

Subject:

Year.

Month.

Date.

اسماء - 11 فبراير 2020

(1)

الف)

| A | B | Q    | Q' | Q <sup>+</sup> |
|---|---|------|----|----------------|
| 0 | 0 | 1    | 0  | 1              |
| 0 | 1 | hold |    | 0              |
| 1 | 0 | 0    | 1  | 0              |
| 1 | 1 | hold |    | 1              |

Q<sup>AB</sup>

|   | 00 | 01 | 11 | 10 |
|---|----|----|----|----|
| 0 | 1  | 0  | 0  | 0  |
| 1 | 1  | 1  | 1  | 0  |

$$Q^+ = QB + AB'$$

ب)

| AB | Q    | Q'   | Q <sup>+</sup> |
|----|------|------|----------------|
| 00 | 1    | 0    | 1              |
| 01 | 1    | 0    | 1              |
| 10 | hold | hold | 0              |
| 11 | NA   | NA   | X              |

Q<sup>AB</sup>

|   | 00 | 01 | 11 | 10 |
|---|----|----|----|----|
| 0 | 1  | 1  | X  | 0  |
| 1 | 1  | 1  | X  | 1  |

$$Q^+ = Q + A'$$

الف)

| AB | Q | Q <sup>+</sup> |
|----|---|----------------|
| 00 | 1 | NA             |
| 01 | 0 | NA             |
| 10 | 0 | NA             |
| 11 | 0 | NA             |

ب)

| A | B | Q | Q <sup>+</sup> |
|---|---|---|----------------|
| 0 | 0 | 1 | 1              |
| 0 | 1 | 0 | NA             |
| 1 | 0 | 0 | NA             |
| 1 | 1 | 0 | NA             |

(2)

ج)

| S | R | Q | Q <sup>+</sup> |
|---|---|---|----------------|
| 0 | 0 | 1 | hold           |
| 0 | 1 | 0 | 0              |
| 1 | 0 | 0 | 1              |
| 1 | 1 | 0 | NA             |

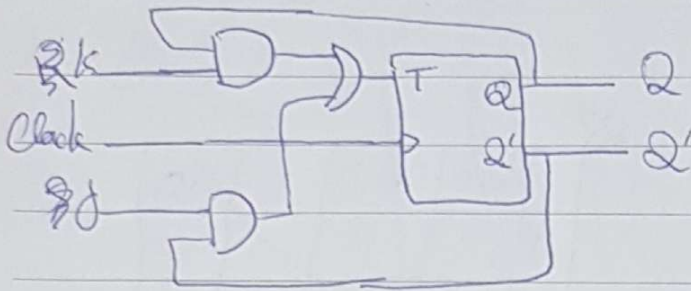
S-R latch

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And  $Q' + KQ$  (3)  
Or  $Q'$

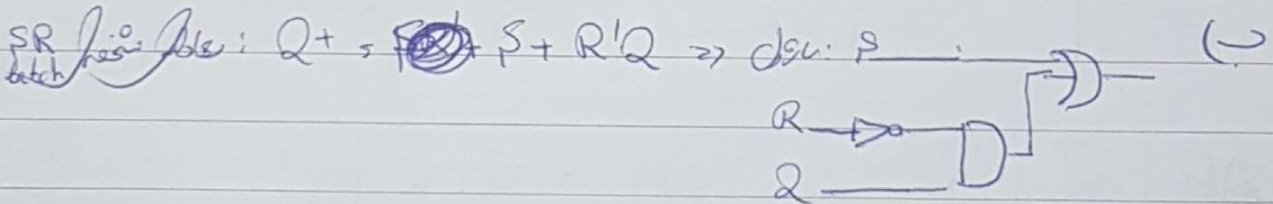
| $Q$ | $KQ$ | 00 | 01 | 11 | 10 |
|-----|------|----|----|----|----|
| 0   | 0    | 0  | 0  | 1  | 0  |
| 1   | 1    | 0  | 0  | 1  | 1  |

