Student Registration Number:	EEE104

EEE104 – Digital Systems - Interim Test 2009

Answer All questions by writing the answer in the appropriate box provided

1 Write down the value for A B C D that will satisfy the Boolean expression below.

$\overline{A.B.\overline{C}.\overline{D}} = 0$

A	**B**	**C**	**D**

2 Complete the following Boolean expressions:

(where A' represents NOT A)

i. A + 1 =

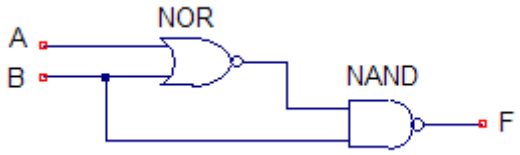
ii. A + A' =

iii. A + A =

iv. A + 0 =

3 Express the decimal number -39 as an eight bit binary 2's complement number.

4 Complete the truth table for the circuit below.



A B	**F**
0 0	
0 1	
1 0	
1 1	

5 Write down the dual of the expression X**.**0 = 0

(duality principle)

6 Complete the truth table for the 2-to-1 multiplexer given by:

S	Y
0	A
1	B

where S is the select line,

A,B are the data inputs

Y is the output

S A B	**Y**
0 0 0	
0 0 1	
0 1 0	
0 1 1	
1 0 0	
1 0 1	
1 1 0	
1 1 1	

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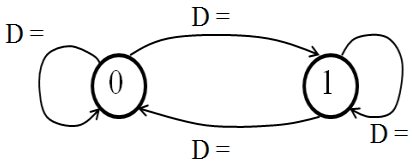
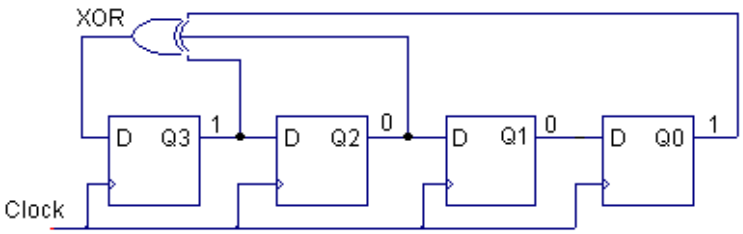
7	What binary number is represented by the hexadecimal number DA	
8	Express the function *F(A,B) = A **XNOR** B* as a fundamental product of sums.	
9	Complete the truth table for a half adder with inputs A and B	
10	Complete the state diagram for a D-Type flip-flop, by filling in the D input values on the directed lines.	
11	What is the frequency in MHz of a clock waveform that has a pulse width of 10ns and a duty cycle of 20%	
12	The linear feedback shift register shown below is in the state 1001. What will the new stable state be after the next **two** clock pulses have been applied?	Q3 = Q2 = Q1 = Q0 =

A B	**SUM**	**CARRY**
0 0		
0 1		
1 0		
1 1		





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