Quiz No. Two

Student Name: .....

Student ID: .....

Question #	***Points***
1	
2	
3	
4	
Total	

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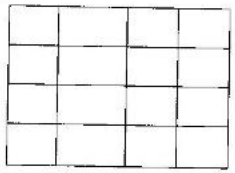
Quiz No. Two

(1) Find all minimum expressions (sum of products and product of sums) for the following function (that is, using K-map, circle the terms on the map and write the algebraic expressions). (4.5 points)

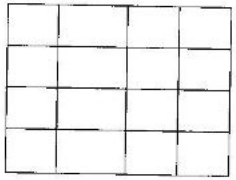
$F(a,b,c.d) = \sum m(0,2,4,6,10,11,15) + \sum d(8,14)$

Start Solution Here:

F



F'



F1=

F2=

F3=

F'=

F4=

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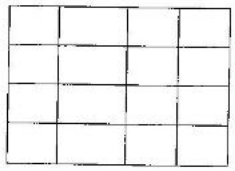
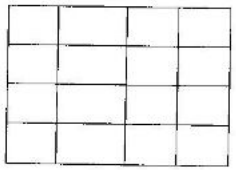
(2) Find all minimum sum of products expression(s) for the following functions (that is, using K-map, circle the terms on the map and write the algebraic expressions). (4.5 points)

(a) $F(a,b,c.d,e) = \sum m(0, 2, 4, 5, 12, 15, 18, 20, 22, 26, 28, 29, 30) + \sum d(8, 13, 14, 31)$

Start Solution Here:





F1=

F2=

F3=

F4=

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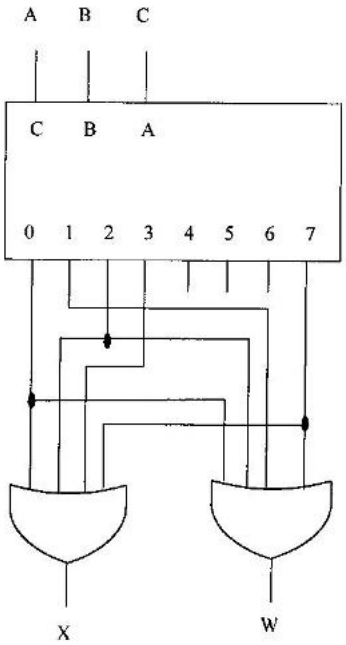
(3) Consider the following circuit with an active high output decoder.
Draw a truth table for X and W, then extract the switching formula for the design in terms of A, B and C. (3 points)



Start Solution Here:

Truth table

A	B	C	X	W

X(a,b,c) =

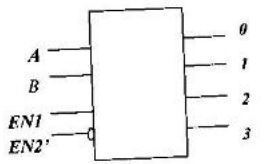
W(a,b,c)=

---

(4) Consider the following three functions, f, g and h of the four variables, a, b, c and d, whose minimum solutions are listed below.

$$f(a,b,c,d) = b'c'd + bc + abd$$
$$g(a,b,c,d) = c'd + b'd + b'c$$
$$h(a,b,c,d) = ac + cd' + a'c'd + bd$$

Implement them using, only, decoders of the type shown (as many as needed) and three ***OR*** gates. No other gates are allowed, logic *1* and logic *0* are available. All variables are available both complemented and uncomplemented. (8 points)



EN1	*EN2'*	*A*	*B*	*0*	*1*	*2*	*3*
0	*X*	*X*	*X*	*0*	*0*	*0*	*0*
X	*1*	*X*	*X*	*0*	*0*	*0*	*0*
0	*1*	*0*	*0*	*1*	*0*	*0*	*0*
0	*1*	*0*	*1*	*0*	*1*	*0*	*0*
0	*1*	*1*	*0*	*0*	*0*	*1*	*0*
0	*1*	*1*	*1*	*0*	*0*	*0*	*1*

Start Solution Here: