

Value

- Decimal $[0 \rightarrow 9] \Rightarrow (1467)_{10}$
- Binary $[0, 1] \Rightarrow (101)_{2}$ or 08101
- Octa $[0 \rightarrow 7] \Rightarrow (22)_8$
- Hex $[0 \rightarrow 9, A, B, C, D, E, F] \Rightarrow 0x$ or $(\text{---})_{16}$

→ Convert to decimal.

$$(4586)_{10} \Rightarrow 10^3 \times 4 + 10^2 \times 5 + 10^1 \times 8 + 10^0 \times 6 = 4586$$

الرتبة

الرقم $\times (10^{\text{الرتبة}})$

$$(0001101)_{2} \Rightarrow 2^6 \times 0 + 2^5 \times 0 + 2^4 \times 0 + 2^3 \times 1 + 2^2 \times 1 + 2^1 \times 0 + 2^0 \times 1 = 13$$

كل رقم في Hex decimal يعادل 4 أرقام في Binary

Hex Binary

0 0000

1 0001 → Nibble

2 0010

3 0011

4 0100

5 0101

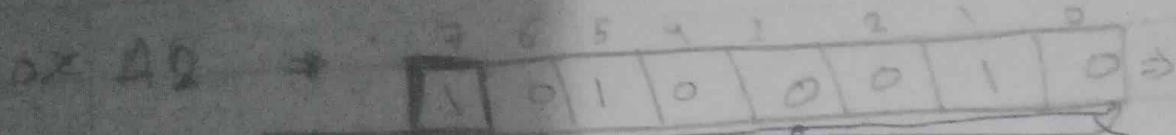
6 0110

7 0111

0x74055

00 0411 0100 1011 1111 0101

لو قسمناه ذاكرة بنافه 8 خاناه فقط 4 بايت



خانه شماره 0 → +
 1 → -

signed (162)₁₀
 signed (-94)₁₀

- 0 → 0000
- 1 → 0001
- 2 → 0010
- 3 → 0011
- 4 → 0100
- 5 → 0101
- 6 → 0110
- 7 → 0111
- 8 → 1000

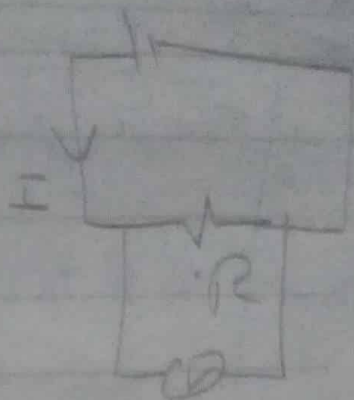
- 1 → 1111
- 2 → 1110
- 3 → 1101
- 4 → 1100
- 5 → 1011
- 6 → 1010
- 7 → 1001

