**CSE 3215: Microcontroller Based System Design**

**Assignment 1**

**Time: 20 minutes**

**Marks: 10**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | State the contents of the RAM locations in 8051 after the following program.   |  | | --- | | SETB PSW.3 | | SETB PSW.4 | | MOV R3, #12H | | MOV R5, #13H | | MOV R6, #10H | | MOV R7, #20H | | MOV R1, #22H | | [1.5] |
| 2. | Analyze the stack for the LCALL instructions in the following program.   |  |  |  |  | | --- | --- | --- | --- | | 0000 |  | ORG | 0 | | 0000 | 7455 | BACK: | MOV A,#55H | | ………. | F590 |  | MOV P1,AFB | | ………. | FB22 |  | MOV R3,#22H | | ………. | 7A25 |  | MOV R2,#25H | | ………. | 120300 |  | LCALL DELAY | | ………. | 74AA |  | MOV A,#0AAH | | ………. | F590 |  | MOV P1,A | | ………. | 120300 |  | LCALL DELAY | | ………. | 80EC |  | SJMP BACK | |  |  |  |  | | 0500 |  | 0RG | 500H | | ………. | C003 | DELAY: | PUSH 3 | | ………. | C002 |  | PUSH 2 | | ………. | 7BFF |  | MOV R3, 0FFH | | ………. | 7AFF | NEXT: | MOV R2, 0FFH | | ………. | DAFE | AGAIN: | DJNZ R2, AGAIN | | ………. | DBFA |  | DJNZ R3, NEXT | | ………. | D002 |  | POP2 | | ………. | D003 |  | POP3 | | ………. | 22 |  | RET | | ………. |  |  | END | | [4] |
| 3. | Write the instructions required to add -7 and -4. Show the value of the status register’s V, N, S and P flags. | [1.5] |
| 4. | Find the ROM memory address, on-chip ROM in bytes and ROM organization of each of the following AVR chips.  ATtiny32  ATmega256 | [3] |