PLATFORMIO

1. **Question(GATE-IN-2021-36):**Given below figure 1 is the diagram of a synchronous sequential circuit with one $J-K$ flip-flop and one T flip-flop with their outputs denoted as A and B respectively,with$J_A = (A' + B'), K_A = (A + B)$,and $T_B = A$.

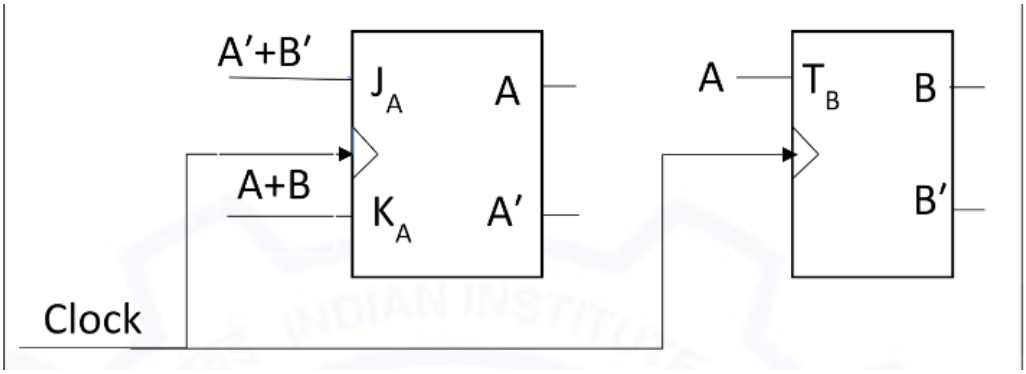

Figure 1

Starting from the initial state ($AB = 00$),the sequence of states (AB) visited by the circuit is

(a) $00 \rightarrow 01 \rightarrow 10 \rightarrow 11 \rightarrow 00...$

(b) $00 \rightarrow 10 \rightarrow 01 \rightarrow 11 \rightarrow 00...$

(c) $00 \rightarrow 10 \rightarrow 11 \rightarrow 01 \rightarrow 00...$

(d) $00 \rightarrow 01 \rightarrow 11 \rightarrow 00...$

Solution :$J_A = A' + B' = (AB)'$
$K_A = A + B$;

$T_B = A$.
As the given initial state is $AB = 00$.

So,the required truth table is as shown in table 1.

Present state		**FF-$J_AK_AT_B$**		**Next state**	
A	**B**	J_A	K_AT_B	**A**	**B**
0	0	1	00	1	0
1	0	1	11	0	1
0	1	1	10	1	1
1	1	0	11	0	0

Table 1

$\therefore$ The sequence of the state AB is $(b)00 \rightarrow 10 \rightarrow 01 \rightarrow 11 \rightarrow 00...$