- 8
- 6
- 5
- 4



6

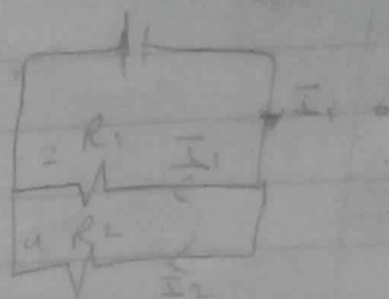
Ohm's law $\Rightarrow V = I \cdot R$



$$I \cdot R_1 = (E - I \cdot R_1) / R_2$$

$$I \cdot R_1 = E R_2 - I \cdot R_1$$

$$I \cdot (R_1 + R_2) = E R_2$$



$$I_1 = I \times \frac{R_2}{R_1 + R_2}$$

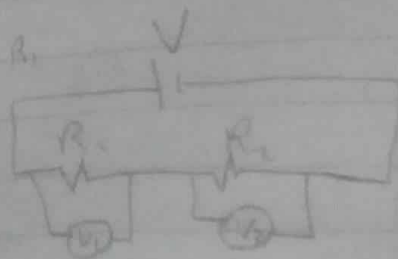
→ voltage divider

$$\frac{V_1}{R_1} = \frac{V - V_1}{R_2}$$

$$V_1 R_2 = V R_2 - V_1 R_1$$

$$V_1 (R_1 + R_2) = V R_2$$

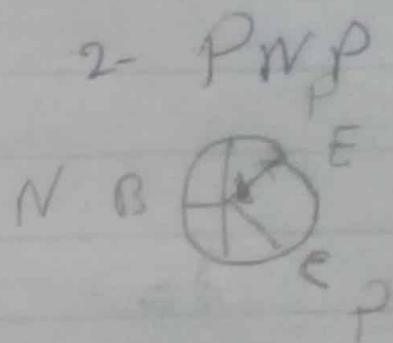
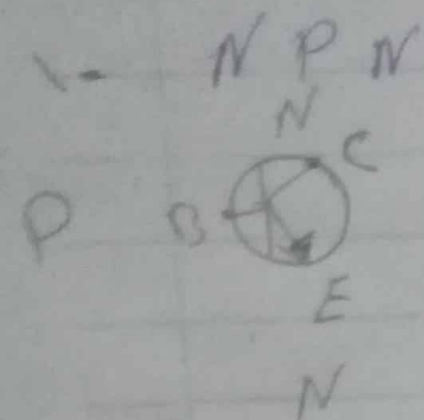
$$V_1 = V \times \frac{R_2}{R_1 + R_2}$$



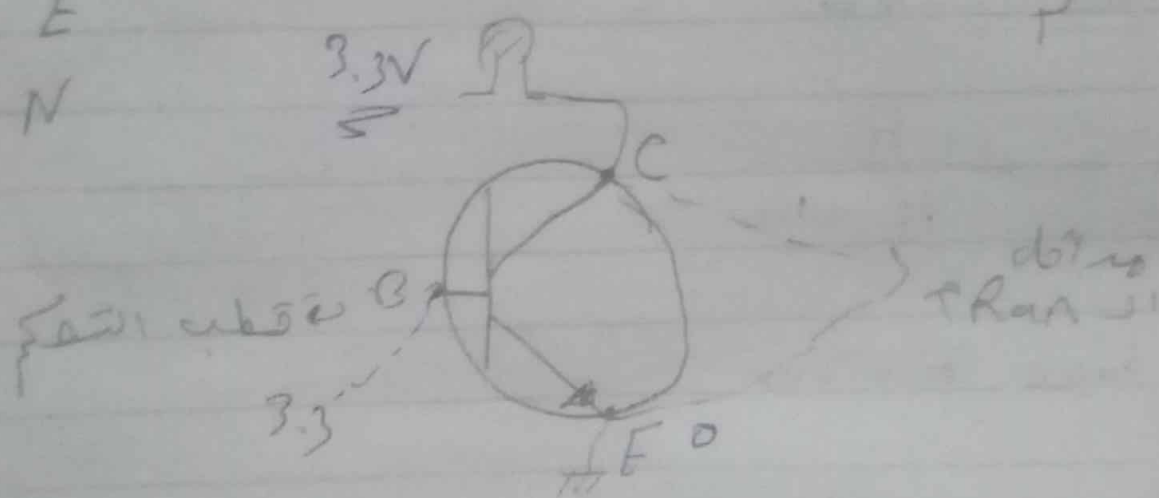
7)

Transistor

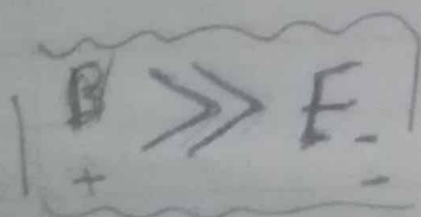
هو عبارة عن switch يتم التحكم فيه من طرفين إشارة كهربائية



NPN

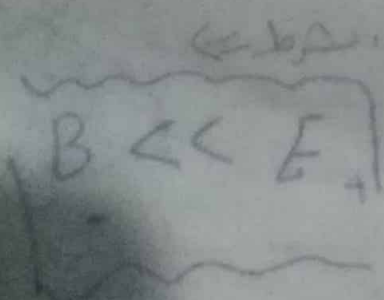
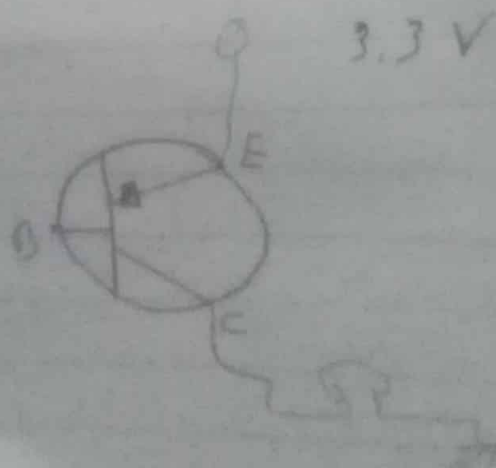


