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Code – CSE-223.

Answer to the Question- 1-ⓐ

ⓐ Ans: Flip-flop: A flip-flop in Digital Electronics is a circuit with two stable states that can be used to store binary data. The stored data can be changed by Applying varying inputs. Flip-flop and latches are fundamental building blocks of Digital Electronics system used in Computers, Comunication, and Many Others type Of System. Both are used as data storage elements.

For Example: Let us talk About SR latch and SR flip flop. In this circuit when you set S as active. the Out put Q will be high and $\bar{Q}$ will be low. This is irrespective of any things else. (This is an Active low – circuit, so active here mens low, but for an Active high Active would mean high

Answer – 1 – (b)

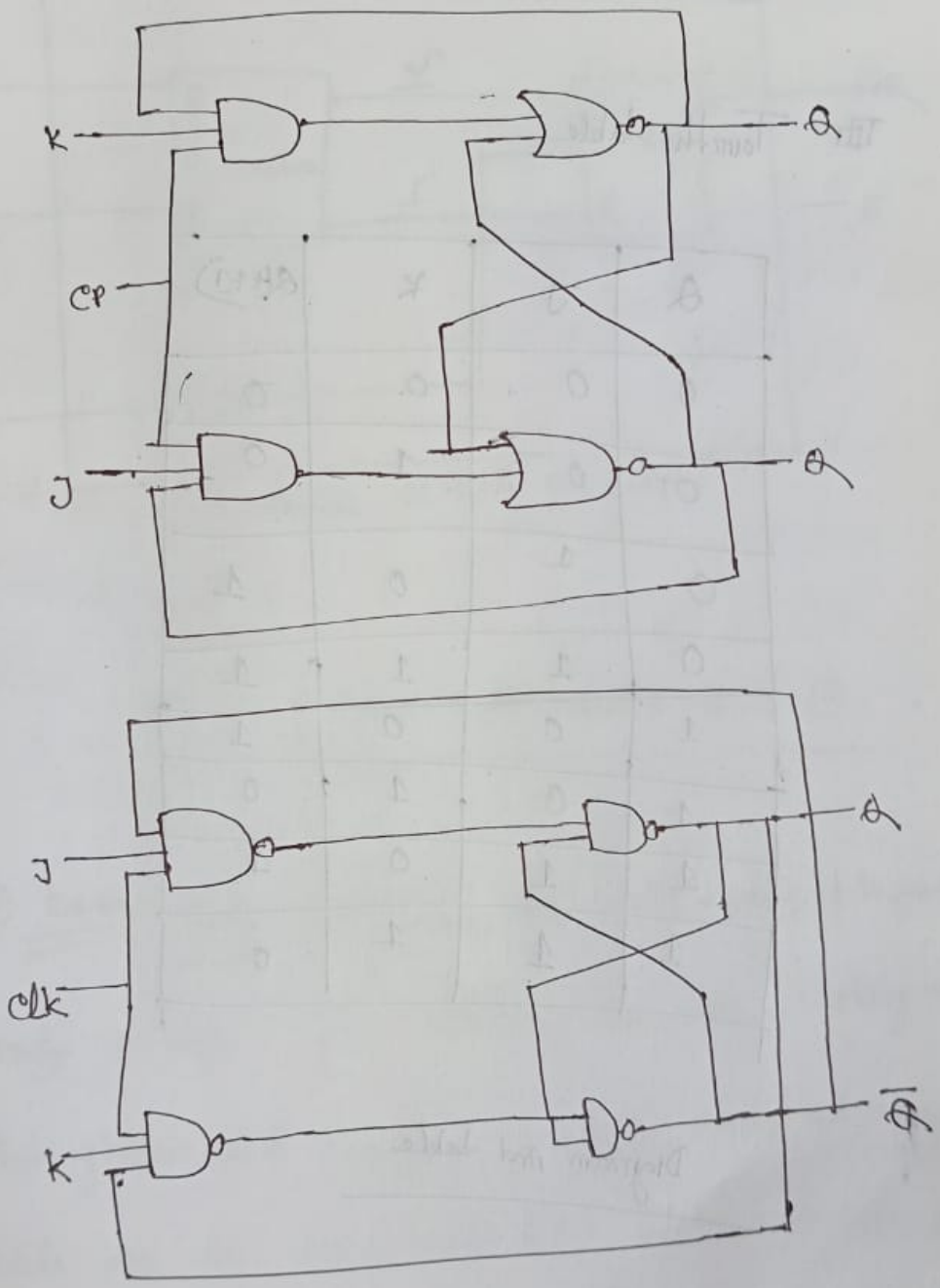
(b) Answer: Types Of Sequential Circuits: There are two types of Sequential Circuits:

Type 1: Asynchronous Sequential Circuit. Thiese Circuits do not use a Clock Signal but used the pules of the input. Thes Circuits are faster than synchronous Sequential Circuits because there is clock pulse And Change ~~there~~ their State ~~immediately~~ Immediately when there is a Change in the Output Signal. we use asynchronous Sequential Circuits when Speed of Operation is Important and Independent Of internal clock pulse.

Type-2: Synchronous Sequential Circuit: Thes Circuits uses Clock Signal and Level input (or pulsed) (with restriction on pulse witht and circuit propagation). The output pulse is the Same duration as the Clock pulse for the clocked Sequential Circuits. Since they wait for the next clock pulse to Arrived to perform the next operation. so thes circuits are bit slowere compared to asynchronous. Level output Change state at the Start of an input pulse and remain in that until the next input or clock pulse.

Answer to the Question No-2

(a) Answer: Controlled Latches using JK Flip-Flop:



Draw controlled Latches JK.

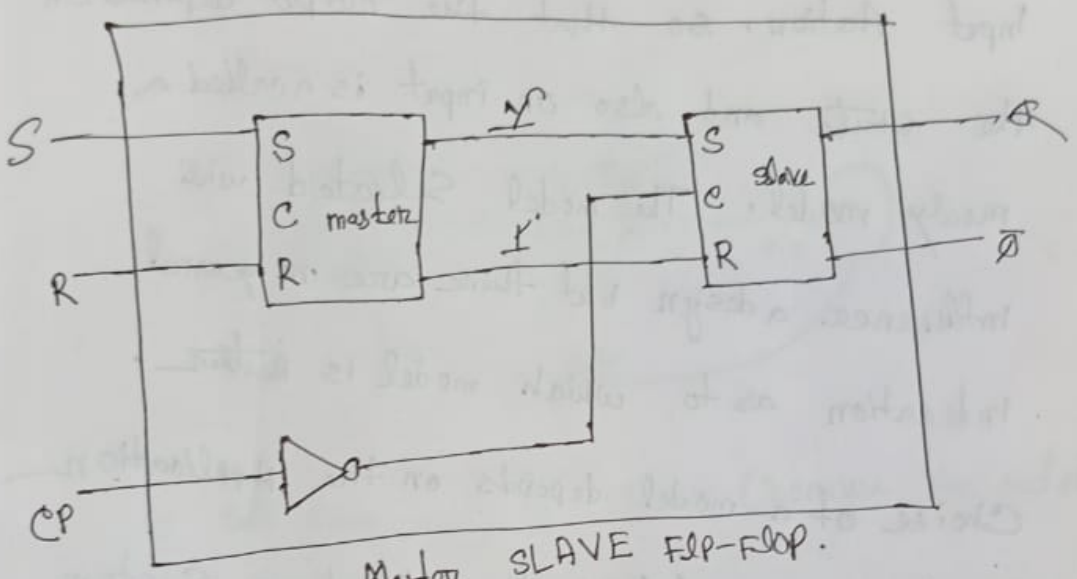
⇒ we can show a characteristics table to show detail about JK latch here is the characteristic.

