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Digital Logic Homework

chapter 1

9. 1110 1101 $= 2^7+2^6+2^5+2^3+2^2+2^0$

   0001 0011 $= \boxed{-19}$

11. 1111 1110 11 $= \boxed{3FB}$

14. 1111 1010 1011 $= 2^{11}+2^{10}+2^9+2^8+2^7+2^5+2^3+2^1+2^0$

    $= \boxed{4011}$

16. $\boxed{BABE}$

17. 1000 0111 0001

    0111 1000 1110 $= \boxed{-1935}$

19. $\boxed{-1024 \text{ to } +1024}$

20. 1111 0100 1110

    0000 101 10010 $= \boxed{-178}$

21. 2|2271 2|170

    2|1135 = 1 2|85 = 0

    2|567 = 1 2|42 = 1

    2|283 = 1 2|21 = 0

    2|141 = 1 2|10 = 1

    2|70 = 1 2|5 = 0

    2|35 = 0 2|2 = 1

    2|17 = 1 2|1 = 0

    2|8 = 1 0 = 1

    2|4 = 0

    2|2 = 0

    2|1 = 0

    0 = 1

    10001101111_2

    $\boxed{12 \text{ bits}}$

22. 1000 110 11111

    0111 0010 0001 $\boxed{0111\,0010\,0001_2}$

chapter 2

1. $A=0, B=1, C=1, D=0$

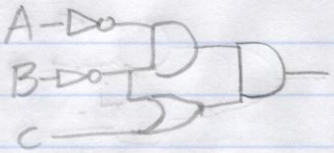
$\neg(A \vee B) \wedge (\neg B \vee C) \vee D$

$= \neg(0 \vee 1) \wedge (\neg 1 \vee 1) \vee 0$

$= (1 \wedge 0) \wedge (0 \vee 1) \vee 0$

$= (1 \wedge 0) \vee 0 \quad = \boxed{0}$

3. $\neg(A \vee B) \wedge (\neg B \vee C) = (\neg A \wedge \neg B) \wedge (\neg B \vee C)$



4.

A	B	C	$\neg A \wedge \neg B$	$\neg B \vee C$	$(\neg A \wedge \neg B) \wedge (\neg B \vee C)$
F	F	F	T	T	T
F	F	T	T	T	T
F	T	F	F	F	F
F	T	T	F	T	F
T	F	F	F	T	F
T	F	T	F	T	F
T	T	F	F	F	F
T	T	T	F	T	F

5. $A \wedge ((\neg B \vee (\neg C)) \vee (\neg C \wedge B)$

a) $A(\neg B) \vee A(\neg C) \vee (\neg C B)$

b) $(A \neg B) + (A \neg C) + (\neg C B)$

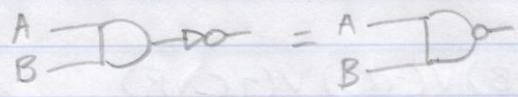
c) $A\bar{B} + A\bar{C} + \bar{C}B$

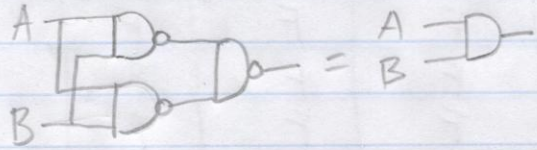
6. $A \wedge ((\neg B) \vee (\neg C)) \vee (\neg C \wedge B)$

	A B C	$(A \wedge (\neg B))$	$(A \wedge (\neg C))$	$((\neg C) \wedge B)$	$(A \wedge (\neg B)) \vee (A \wedge (\neg C))$	$(A \wedge (\neg B)) \vee (A \wedge (\neg C)) \vee ((\neg C \wedge B)$
T	F F F	F	F	F	F	F
F	F F T	F	F	F	F	F
T	F T F	F	F	T	F	T
F	F T T	F	F	F	F	F
T	T F F	T	T	F	T	T
F	T F T	T	F	F	T	T
T	T T F	F	T	T	T	T
F	T T T	F	F	F	F	F

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

9.

10. 

11. 

12.