

# 0907432 Computer Design (Spring 2019)

## Quiz 2

رقم الشعبة: 1

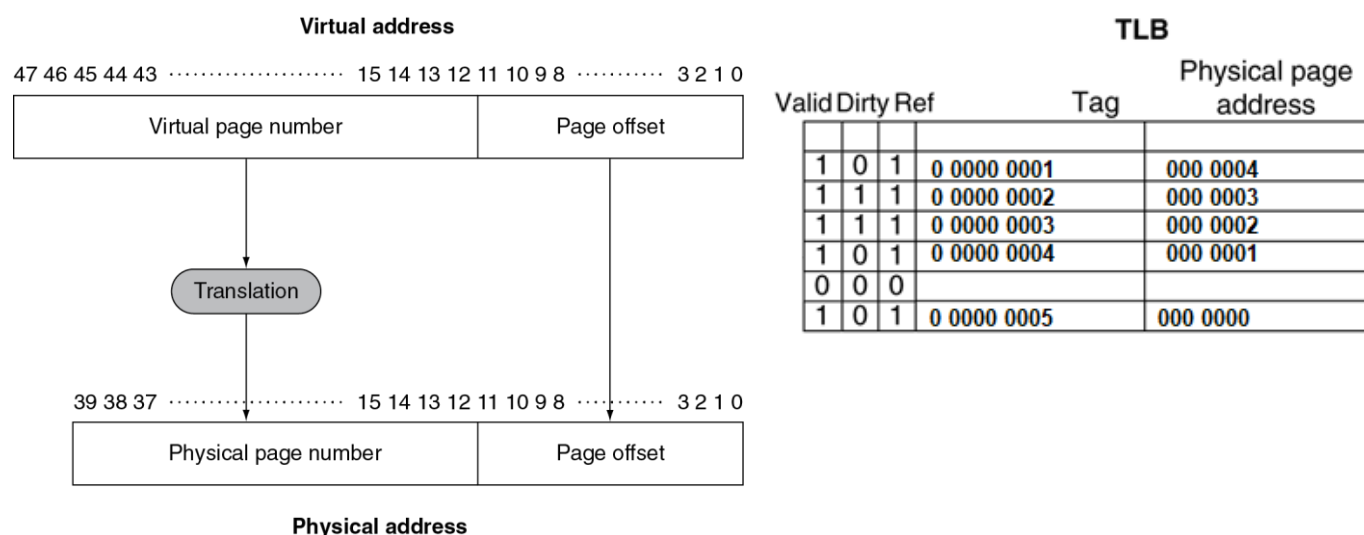
رقم التسجيل:

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.**

*<Good Luck>*

**P1.** Given the following details about virtual memory address translation and the TLB contents,



a) What is the translation of the virtual address 0000 0000 2135<sub>h</sub> (all numbers are hexadecimal)?

**The solution is:**

**Page offset is 135<sub>h</sub>**

**Virtual page number is 2, which is a hit in the second TLB entry.**

**The physical page number is 000 0003**

**The physical address is 00 0000 3135<sub>h</sub>**

b) What is the addressed page (code, read only data, or read/write data page)?

**The solution is:**

**Since the dirty page is set, the page must be read/read data.**

**P2.** What is the expected speedup of converting a serial program to a parallel program that runs on 4 processors? Assume that the parallelizable fraction is 80%.

**The solution is:**

$$\begin{aligned}\text{Speedup} &= 1 / ( (1-f) + f/s ) \\ &= 1 / ( 0.2 + 0.8/4 ) \\ &= 1 / ( 0.2 + 0.2 ) \\ &= 1 / 0.4 \\ &= 2.5\end{aligned}$$