ECE3073 Computer Systems

Practice Questions

NIOS Assembler

i) For the NIOS processor give the common use of the following registers:

a) r0 …… 

b) r1 ……

c) r32 ……

ii) Which NIOS processor register contains the interrupt enable bit?

…… 

Which bit in the register is the interrupt enable bit?

…… 

iii) In NEOS machine code instructions which bits contain the op-code?

…… 

iv) In a NIOS assembler branch instruction the 16-bit immediate constant contains which of the following? (mark the correct answer with a cross)

a) an unsigned byte offset ……..
b) an unsigned word offset ……..
c) a signed byte offset ……..
d) a signed word offset ……..

v) In a NIOS assembler j type instruction such as jmpi the IMM26 26-bit immediate constant contains which of the following? (mark the correct answer with a cross)

a) a byte offset ……..
b) a word offset ……..
c) a byte address ……..
d) a word address ……..

vi) The NIOS assembler instruction sub rA, rB, rC performs which operation? (mark the correct answer with a cross)

a) rA = rB – rC ……
b) rC = rA – rB ……
a) rC = rB – rA ……

vii) In Neos assembler what is the difference between:

stw r4, 0(r5) **and**
stwio r4, 0(r5)

viii) Convert the following Nios machine code instructions to assembler.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	0	1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0

Instruction	operands

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	1	1	0	0	0	0	0	0	1	1	1	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1	0

Instruction	operands

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	1	0	0	1	0	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	1	1	0	0

Instruction	operands

Q4.3 (6 marks) Convert the following Nios assembler code instructions to machine code (write your answers in the boxes provided).

Instruction	operands
mul	r6, r12, r1

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Instruction	operands
jmpi	0x87654320 /* this instruction is at address 0x80000000 */

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Instruction	operands
srli	r9, r3, 6

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

RAR March 3 2012