able to build processors that issue up to 64 instructions per cycle? Why?

Problem 5: Simultaneous Multithreading (SMT)

- Briefly describe the main features of an SMT processor.
- Why does the SMT processor have best processor resources utilization when compared with superscalar, fine-grained multithreading, and coarse-grained multithreading?
- Give one advantage and one disadvantage of giving equal priorities to all threads running on an SMT processor?

Problem 6: Draw the organization of the Power 5 processor's pipeline?

Problem 7: Draw the organization of the Sun UltraSPARC T2 multicore processor?

Problem 8: State the four classes in Flynn's taxonomy?

Problem 9: Draw typical organizations of centralized memory and distributed memory multiprocessors?

Problem 10: What are the two communication models in parallel architectures?

Problem 11: What are the two main challenges in parallel programming?

Problem 12: Give a definition for a coherent memory system?

Problem 13: Give a definition for write consistency?

Problem 14: Draw the state diagram of the write-back snoopy cache coherent protocol described in the class?