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0304-1659294

LMS HANDLING ALSO

Questions No 01

10 marks

a) Write the instructions for 0-address machine to evaluate the following expression.

$$z = x^2 + y^2 + 2xy$$

Note: x, y and z represent memory locations.

Answer:

0-address instruction

PUSH x
PUSH x
MUL
PUSH y
PUSH Y
MUL
ADD
PUSH x
PUSH y
MUL
PUSH 2
Push x
MUL
Push y
ADD
POP z

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EXPLAIN:

FIRST we PUSH Two Time X and Then we MUL its mean X raise to power 2

Then Same as for Y Then Add its mean $x^2 + y^2$ and then Push 2 and X then Mult the push Y Then Add and in Last we will Pop Z

NOTE: EXPLAIN IS NOT NECESSARY Just For Concept I explain

- b) Calculate the execution time for 0-address machine using the above given expression by considering the following parameters:

6	2 GHz
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Answer:

Execution Time = $IC \times CPI \times T$

Where	IC= Instruction count CPI = average number of system clock periods to execute an instruction
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T = clock period

Putting the given value

ET = $14 \times 6 \times 2$ ET= 16

Questions No 02

10 marks

Reverse assemble the following SRC machine language instructions:

a) B2064000h

Answer:

B2064000h

First we convert hexadecimal into binary which is:

1011 0010 0000 0110 0100 0000 0000 0000

The first 5bits of binary represent the opcode which is 2. This opcode 22 represent to "or" instruction which is a D instruction of SRC. The format of D instruction is:

31	27	26	22	21	17	16	12	11	0
Op-code	ra	rb	rc	Unused					

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In D instruction, the first five bits represent opcode, and next 15 bits represent the one destination and two source operands of 5-bits each. We split the given bit pattern according to the type-D instruction format as following:

Next, we specify the instruction field for each the section as following:

10110	01000	00011	00100	000000000000
Or	R8	R3	R4	Unsed

Hence, the SRC instruction will be: or,R8,R3,R4

b) 1A0C0022h

Answer:

1A0C0022h

First we convert hexadecimal into binary which is:

0001 1010 0000 1100 0000 0000 0010 0010

The first 5bits of binary represent the opcode which is 3. This opcode 3 represent to "st" instruction which is a C instruction of SRC. The format of C instruction is:

31	27	26	22	21	17	16	0
Op-code	ra		rb		c2		

Next, we specify the instruction field for each the section as following:

00011	01000	00110	00000000000100010
St	R8	R6	34

Hence, the SRC instruction will be: st,R8,R6,34