

Quiz 2B Solution

رقم الشعبة: 2

الرقم التسلسلي:

الاسم:

Instructions: Time **10** minutes. Closed books and notes. No calculators. Please answer all problems in the space provided. **No questions are allowed.**

<Good Luck>

For the following instruction sequence, use the multi-cycle pipeline diagram to find how many cycles needed to execute this sequence on the classical 5-stage pipeline described in Section 4.6. Assume that the pipeline solves data and control hazards through stalling, no forwarding paths are available except through the register file, and branches are resolved in the decode stage.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----|
| lw R2,0(R1) | F | D | E | M | W | | | | | | | |
| add R4,R2,R5 | | F | D | D | D | E | M | W | | | | |
| sw R4,0(R1) | | | F | F | F | D | D | D | E | M | W | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Number of cycles is 11 Cycles

You get five marks for correct number of cycles.

You get five marks for correct pipeline diagram. You lose one mark for each error in the pipeline diagram.