Experiment - 7

Aim: To design
1. Shift Register
2. Bidirectional register with parallel load

Software Used: MODELSIM

Theory: A register is a device which is used to stock multiple bits of data. Shift register is a group of register which can move data within registers and in/out of register by applying clock pulses. Shift registers are of 4 types:

1. **Serial In Serial Out Register:** The shift register which allows serial input & produces a serial output is known as serial in serial out register. Since there is only one output. The data leaves the shift register one bit at a time in serial pattern

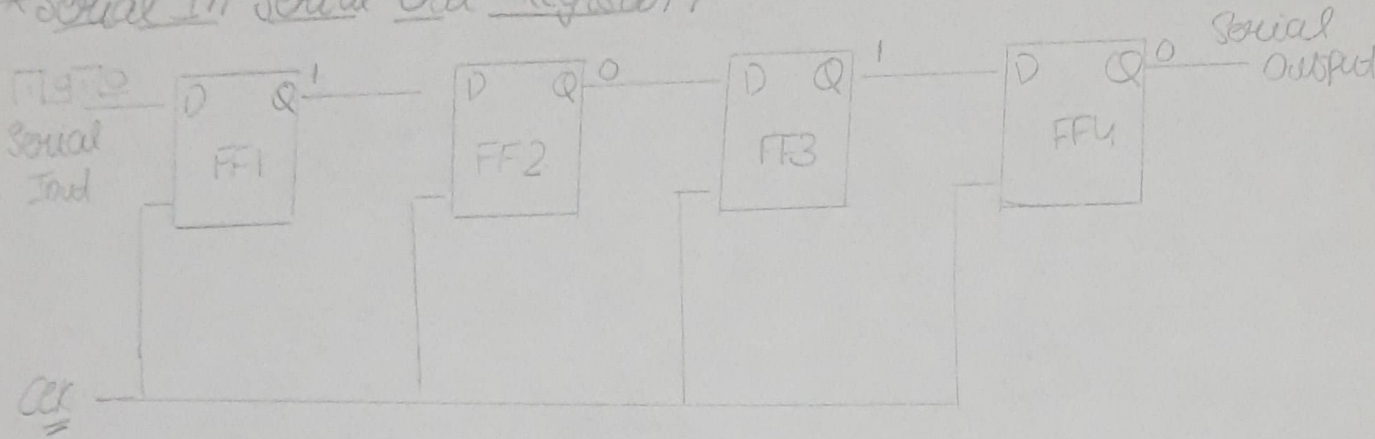
2. **Serial In Parallel Out Register:** The shift register which allows serial input & produces a parallel output is known as serial in parallel out shift register. The output of the first flip flop is connected to input of next flip flop & so on. All these flip flops are synchronous with each other since same clock is applied to each flip flop.

3. Parallel In Serial Out Register :-
The shift regisles which allows parallel input & produces serial output is known as parallel in serial out register. The clock is directly connected to all flip flops. The output of previous flipflop & parallel data input are connected to MUX & output is connected to next flip flop.

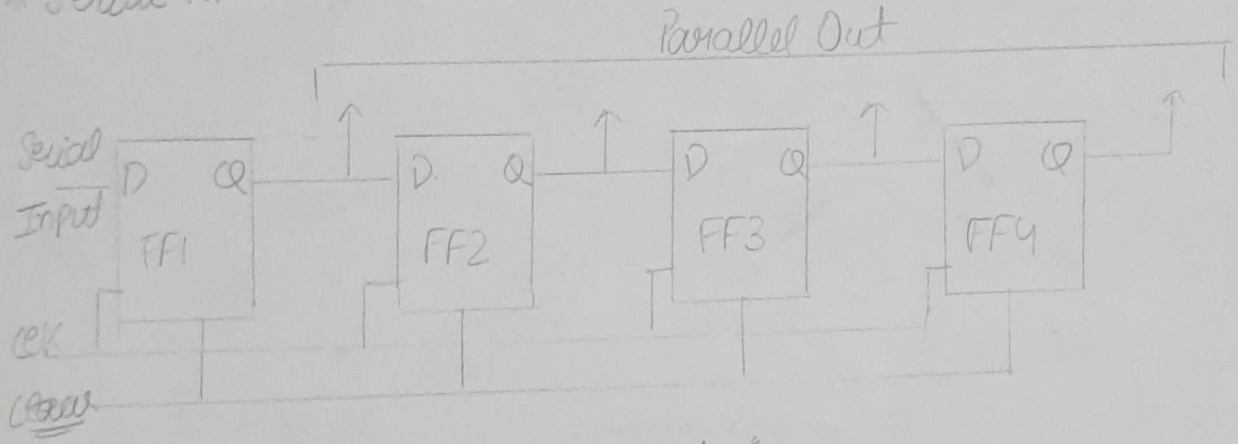
4. Parallel In Parallel Out Register :-
The shift register which allows parallel input & also produces parallel output is known as parallel output is known as parallel in parallel out register. In this type of register there is no interconnection b/w individual flip flops since no serial shifting of data is required. Data is given as input seperately for each flip flop and in same way output is collected individually from each flip flop.

