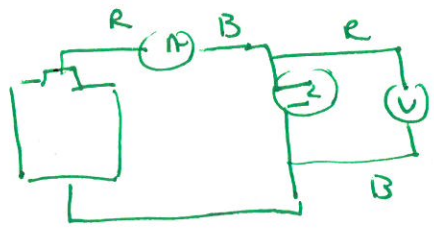


EM a, 10, 11, 12  
P1-5, 10, 11, 12

- 9 a (parallel) → (A) destroyed (V) OK
- 2 b (serial) → (A) reads 0 (V) OK

10 b  $V_1 = V_2$

11  
2



21

$$V_{pp} = 6 \text{ div} = 3 \text{ V}$$
$$\text{Amp} = 3 \text{ div} = 1.5 \text{ V}$$

5

$$V_{rms} = \frac{\text{Amp}}{\sqrt{2}} = 1.06 \text{ V}$$

$$T = 6 \text{ div} = 6 \text{ ms}$$
$$f = \frac{1}{T} = 167 \text{ Hz}$$

- 16
- a False
  - b True
- 2

P: 1-5, 10-12

HT 10.1-3, 10.14

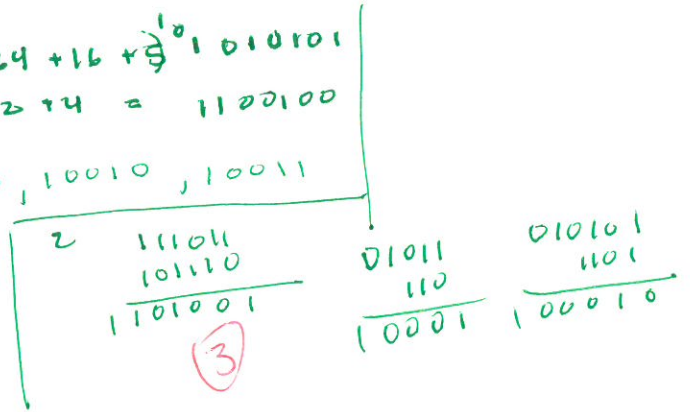
EM 9, 10, 11, 21

P1:  $28 = 16 + 8 + 4 = 11100$ ;  $100 = 64 + 32 + 4 = 1100100$

15, 16, 17, 18, 19  $\rightarrow$  01111, 10000, 10001, 10010, 10011

(17)

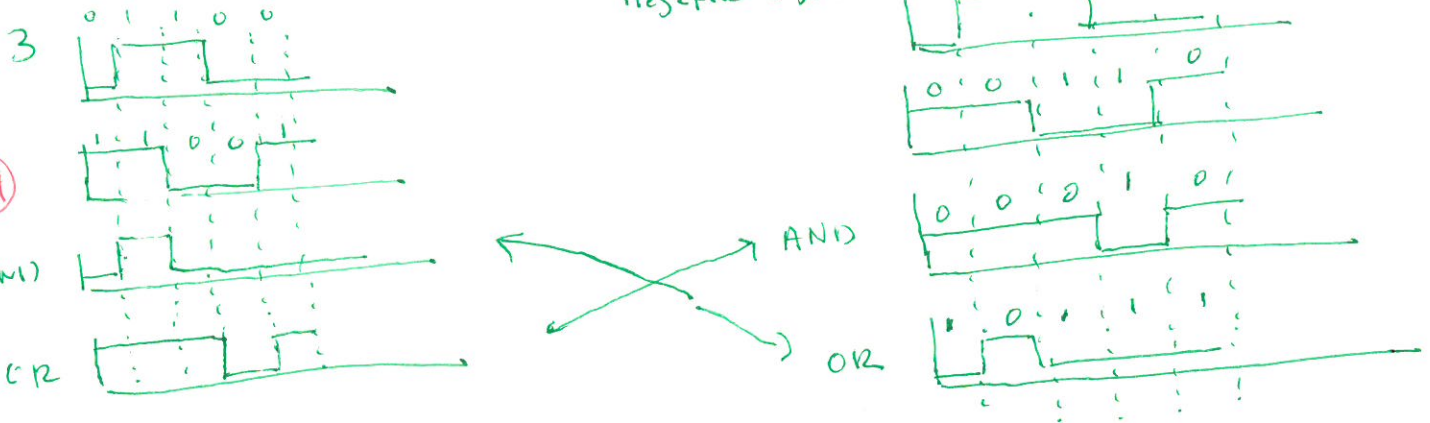
1100	10101010	1111	oct hex dec
15	252	17	
D	AA	F	
13	170	15	



365 = 0011, 0100, 0101

41 = 32 + 8 + 1 = 101001

negative logic

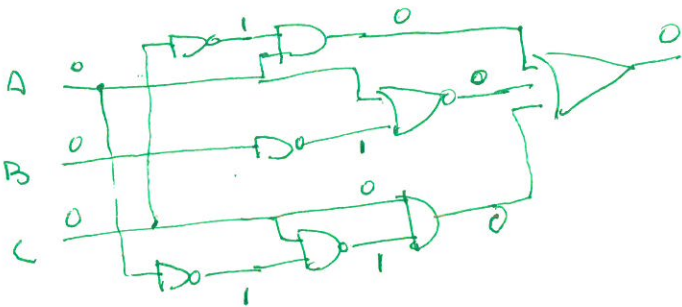


4  $A \cdot (C + D) + B \cdot E$

5  $A \cdot \bar{C} + \overline{A+B} + \overline{A \cdot C} \cdot C$

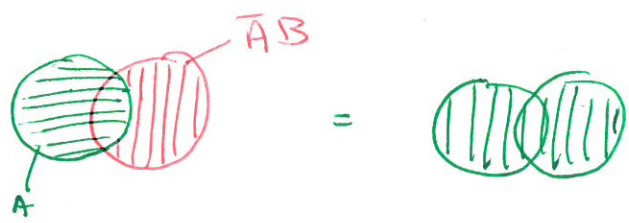
$= A \cdot \bar{C} + \bar{A} \cdot \bar{B} + (A + \bar{C}) \cdot C$

