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Student : Name:_____ Roll No._____ Section:_____

Question 1 a [8]

Using four bit number, multiply 6 x 5 using original multiplier circuit (without optimization) discussed in the class. Value of each register is initialized in the table below. List different steps that will be performed in each iteration and the resulting value of each register.

Iteration	Step	Multiplier	Multiplicand	Product
0	Initial values	0101	00000110	00000000
1				
2				
3				
4				

Question 1 b [4]

Bits have no inherent meaning. Given the bit pattern
0000 0000 0010 0110 0000 1000 0000 0010

a. **Assuming it as a MIPS instruction identify source and destination register numbers.**

b. **Assuming it as a signed binary value, what is the corresponding integer value?**

Question 2 [8]

Input	Present State		Next state	
x	**A_i**	**B_i**	**A_{i+1}**	**B_{i+1}**
0	0	0	1	0
0	0	1	0	1
0	1	0	1	0
0	1	1	0	1
1	0	0	0	0
1	0	1	1	1
1	1	0	0	0
1	1	1	0	0

The state table shows the transitions of a sequential circuit with two memory elements.
a) Write down the Boolean expressions describing the next state.
b) Draw the circuit using the expressions.