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ECE 375 HW2

1 Give the sequence of micro operations for the fetch and execute cycles of the call label.

Fetch:

1. MAR<-PC
2. MDR<-M(MAR), PC<-PC+1
3. IR(high) <-MDR
4. MAR<-PC
5. MDR<-M(MAR), PC<-PC+1
6. IR(low) <-MDR
7. MAR<-PC
8. MDR<-M(MAR), PC<-PC+1
9. TEMP(high)<-MDR
10. MAR<-PC
11. MDR<-M(MAR), PC<-PC+1
12. TEMP(low)<-MDR

Execute:

1. MDR<-PC(high)
2. MAR<-SP
3. M(MAR)<-MDR, SP<-SP-1
4. MDR<-PC(low)
5. MAR<-SP
6. M(MAR)<-MDR, SP<-SP-1
7. PC<-TEMP

2 Give the sequence of micro operations for the fetch and execute cycles of the ret label.

Fetch:

1. MAR<-PC
2. MDR<-M(MAR)
3. IR(high) <- MDR, PC<-PC+1
4. MAR<-PC
5. MDR<-M(MAR)
6. IR(low) <- MDR, PC<-PC+1

Execute:

1. SP<-SP+1
2. MAR<-SP, MDR<-M(MAR)
3. PV(high)<-MDR, SP<-SP+1
4. MAR<-SP, MDR<-M(MAR)
5. PC(low)<-MDR

3Examine code from lab 5 and answer questions.

1. The two 16 bit values being multiplied are: 0108 and 1414
2. After lines 11-25 the first time
   1. LAddr:20
   2. LAddr+1:00
   3. LAddr+2:00
   4. LAddr+3:00
3. After lines 11-25 the second time
   1. LAddr:20
   2. LAddr+1:04
   3. LAddr+2:00
   4. LAddr+3:00
4. After lines 11-25 the third time
   1. LAddr:20
   2. LAddr+1:04
   3. LAddr+2:32
   4. LAddr+3:00
5. After lines 11-25 the fourth time
   1. LAddr:20
   2. LAddr+1:04
   3. LAddr+2:32
   4. LAddr+3:04

4 Write an avr assembly subroutine that implements XOR.

Xor = ~(~ p and ~ q) and ~(p and q)

XOR:

Mov r3, r1;

Mov r4, r2;

Mov r5, r1;

Mov r6, r2;

Com r3

Com r4

And r3, r4

Com r3

And R5, r6

Com r5

And r3 r5

Ret

4a. The stack will contain the return address after rcall is done. The return address is placed on the stack with low byte first

|  |
| --- |
| 0xff |
| 0x01 |