CSCC85 Tutorial Quiz #2

Solutions

Name:
Student Number:
Tutorial:  TUT0001 (11 am)  TUT0002 (12 pm)  (circle one)

(1) [3 marks] Write a sequence of instructions to store the value FFh in external data at memory location 19A3h.

\[
\begin{align*}
\text{MOV} & \quad \text{DPTR, } #19A3h ;\text{copy the address of the xdata memory location to DPTR.} \\
\text{MOV} & \quad \text{A, } #FFh ;\text{copy the value we want to store in external data into A.} \\
\text{MOVX} & \quad @\text{DPTR}, \text{A} ;\text{copy the value in A to the address pointed to by DPTR in XDATA.}
\end{align*}
\]

(2) [3 marks] Write a sequence of instructions to read Port 0 and write a status condition to bit 0 of Port 3 as follows: If the number read from Port 0 is even, write a 1 to the output status bit, otherwise write a 0.

\[
\begin{align*}
\text{MOV} & \quad \text{C, P0.0} ;\text{copy the LSB of port 0 to the carry bit} \\
\text{CPL} & \quad \text{C} ;\text{P0.0=0 => P0 is even, compliment bit} \\
\text{MOV} & \quad \text{P3.0, C} ;\text{write result to status bit}
\end{align*}
\]

(3) [4 marks] Which bit-addresses would be set to 1 by the following sequence of instructions?

\[
\begin{align*}
\text{MOV} & \quad 25h, #13h ;\text{copy the number #13h into byte address 25h} \\
& \quad ;(\text{overlaps bit addresses 28-2Fh}) \\
\text{MOV} & \quad \text{R0, } #22h ;\text{copy the number #22h into register 0,} \\
\text{MOV} & \quad \text{R0}, 25h ;\text{use register indirect, copy the contents of byte memory address 25h} \\
& \quad ;\text{to byte address #22h, ie #13h (overlaps bit addressed 10-17h)}
\end{align*}
\]

Convert the number (13h) which is copied into byte (overlapping bit) memory into binary:

\[13h = 0001 \ 0011\]

Thus mapping this value onto bit memory (see memory diagram) we see that bit addresses 2Ch, 29h, and 28h are set by the first instruction, and bit addresses 14h, 11h, and 10h are set by the last instruction.