SECR1013 DIGITAL LOGIC QUIZ 2 (SET 2)

TIME: 30 MINUTES

16/18

Instruction: Please answer the following objective questions in answers table on the last page.

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Section:	3

1. Given the rules of Boolean Algebra, which of the following expressions is equivalent to $A + AB$. (1M)

   A. B
   B. A
   C. $A + B$
   D. $A.B$

2. Solve this Boolean Expression $\overline{A\bar{C} + B\bar{D}}$? (2M)

   A. $(AC + \bar{B})\bar{D}$
   B. $A\bar{C} + \overline{BD}$
   C. $ABCD$
   D. $(AC)(\bar{B} + D)$

   $= \overline{A\bar{C}} \cdot \overline{B\bar{D}}$
   $AC \cdot \overline{B\bar{D}}$
   $AC \cdot \bar{B} + D$

3. Which of the following is the CORRECT answer for the simplification of this Boolean expression? (2M)

   $X = ABC + BC + A(B + C)$

   A. $X = AB + BC$
   B. $X = AB + AC + BC$
   C. $X = AC + A + BC$
   D. $X = A$

   $ABC + BC + AB + BC$
   $ABC + BC + AB$
   $B(AC + C) + AB$
   $BC + AB$

   $A + AB = A$
   $C + CA = C$

4. Which of the following is the CORRECT truth table for this Boolean expression? (2M)

   $X = A\bar{C} + A(C + 1) + BC$

   SOP

   $A + 1$
   $\bar{A} = 0$
   $A \cdot 0 = 0$
   $A \cdot 1 = A$
   $A + 0 = A$
   $A + 1 = 1$
   $A + \bar{A}B$
   $= A + B$

A.

A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

B.

A	B	C	X
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

$A\bar{C} + AC + A + BC$

$A\bar{C} + A + BC$

$A + BC$

C.

A	B	C	X
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

D.

A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

5. Determine which Boolean expression is POS. (1M)

A. $\overline{ABC} + \bar{A}BC$

B. $(B + \bar{C} + D)(\bar{A} + B)$

C. $AB\bar{C}D + A\bar{C} + \bar{B}C$

D. $(A + C)\overline{(B + D)}$

6. Convert the following Boolean expression to standard POS. (2M)

$$F = (A + B + C)(A + C)(B)$$

A. $F = (A + B + C)(A + \bar{B} + C)(A + \bar{B} + \bar{C})(\bar{A} + B + C)(\bar{A} + B + \bar{C})$

B. $F = (A + B + C)(\bar{A} + \bar{B} + C)(A + \bar{B} + \bar{C})(\bar{A} + \bar{B} + C)(\bar{A} + B + \bar{C})$

C. $F = (\bar{A} + \bar{B} + \bar{C})(A + \bar{B} + C)(A + B + \bar{C})(\bar{A} + B + C)(\bar{A} + B + \bar{C})$

D. $F = (A + B + C)(A + \bar{B} + C)(A + B + \bar{C})(\bar{A} + \bar{B} + C)(\bar{A} + \bar{B} + \bar{C})$

7. Represent the following KMAP using pi notation π. (2M)

AB \ CD	00	01	11	10
00	0	0	1	1
01	0	1	1	0
11	1	1	0	1
10	1	1	1	0

A. π_{ABCD} (0, 1, 4, 6, 11, 15)

B. π_{ABCD} (0, 1, 4, 6, 10, 15)

C. π_{ABCD} (0, 1, 4, 5, 10, 15)

D. π_{ABCD} (0, 1, 4, 6, 10, 14)

8. Determine how many groups are created for the following SOP KMAP. (2M)

AB \ CD	00	01	11	10
00	1	0	0	1
01	0	1	1	0
11	1	1	1	1
10	1	0	0	1

A. 2

B. 3

C. 4

D. 5

9. Get the minimum SOP expression for KMAP below. (2M)

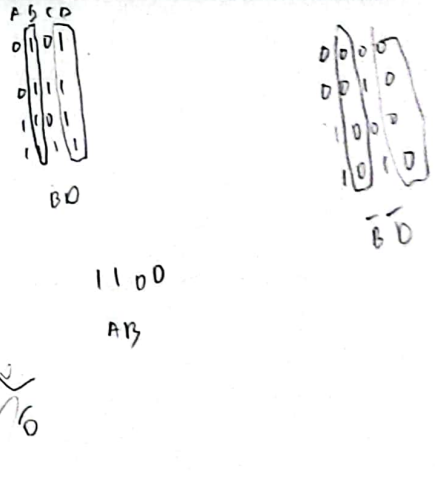
AB \ CD	00	01	11	10
00	1	0	0	1
01	0	1	1	0
11	1	1	1	1
10	1	0	0	1

A. $\bar{B}\bar{D} + AB + \bar{B}\bar{D}$

B. $\bar{B}\bar{D} + A\bar{B} + BD$

C. $BD + AB + BD$

D. $\bar{B}\bar{D} + AB + BD$



10. Get the minimum POS expression for KMAP below. (2M)

A \ BC	00	01	11	10
0	0	1	0	X
1	0	1	1	X

A. $\bar{A}B + \bar{C}$

B. $(\bar{A} + B)(\bar{C})$

C. $A\bar{B} + C$

D. $(A + \bar{B})(C)$

Answers Table:

1. B	2. D	3. A	4. A	5. B
6. D	7. B	8. B	9. D	10. D