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M. Sc. Sem III
Paper - MPHY CC-12
Electronics II

X

9.

VKSU

Bistable Multivibrator

Circuit with truth table is shown in fig.

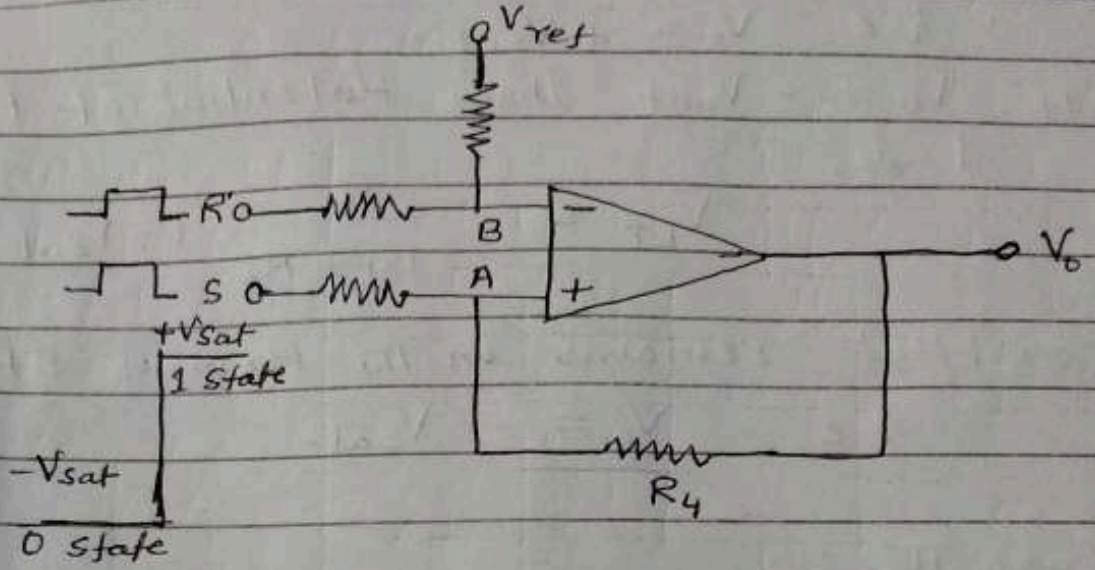

fig $V_o = +V_{sat}$, $V_o = -V_{sat}$

S-R flip flop, S is set, R is reset

S	R	Q_{n+1}
0	0	Q_n
0	1	0
1	0	1
1	1	not used

Case 1 :- $S=0$, $R=0$, i.e. no Pulse is applied at S and R inputs. Taking $V_{ref} = 0$.

If $V_o = +V_{sat}$ Then Potential at Point A is

$$V_{UT} = \frac{R_1}{R_1 + R_4}(+V_{sat})$$

output remains in the previous state
i.e $V_o = +V_{sat}$

If $V_o = -V_{sat}$ then Potential at Point A is,

$$V_{LT} = \frac{R_1}{R_1 + R_4}(-V_{sat})$$

output remains in the previous state
i.e, $V_o = -V_{sat}$

Case II :

$S = 0, \quad R = 1.$

If $V_o = +V_{sat}$

Potential at Point A is

$$V_{UT} = \frac{R_1}{R_1 + R_4}(+V_{sat})$$

Now at R terminal a Pulse is given of Magnitude at Point B to be ~~generat~~ greater than V_{UT}. Then output is

$$V_o = -V_{sat}$$

If $V_o = -V_{sat}$

Potential at Point A is

$$= \frac{R_1}{R_1 + R_4}(-V_{sat})$$

If a Pulse is given to R-terminal then output $V_o = -V_{sat}$

i.e. with S=0 and R=1 output is at Reset state, i.e. 0 state ($-V_{sat}$).

Case - III -

When S = 1, R = 0

If $V_o = +V_{sat}$

Potential at Point A is

$$= \frac{R_1}{R_1 + R_4} (+V_{sat}) + \text{Pulse}$$

If a Pulse is given to S terminal, Potential at Point A is more positive and hence output

$$V_o = +V_{sat}$$

If $V_o = -V_{sat}$

Potential at Point A is

$$= \frac{R_1}{R_1 + R_4} (-V_{sat}) + \text{Pulse}$$

If the amplitude of the Pulse is more than the -ve Potential at Point A due to $V_o = -V_{sat}$ then resultant Potential at Point A is Positive i.e. $V_o = +V_{sat}$. That is with S = 1 and R = 0 it is in set state (1 state or $+V_{sat}$)

Case - IV

S = 1, R = 1, not used.