CMPT333 HOMEWORK 1

Created	@Jan 31, 2020 11:23 AM
Materials	Homework 1 CMPT.pdf
Reviewed	☐

Problem 1

p q	p AND q	p NOR r	p === q
0 0	1	1	1
0 1	1	0	0
1 0	1	0	0
1 1	0	0	1

Problem 2a

p q	p → q	NOT p OR q	E
0 0	1	1	1
0 1	1	1	1
1 0	0	0	1
1 1	1	1	1

Problem 2b

p q r	r OR NOT p	q → a	p → b
0 0 0	1	1	1
0 0 1	1	1	1
0 1 0	1	1	1
0 1 1	1	1	1
1 0 0	0	1	1
1 0 1	1	1	1
1 1 0	0	0	0
1 1 1	1	1	1
Untitled			

Problem 2c

p q	p OR q	p AND q	(p OR q) → (p AND q)
0 0	0	0	1
01	1	0	0
10	1	0	0
0	1	1	1
Untitled			
Untitled			

Problem 3

Exclusion

Problem 4

(p NAND q) NAND r

0 . 0 . 1 = 0

p NAND (q NAND r)

0 0 . 1 . = 1

(p → q) → r = 0

0 . 0 . 0

p → (q → r)

0 . 0 . 0 . = r

(p NOR q) NOR r

0 . 0 . 1 . = 0

p NOR (q NOR r)

0 . 0 . 1 . = 1

Problem 5

p q	p AND q	FALSE
0 0	0	0
0 1	0	0
1 0	0	0
1 1	1	0

- There a 4 functions that do not depend on two arguments

Problem 6

pq	False	AND	!-->	p	p-->q	q	XOR	OR	NOR	===	!q	q-->p	!p	p-->q 1	NAND	TRUE
00	0	0	0	0	o	0	0	0	1	1	1	1	1	1	1	1
01	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
10	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
11	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Untitled																

Problem 7

p XOR q === qXOR p

(p XOR q) XOR r === p XOR (q XOR r)

1 1 0 === 1 1 0

+ truth table? -2

Problem 8

a = !p!qr+ p!q!r+p!qr+pq!r+pqr

b = !p!q!r+ !p!qr+!pq!r

Problem 9

a = (p+q+r) * (p+!q+r) * (p+!q+!r) //Where a = 0, opposite values

b = (!p+q+r)*(p+!q+!r)*(p+!q+r)*(p+q+!r)*(p+q+r)

Problem 10

a	00	01	11	10
00	0	1	1	1
01	1	1	1	1
11	1	1	0	1
10	1	1	1	1

Problem 11/12 (p!q!r+(q!r)+(!ps)+!pr!s+p!qr)

a	00	01	11	10
00	0	1	1	1
01	1	1	1	1
11	1	1	0	1
10	1	1	1	1

Problem 13/14((!p+!q!+!r+!s)*(p+q+r+s)

a	00	01	11	10
00	0	1	1	1
01	1	1	1	1
11	1	1	0	1
10	1	1	1	1

Problem 10

b	00	01	11	10
00	1	1	1	1
01	1	1	0	1
11	1	0	0	0
10	1	1	0	1

Problem 11/12(!p!r+!p!qr+!pr!s+p!q!s+p!q!r+p!r!s)

b	00	01	11	10
00	1	1	1	1
01	1	1	0	1
11	1	0	0	0
10	1	1	0	1

Problem 13/14 ((p+q+s)*(p+q+r)*(p+r+s)*(q+r+s)

b	00	01	11	10
00	1	1	1	1
01	1	1	0	1
11	1	0	0	0
10	1	1	0	1

Problem 10

c	00	01	11	10
00	0	1	0	1
01	1	0	1	1
11	0	1	1	1
10	1	0	1	0

Problem 11/12(pqs+qrs+pqr+prs+p!q!r!s+!pq!r!s+!p!q!rs+!p!qr!s)

c	00	01	11	10
00	0	1	0	1
01	1	0	1	0
11	0	1	1	1

c	00	01	11	10
10	1	0	1	0

Problem 13/14((!p+!q+!r+!s)*(!r+!s+p+q)*(!r+s+!p+q)*(!r+s+p+!q)*(r+s+!p+!q)*(r+!s+!p+q)*(r+!s+p+!q)

c	00	01	11	10
00	0	1	0	1
01	1	0	1	0
11	0	1	1	1
10	1	0	1	0

Problem 10

d	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	1	1	1	0
10	1	1	1	1

Problem 11/12(!p+p!r+prs+pq!r)

d	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	1	1	1	0
10	1	1	1	1

Problem 13/14(p+q+r+s)

d	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	1	1	1	0
10	1	1	1	1

Problem 10

e	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	0	0	0	0
10	1	1	0	0

Problem 11/12 (!p+p!q!r)

e	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	0	0	0	0
10	1	1	0	0

Problem 13/14 (r+p)*(!r+p+q)

e	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	0	0	0	0
10	1	1	0	0

Problem 16

a. pqr→p+q

p q r	pqr	p+q	E
0 0 0	0	0	1
0 0 1	0	0	1
0 1 0	0	1	1
0 1 1	0	1	1
1 0 0	0	1	1
1 0 1	0	1	1

p q r	pqr	p+q	E
1 1 0	0	1	1
1 1 1	1	1	1

b. ((p→q)(q→r))→(p→r)

p q r	p-->q	q-->r	p-->r	a AND b	E
0 0 0	1	1	1	1	1
0 0 1	1	1	1	1	1
0 1 0	1	0	1	0	1
0 1 1	1	1	1	1	1
1 0 0	0	1	0	0	1
1 0 1	0	1	1	0	1
1 1 0	1	0	0	0	1
1 1 1	1	1	1	1	1
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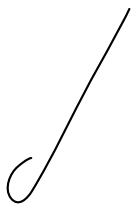
c. (p→q)→p

p q	p-->q	E
0 0	1	0
0 1	1	0
1 0	0	1
1 1	1	1
Untitled		

d. (p=(q+r))→(q→pr)

p q r	q + r	p=(q+r)	pr	q--> pr	E
0 0 0	0	1	0	1	1
0 0 1	1	0	0	1	1
0 1 0	1	0	0	0	1
0 1 1	1	0	0	0	1
1 0 0	0	0	0	1	1
1 0 1	1	1	1	1	1



p q r	q + r	p=(q+r)	pr	q--> pr	E
1 1 0	1	1	0	0	0
1 1 1	1	1	1	1	1
Untitled					