

0917432 Computer Architecture and Organization 2 (Spring 2024)

Quiz 1B

الشعبة:

رقم التسجيل:

الاسم:

Instructions: Time **15** minutes. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. No questions are allowed.

P1. A company produces electronic chips on a 300-mm diameter silicon wafer. After the manufacturing process, each wafer undergoes a testing procedure to classify chips as either good (functional) or bad (defective). On one particular wafer, it was found that there were 1200 good chips and 300 bad chips. Find the yield for this wafer.

<2.5 marks>

$$\begin{aligned} \text{Yield} &= 1200 / (1200 + 300) \\ &= 1200 / 1500 = 4 / 5 \\ &= 80\% \end{aligned}$$

P2. Consider a 5-stage pipelined processor discussed in class that resolves data hazards by introducing stalls. The only forwarding mechanism available is through the Register File, where results written can be read in the same cycle. Utilize the multi-cycle pipeline diagram provided below to illustrate how this processor processes the given instruction sequence. Assume that branch instructions are resolved in the decode stage.

<2.5 marks>

Instruction	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ld x1, 0(x4)	F	D	E	M	W										
sub x5, x2, x3		F	D	E	M	W									
add x6, x1, x7			F	D	D	E	M	W							
bne x6, x0, L1				F	F	D	D	D	E	M	W				

<Good Luck>