الشرط لكي يفتح الترانزستور يجب أن يكون هناك فرق بين Base و E



الشرط <<

PNP

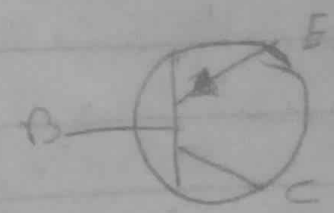
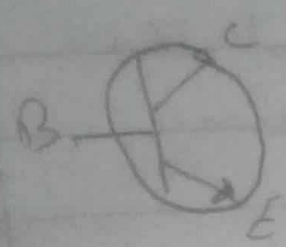


~~NPW~~ NPW ← دائماً في القطع الأفقي، ضيقاً
 يتم توصيل E في القطع الأفقي، ضيقاً

~~PNP~~ PNP ← دائماً في القطع الأفقي، ضيقاً
 يتم توصيل E في القطع الأفقي، ضيقاً

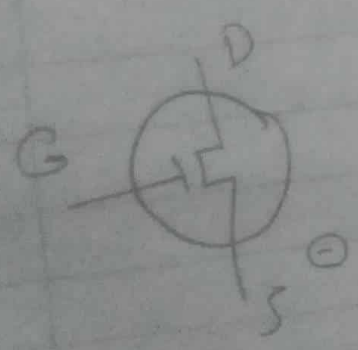
NPW

~~~~~
 PNP تولد current

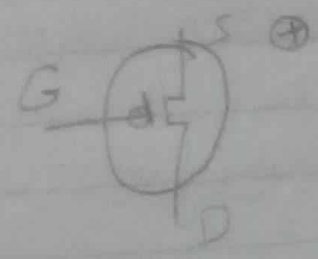


MOSFET

Voltage تولد



N-channel

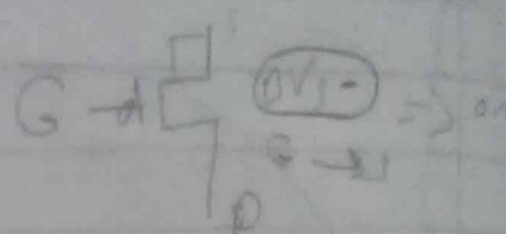
