Mid-Term Tips

# General

* C1,2,4,5 (3 is NOT coming out)
* Set by Mr.Loh, great teacher = great questions = we GG, so please **prepare like no tomorrow**
* Tips enough to pass, GitHub notes prepare you for A- and above, your own notes prepare you for A. 100 marks, pray to god.

# Theory

* C1: Definition of Bit
* C2: Conventional vs BCD
* C4: 3 components of CPU, Volatile vs non-volatile memory, 3 types of buses lines, 3 types of registers. Machine cycle. CISC & RISC, Advantages.
* C5: All the debug commands functions & parameters:
  + A
  + U
  + R
  + D
  + E
  + T
  + P
  + Q
  + H
  + C

### Burn this into your brain

* If question ask **LOAD** means write **FETCH + LOAD + END** contents. If **FETCH** then **FETCH** + **END** contents.

|  |  |  |
| --- | --- | --- |
| **FETCH** | | |
| PC -> MAR | | |
| MDR -> IR | | |
| **LOAD** | **STORE** | **ADD/MUL/DIV/SUB** |
| IR[Address] -> MAR | | |
| MDR -> A | A -> MDR | A +\*/- MDR -> A |
| **END (Applies to all)** | | |
| PC + 1 | | |

# Practical

## Perform conversion from decimal to hexa.

### Practice

**6258\_10 to hex**

6258

391 – 2

24 – 7

## Two’s Complement

### Practice

Using 8-bit system, Perform binary subtraction using two’s comeplement, verify answer by showing answer in signed decimal value.

**15-23**

0000 1111 (15)

0001 0111 (23)

1st: 110 1000

2nd complement: 1110 1001

1110 1001 (-23)

1111 1000

-128+64+32+16+8 = -8

15-23 = -8

Valid.

(Hae multiply, plus and minus)

## Excess-N Floating Point

Excess-55 floating point, 1 for negative, 9 for positive.

Multiply 2 numbers,

95234577

15557890

52 + 55 – 55 = 52

0.34577 \* 0.57890 = 0.20017 (can round up cause 5 digits ennough)

Positive \* negative = negative

15220017

Sign and magnitude

-0.20017 \* 10^-3

## How to change decimal to binary

## IEEE 752

## LMC (Little man computer)

### Trace instruction (Practice)

4. Show changes of contents in IR, PC, MAR, MDR, A. Execution instruction 22 nd 23

PC: 22

Value in mem loc 22: 670 (LOAD)

Val in mem loc 23 271 (MUL)

Val in mem loc 24: 470 (STORE)

Val in mem loc 70: A\_16

Val in mem loc 71: 5\_16

|  |  |
| --- | --- |
| Instruction 22 | Registers |
| PC -> MAR | MAR: 22 |
| MDR -> IR | IR: 670 |
| IR address -> MAR | MAR: 70 |
| MDR -> A | A: A16 |
| PC = PC+1 | PC: 23 |
| Instruction 23 | Registers |
| PC -> MAR | PC: 23 |
| MDR -> IR | IR: 271 |
| IR[address] -> MAR | MAR: 71 |
| A \* MDR -> A | A: 32H |
| PC = PC + 1 | PC = 24 |
|  |  |

CISC, RISC, Bus

## Debug:

### Practice

5. Issue DEBUG command for these instruction

a. Execute 10 instructions at once

**-t 10**

P=10, 0200 (cannot use P becaues need offset)

b. Display content of memory at CS starting from offset 0100H

**-d CS:0100**