Problem 1.1 (B1)

$\bar{x}\bar{y}z + \bar{x}yz + x\bar{y}\bar{z} + xyz$

Problem 1.2 (B1)

$\overline{g(a,b,c)} = \overline{(\bar{a}+b+c)(a+\bar{b}+c)(a+b+\bar{c})}$

$= \overline{(\bar{a}+b+c)} + \overline{(a+\bar{b}+c)} + \overline{(a+b+\bar{c})}$

a	b	c	$\overline{g(a,b,c)}$
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$= (a\bar{b}\bar{c}) + (\bar{a}b\bar{c}) + (\bar{a}\bar{b}c)$

Problem 2.1 (B2)

a)
☐ DNF ☐ CNF ☑ Both ☐ Neither

b)
☐ DNF ☐ CNF ☐ Both ☑ Neither

c)
☐ DNF ☑ CNF ☐ Both ☐ Neither

d)
☐ DNF ☐ CNF ☐ Both ☑ Neither

Problem 2.2 (B2)

a)

Your work:

$(ab + \overline{bc})(\overline{de + h})$	
$(ab + \overline{bc})(\bar{d}\bar{e}\bar{h})$	DeMorgan's law
$(ab + \overline{bc})((\bar{d}+\bar{e})\bar{h})$	DeMorgan's law
$(ab + \bar{b}+\bar{c})((\bar{d}+\bar{e})\bar{h})$	DeMorgan's law
$(ab + \bar{b}+\bar{c})((\bar{d}+\bar{e})h)$	Double complement law
$(ab + \bar{b}+\bar{c})(\bar{d}h+\bar{e}h)$	Distributive law
$ab\bar{d}h + ab\bar{e}h + \bar{b}\bar{d}h + \bar{b}\bar{e}h + \bar{c}\bar{d}h + \bar{c}\bar{e}h$	Distributive law

Final answer:

$ab\bar{d}h + ab\bar{e}h + \bar{b}\bar{d}h + \bar{b}\bar{e}h + \bar{c}\bar{d}h + \bar{c}\bar{e}h$

b)

DNF ( ) + ( ) + ( )

(+)(+) CNF (+)(+)

Expressions	**Laws of Boolean Algebra**
$a\bar{c}e + ade + \bar{b}\bar{c}e + \bar{b}de$	Original Expression
$e(a\bar{c} + ad + \bar{b}\bar{c} + \bar{b}d)$	Distributive law
$e(a(\bar{c}+d) + \bar{b}(\bar{c}+d))$	Distributive law
$e((\bar{c}+d)a + \bar{b}(\bar{c}+d))$	Commutative law
$e((\bar{c}+d)a + (\bar{c}+d)\bar{b})$	Commutative law
$e(\bar{c}+d)(a+\bar{b})$	Distributive law

Final answer:
$e(\bar{c}+d)(a+\bar{b})$

$(x+y)(z+x)$

Problem 4 (B4)

a)

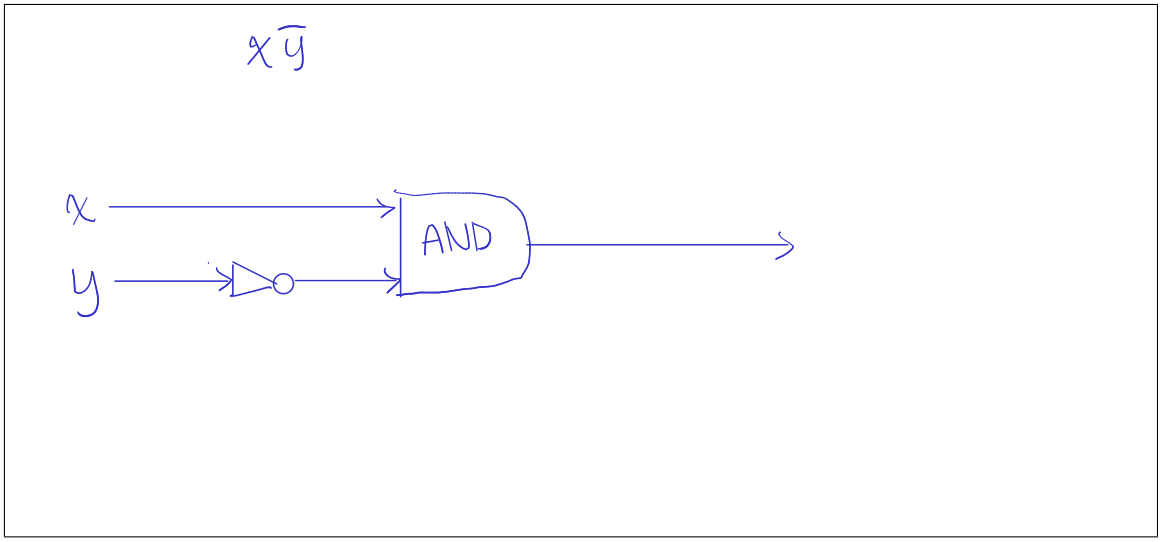
$(AE \cdot \overline{AT})(CT + CS)(DT \cdot DW) = 1$

b)

$(BE\overline{BT}\,\overline{BS}) + (\overline{B}EBT\overline{BS}) + (\overline{B}E\overline{B}TBS) = 1$

Problem 5.1 (B5)

x	y	$f(x,y)$
0	0	0
0	1	0
1	0	1
1	1	0



$x = x \uparrow y = 1$

x	y	$x \uparrow y$
0	0	1
0	1	1
1	0	1
1	1	0

Problem 5.2 (B5)

Original expression:
$\overline{(\bar{x} + \bar{y})}\,\overline{(\bar{y} + z)}$

Expressions	**Laws of Boolean Algebra**
$\overline{(\bar{x} + \bar{y})}\,\overline{(\bar{y} + z)}$	Original Expression
$(\bar{\bar{x}}\,\bar{\bar{y}})(\overline{\bar{y} + z})$	Demorgan's law
$(\bar{\bar{x}}\,\bar{\bar{y}})(\bar{\bar{y}}\,\bar{z})$	Demorgan's law
$(x\,\bar{\bar{y}})(\bar{\bar{y}}\,\bar{z})$	Double complement law
$(xy)(\bar{\bar{y}}\,\bar{z})$	Double complement law
$(xy)(y\bar{z})$	Double complement law
$x(yy)\bar{z}$	Associative law
$xy\bar{z}$	Idempotent law