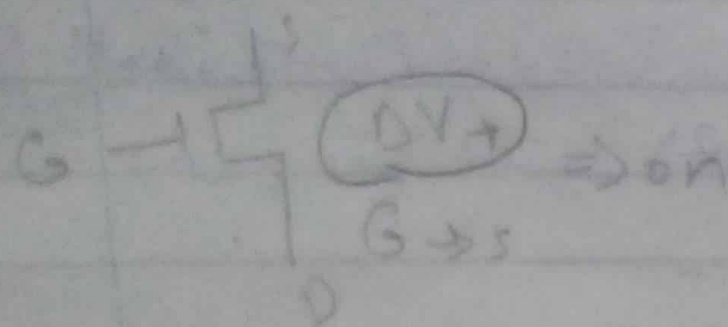


P-channel



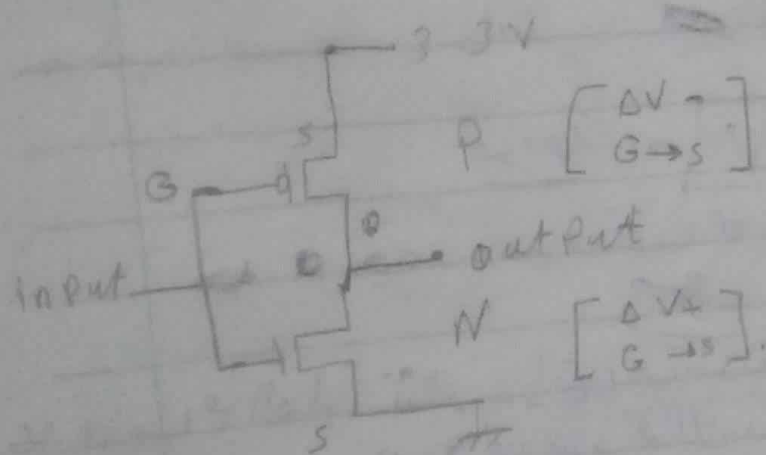
N-channel

P-channel



Not Gate

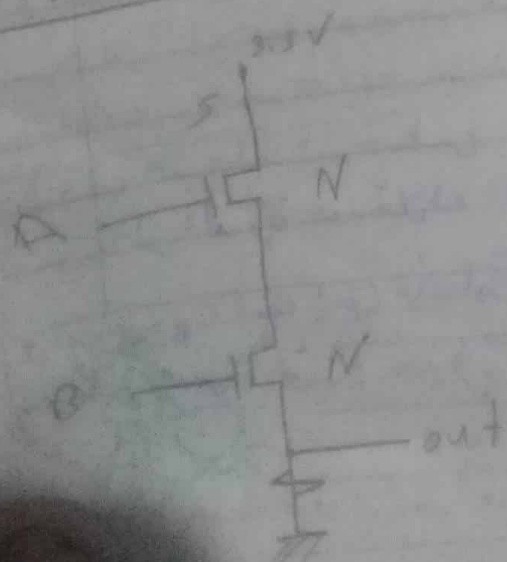
input	output
0	1
1	0



AND Gate



A	B	out Put
0	0	0
0	1	0
1	0	0
1	1	1



8

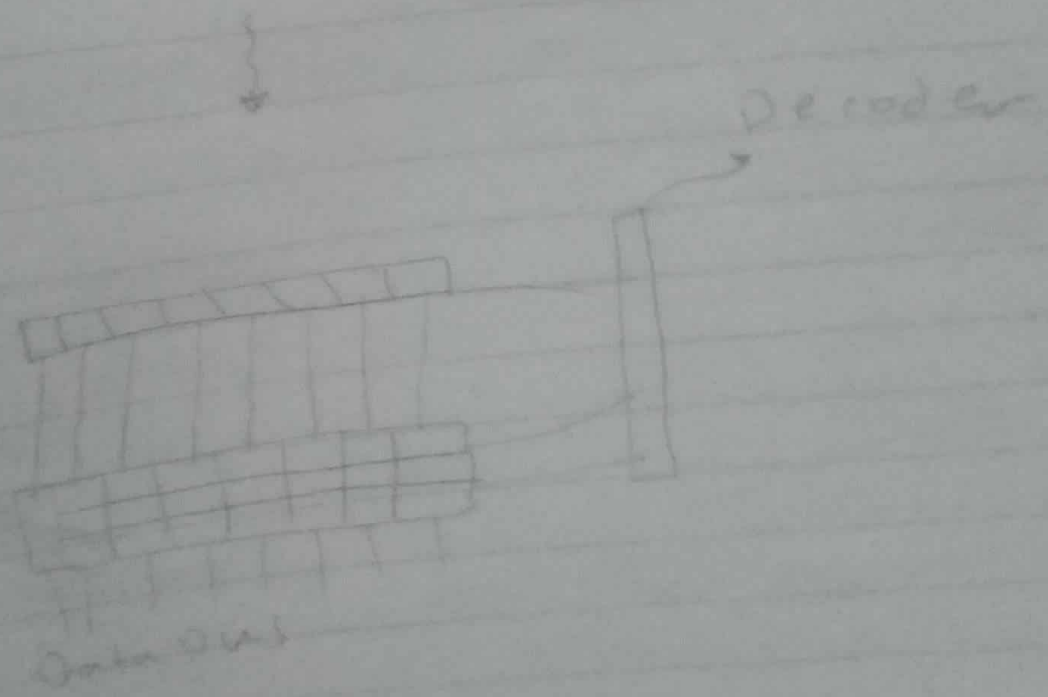
→ Volatile memory: ~~ex~~ RAM

→ non volatile: SD card

8 Bit = 1 Byte

1 Kilo byte = 1024 Byte

1 Mega byte = 1024 Kilo byte



→ $2^n = \text{Available Addresses}$

* Address Bus
Data Bus