

## ECP2046 Computer Organization and Architecture

### SOLUTION FOR TUTORIAL 2

Q1. iac, if, iod, oac, of, oac, of, do

The states involved in any given instruction cycle can be described as follows:

- Instruction Address Calculation (iac): Determines the address of the next instruction to be executed - usually adding a fixed number to the address of the previous instruction.
- Instruction fetch (if): Read instruction from its memory location into the CPU.
- Instruction Operation Decoding (iod): Analyse instruction to determine type of operation to be performed and operand(s) to be used.
- Operand Address Calculation (oac): If the operation involves reference to an operand in memory or available via I/O, then determine the address of the operand.
- Operand Fetch (of): Fetch the operand from memory or read it in from I/O.
- Data Operation (do): Perform the operation indicated in the instruction.
- Operand Store (os): Write the result into memory or out to I/O.

Q2. See the following figure for an example of program execution where the contents of the memory word at address 940<sub>16</sub> are added to the contents of the memory word at address 941<sub>16</sub> and the result stored in the latter location.