$T = 0Q' + KQ$

| S | R | Q | Q <sup>+</sup> |       |
|---|---|---|----------------|-------|
| 0 | 0 | 0 | 0              | hold  |
| 0 | 1 | 0 | 0              | reset |
| 1 | 0 | 0 | 1              | set   |
| 1 | 1 | 0 | 0              | reset |

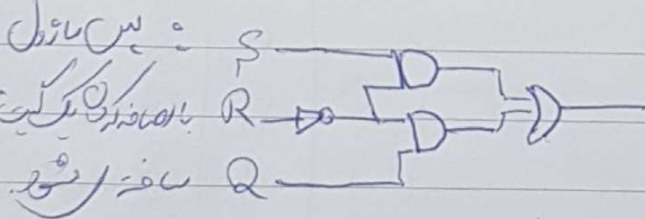
| $Q$ | $SR$ | 00 | 01 | 11 | 10 |
|-----|------|----|----|----|----|
| 0   | 0    | 0  | 0  | 0  | 1  |
| 1   | 1    | 1  | 0  | 0  | 1  |

$Q^+ = SR' + QR'$



reset dominate

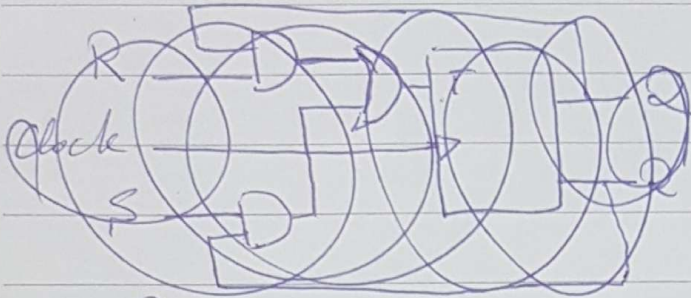
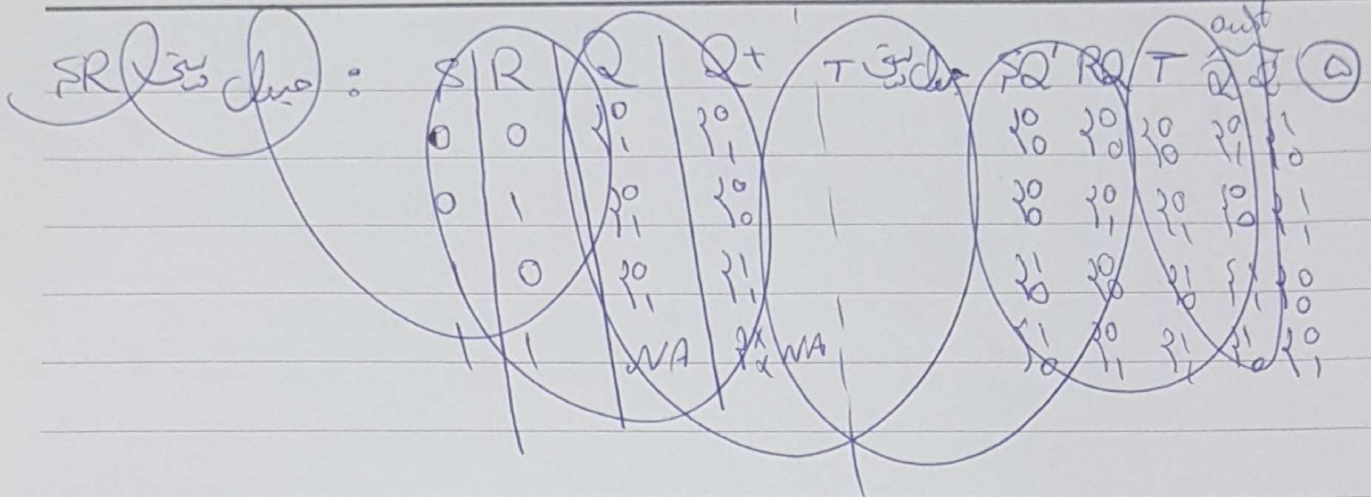
Flip Flop





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| D | Q | 0 | 1 |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | X |

$S=D$

| D | Q | 0 | 1 |
|---|---|---|---|
| 0 | X | 1 | 1 |
| 1 | 0 | 0 | 0 |

$R=D'$

