

P1)

a) The existing blocks (if any) that can be used for this instruction are:

- 1) Instruction Memory which reads the instruction from the PC.
- 2) Both registers are used to read the ports in order to read the values of the registers Rd & Rs .
- 3) ALU which adds the registers Rd & Rs to determine the address of the memory.
- 4) Data Memory which will retrieve the data from the specified address.
- 5) It used write ports in the registers to load data from the memory to the target register.

= Instruction memory, Registers, ALU, and Data Memory

b) The LWI instruction loads the data from the memory. Then retrieves that memory address by adding the Rd & Rs register values. The specified data is then loaded from the memory to register Rt . This feature requires only instruction-memory read register ports, registers, data memory & ALU.

= New functional blocks are not required

c) There are no new signals needed for the instructions. Since for the implementation of LWI instruction, the existing blocks are enough. It is possible to execute the instruction without any external control signals. The control logic requires changes.

= No additional control unit signals are needed