

Date:

Assignment # 4. Digital Logic Design

Q1

DA - 3 bits to select the register.	R4
AA - 3 bits to select the register for Bus A	R1
BA - 3 bits to select the register for Bus B or MUX B	R3
MB - 1 bit to select b/w register data or const.	register
FS - 4 bits to control the ALU operation	addition
MD - 1 bit to select B/W ALU output	output
RW - 1 bit to enable register writing.	write

(a) $R4 \leftarrow R1 + R3$

DA	AA	BA	MB	FS	MD	RW
100	001	011	0	0010	0	1

Binary = $(1000010110001001)_2$

1000	0101	1000	1001
2^3	2^2 2^1	2^3	2^3 2^0
8	5	8	9

Hexadecimal = $(8589)_{16}$

(b) $R3 \leftarrow \text{Data in}$

DA	AA	BA	MB	FS	MD	RW
011	000	000	0	0000	1	1

Binary = $(0110000000000011)_2$

0110	0000	0000	0011
2^2 2^1			2^1 2^0
6	0	0	3

Hexadecimal = $(6003)_{16}$

(c) $R1 \leftarrow SI R4$

DA	AA	BA	MB	FS	MD	RW
001	000	100	0	1110	0	1

Binary = $(0010001000111001)_2$

0010	0010	0011	1001
2^1	2^1	$2^1 2^0$	$2^3 2^0$
2	2	3	9

Hexadecimal = $(2239)_{16}$ (d) $R3 \leftarrow 0$

DA	AA	BA	MB	FS	MD	RW
011	000	000	0	1010	0	1

Binary = $(0110000000101001)_2$

0110	0000	0010	1001
$2^2 2^1$		2^1	$2^3 2^0$
$4+2$			$8+1$
6	0	2	9

Hexadecimal = $(6029)_{16}$