Bidirectional Shift Register with parallel load :-
Bidirectional shift register are register which are capable of shifting the data either right or left depending on the mode selected. If the mode selected is high (1), the data is shifted towards right direction & if mode selected is low (0), the data will be shifted towards left direction. The circuit consist of four D flip flops, the input data is connected at 2 ands of circuit depending on the mode selected only one and gate is in the active state

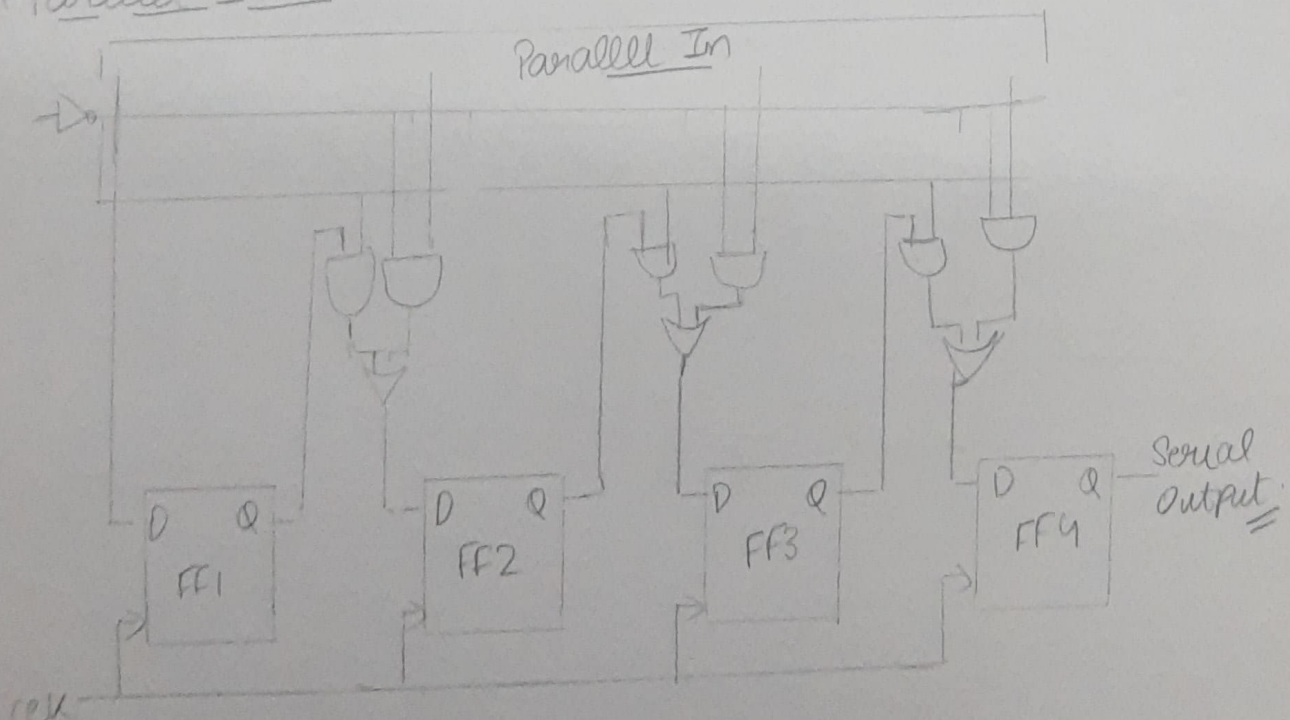
* Serial In Serial Out Register :-



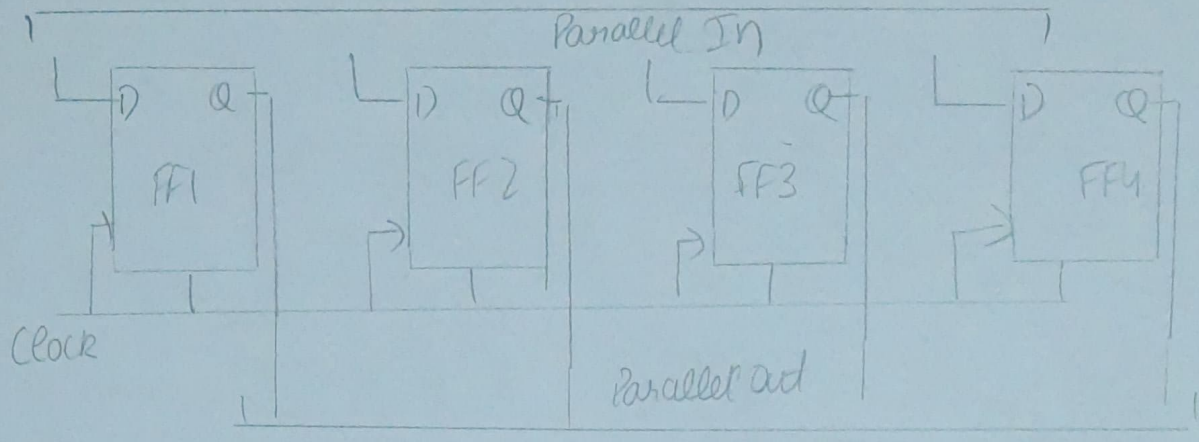
* Serial In Parallel Out Register :-



* Parallel In Serial Out Register :-



* Parallel In Parallel out :



* Bidirectional Register :