III Fourth table

Q	J	K	Q(t+1)
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

Diagram And table

(b) Answer: Draw the master Slave SR - Flop - Flop



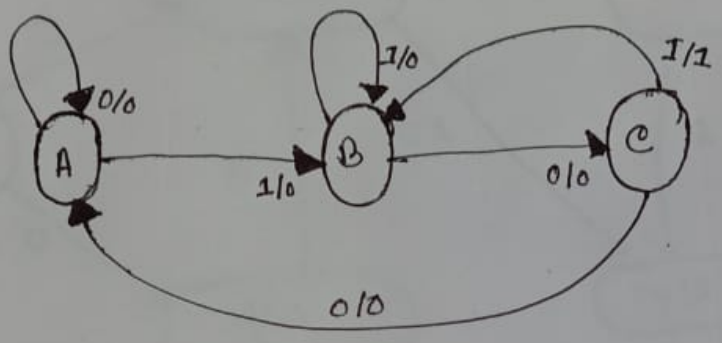
Master SLAVE Flp-Flop.

Answer to the Question No - 3 - (a)

3 (a) Answer: Mealy models/moore: The mealy models it Requires only 5 state. The states: Idle: Idle, cooking and Cooking Interrupted for that model. mealy and moore models are the Basic models of State machins. A State machine which uses only Entry Action, so

that it is output depends on the state, is called a moore model. A state machin which use only Input Action. so that the output depends on the state and also on input is a called a mealy model. The model selected will influence a design but there are no general Indication as to which model is Better. Choice of a model depends on the Application Execution mens (for instance, Hardware System are usally best realised as moore models) and personal preference of a designer or programer. In practise, mixed models are often used with several action type.

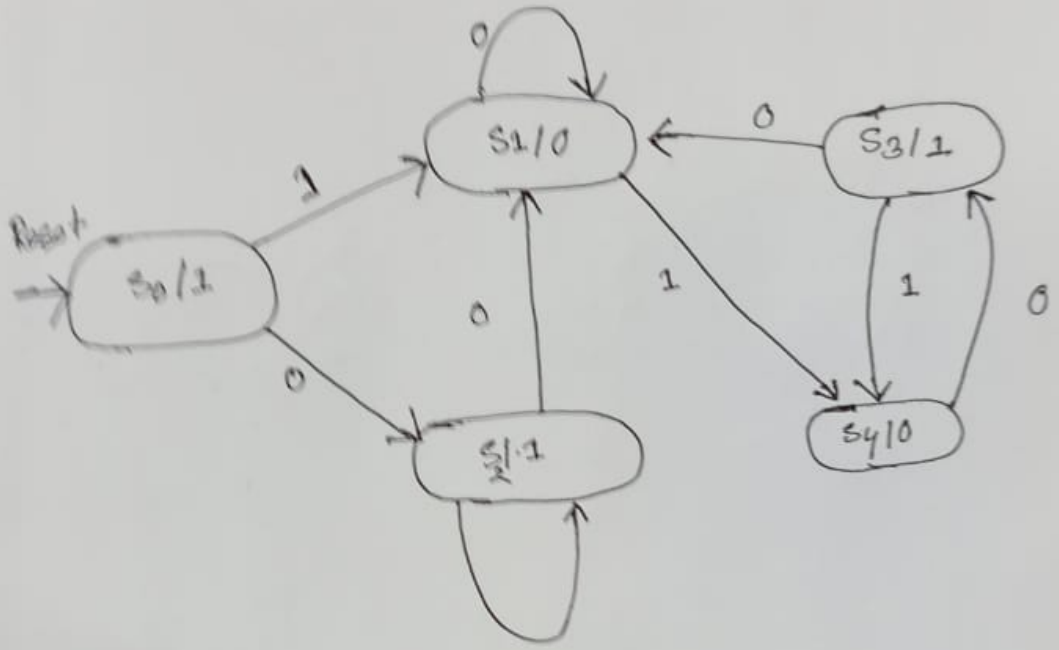
3 (b) Answer: Mealy State machine Diagram.



⇒ Self arcs must be shown (because the output values are shown on the arcs.

⇒ Can be more compact than moore machine especially when two or more arcs with different output values go into the same state.

(3) (c) Answer: State Diagram moore machine:



(a) provide the state transition table.

(b) Implement the moore FSM using T FFs (assign the value to the state starting from 0 And adding 1 fore each next state 0, 1, 2...)

(c) Convert the moore FSM in a mealy style using state Diagram (you dont have to Implement it, you must show only the state Daigream.