5  $= A \cdot (\bar{C} + C) + \bar{A} \cdot \bar{B} = A + \bar{A} \cdot \bar{B} = A + B$



2 10 - See Lab 0

11



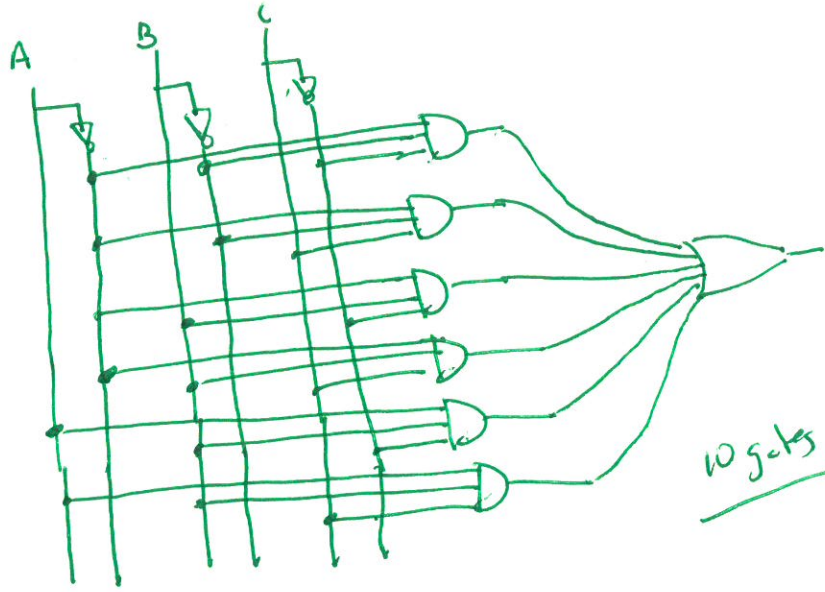
5

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

$$\begin{aligned}
 A + \bar{A}B &= A + A + \bar{A}B = A + A(B + \bar{B}) + \bar{A}B \\
 &= A + A\bar{B} + (A + \bar{A})B \\
 &= A(1 + \bar{B}) + 1 \cdot B \\
 &= A \cdot 1 + B = A + B
 \end{aligned}$$

$$\begin{aligned}
 &\bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C} + \bar{A}BC + \overline{\bar{A}B\bar{C}} + \overline{A\bar{B}C} \\
 &\quad \underbrace{\bar{A}\bar{B}} \quad \underbrace{\bar{A}B} \quad \underbrace{A\bar{B}} \\
 &\quad \underbrace{\bar{A}}
 \end{aligned}$$

$$= \bar{A} + AB = \overline{\bar{A} + B} = \overline{(A\bar{B})}$$



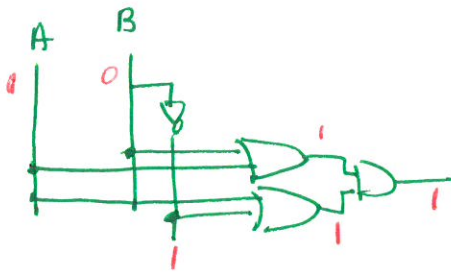
10 gates



2 gates

12

4



$$(A+B) \cdot (\bar{B}+A) = A\bar{B} + \overset{A}{A}A + B\bar{B} + BA$$
$$= A(\bar{B}+B) = A$$

HH 10.1

3/8

a)  $1110101.011$  } 117.375  
 $7 S_4 = 7 \times 16 + 5 = 117$

b)  $11.010101\dots = 3\frac{2}{3}$   
 $\frac{1}{4} + (\frac{1}{4})^2 + (\frac{1}{4})^3 + \dots = \frac{1}{1-r}$   
 $\frac{r}{1-r} \Big|_{r=\frac{1}{4}} = \frac{1/4}{3/4} = \frac{1}{3}$

c)  $2A = 2 \cdot 16 + 10 = 42$

a)  $1023 = 2^{10} - 1 = 1111111111$

b)  $1023 = 1000000100011$

a)  $2023 = 1111111111 = 3FF$

$101110101101$   
 B A D

$16 \overline{) 3840}$   
 $16 \overline{) 161453}$  (13) = D  
 $16 \overline{) 240}$  (0)  
 $16 \overline{) 15}$  (0)  
 (F)  
 FOOD

10.2

✓

$-3 = 101$   
 $2 = 010$   
 $\hline 000$   
 $101$   
 $\hline 1010$

$6 = 0110$   
 $\overline{6} = 1001$   
 $\overline{6} + 1 = 1010 \leftarrow (-6)$

10.3

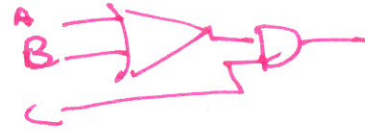
✓

$-5 = 1011$   
 $\overline{-5} = 0100$   
 $\overline{-5} + 1 = 0101 = 5$

4H 8.13  
ABC

	00	01	11	10
A	0	0	1	0
B	0	1	1	0

$$BC + AC = (A+B)C$$



8.17 AB x CD

	00	01	11	10
00	0	0	0	0
01	0	1	3	2
11	0	3	6	6
10	0	2	6	4

only this has  
bit 4 = 1

$$\therefore \text{bit 4} = A \cdot B \cdot C \cdot D$$

Bit 1

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

BD

Bit 2

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

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

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

Bit 3

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

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