**Tutorial 09:** WRES1201 – Computer System Architecture

1. Give those characteristics distinguish RISC's organization.
2. Briefly describe 2 basic approach used to minimize operation register-memory in RISC machine.
3. List and briefly define three types of computer system organization.
4. What are the main characteristics of an SMP?
5. What is the difference between software and hardware cache coherent schemes?
6. What is the meaning of each of the four states in the MESI protocol?
7. What are some of the benefits of clustering?

**Homework**

1. Let α be the percentage of program code that can be executed simultaneously by *n* processors in a computer system. Assume that be remaining code must be executed sequentially by single processor. Each processor has an execution rate of *x* MIPS.
   1. Derive an expression for the effective MIPS rate when using the system for exclusive execution of this program in term of α, *n* and *x*.
   2. If n= 16 and x= 6 MIPS, determine the value of α that will yield a system performance of 54 MIPS.
2. *A program consists of five tasks, which have execution times of 2000, 4000, 6000, 8000 and 10,000 cycles. It is not possible to divide the execution of one task among multiple processors, but there are no communication or synchronization costs. If the task are distributed across the processor to achieve the shortest execution time, what is the speedup for executing the program on four processor?*