ENS1161 Computer Fundamentals

Module 2 – Tutorial / Revision Questions

1. Briefly describe the function of the following components of a computer:
    a. ALU
    b. Register array
    c. Control Unit
    d. Primary Memory
    e. Input / Output Unit

2. (a) What is a bus? Describe what it is (physical structure) and what it does.
   (b) Name the 3 components of a system bus and describe their function.

3. For the following internal processor registers, give the full name *(if only an acronym is given)*, and briefly describe what each one does:
    a. IR
    b. PC
    c. MAR
    d. Accumulator
    e. Address latch
    f. Data buffer

4. There is a control signal called R/$\overline{W}$. What do the symbols R, W and the $\overline{\ }$ (bar symbol) mean? Describe the function of this control signal with records to primary memory.

5. List and describe the sequence of actions carried out by the processor during an instruction fetch.

6. Explain what happens when the processor decodes an instruction. Include details of all components involved and their function.

7. What is an instruction set?

8. What happens during the execution phase of an instruction cycle?

9. ** The fetch-decode-execute cycle described has the PC being incremented by 1 each time. This would men that the program instructions would be read and executed sequentially, but most programs are not just sequential.
   How would the processor be able to handle non-sequential program instructions (e.g. loops)? Explain what you think would / could happen.

** *Note*: Not covered explicitly in this module. Requires some thinking / research – will be covered in future modules.