

ORDRE DES INGÉNIEURS DU QUÉBEC

MAI 2020 SESSION

Open-book examination
Calculators : only authorized models
Duration : 3 hours

14-IF-A3 COMPUTER ARCHITECTURE (100 points)

1. What type of memory is typically used to implement a level 1 and level 2 cache for a very fast processor and why a DRAM is typically not an option, explains the main reasons (10 points)
2. Explains how interleaved memory works, list the drawbacks, and the main reasons to implement it in a computer (20 points)
3. What is the purpose of a write buffer and what would be its impact on the performance of the system and the possible disadvantages of increasing its capacity: (20 points)
4. The terms LRU, FIFO, random are used in computer architecture to describe what, and describe how they work (20 points)
5. What is the advantages and disadvantages if any of using a write buffer for an instruction cache and why (10 points)
6. Explain how a split transaction works and when it is advantageous to use it (10 points)
7. How a cache memory can enhance the performance of a MIMD (10 points)