SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

23ECB201 – DIGITAL SYSTEMS DESIGN

II YEAR/ III SEMESTER

UNIT 4 – SHIFT REGISTERS AND COUNTERS

TOPIC 4.3 – Universal Shift Registers

Universal Shift Register

➢ Universal Shift Register is a type of register that contains the both right shift and the left shift. It has also parallel load capabilities

➢ Generally, these types of registers are taken as memory elements in computers. But, the problem with this type of register is that it shifts only in one direction

➢ In simple words, you mean that the universal shift register is a combination of the **bidirectional shift register** and the **unidirectional shift register**
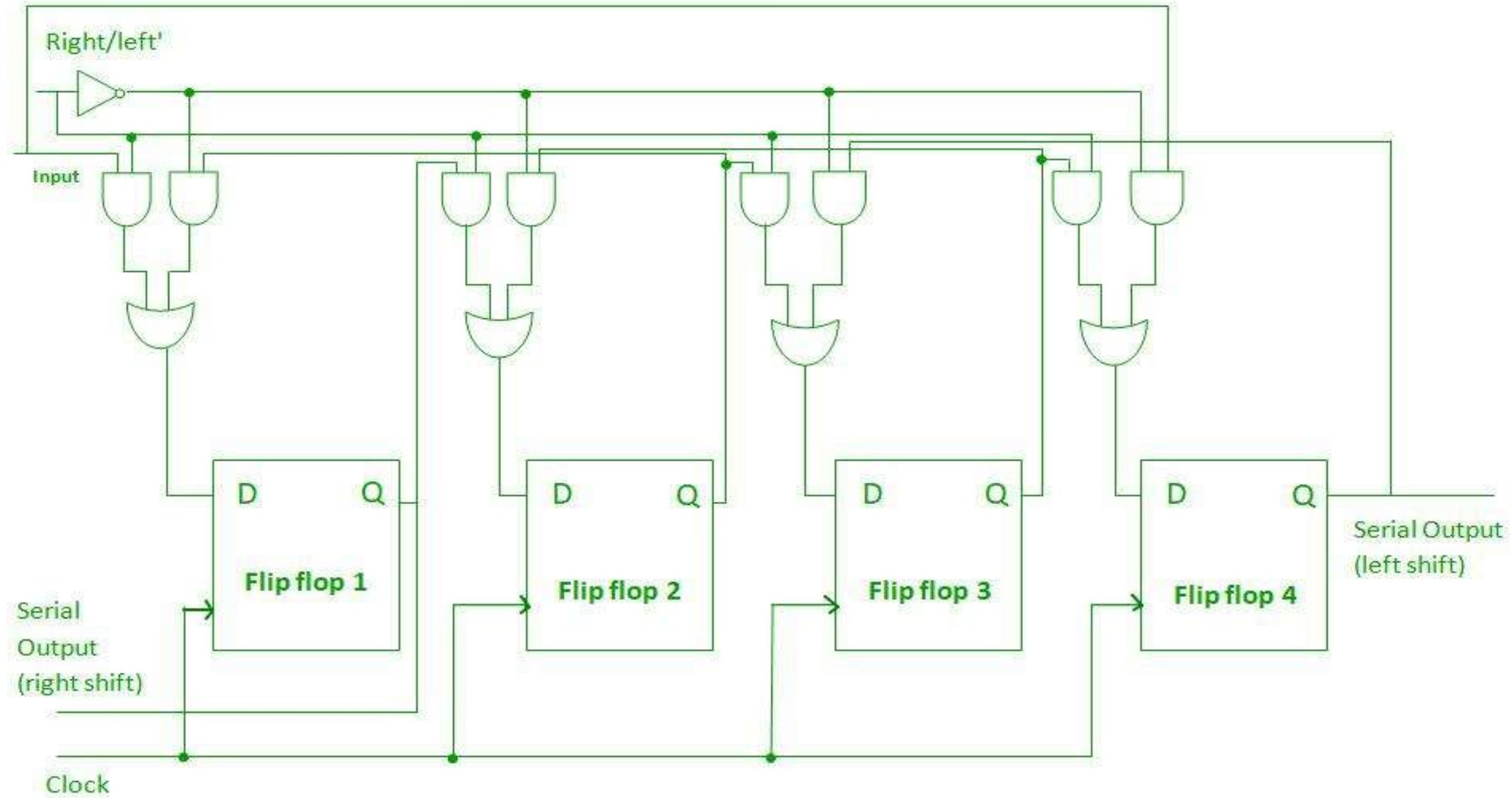
Bidirectional Shift Register

➢ If we shift a binary number to the left by one position, it is equivalent to multiplying the number by 2 and if we shift a binary number to the right by one position, it is equivalent to dividing the number by 2 To perform these operations we need a register which can shift the data in either direction

➢ Bidirectional shift registers are the registers that are capable of shifting the data either right or left depending on the mode selected

➢ If the mode selected is 1(high), the data will be shifted toward the right direction and if the mode selected is 0(low), the data will be shifted towards the left direction. The logic circuit given below shows a Bidirectional shift register

➢ The circuit consists of four D flip-flops which are connected

➢ The input data is connected at two ends of the circuit and depending on the mode selected only one gate is in the active state.
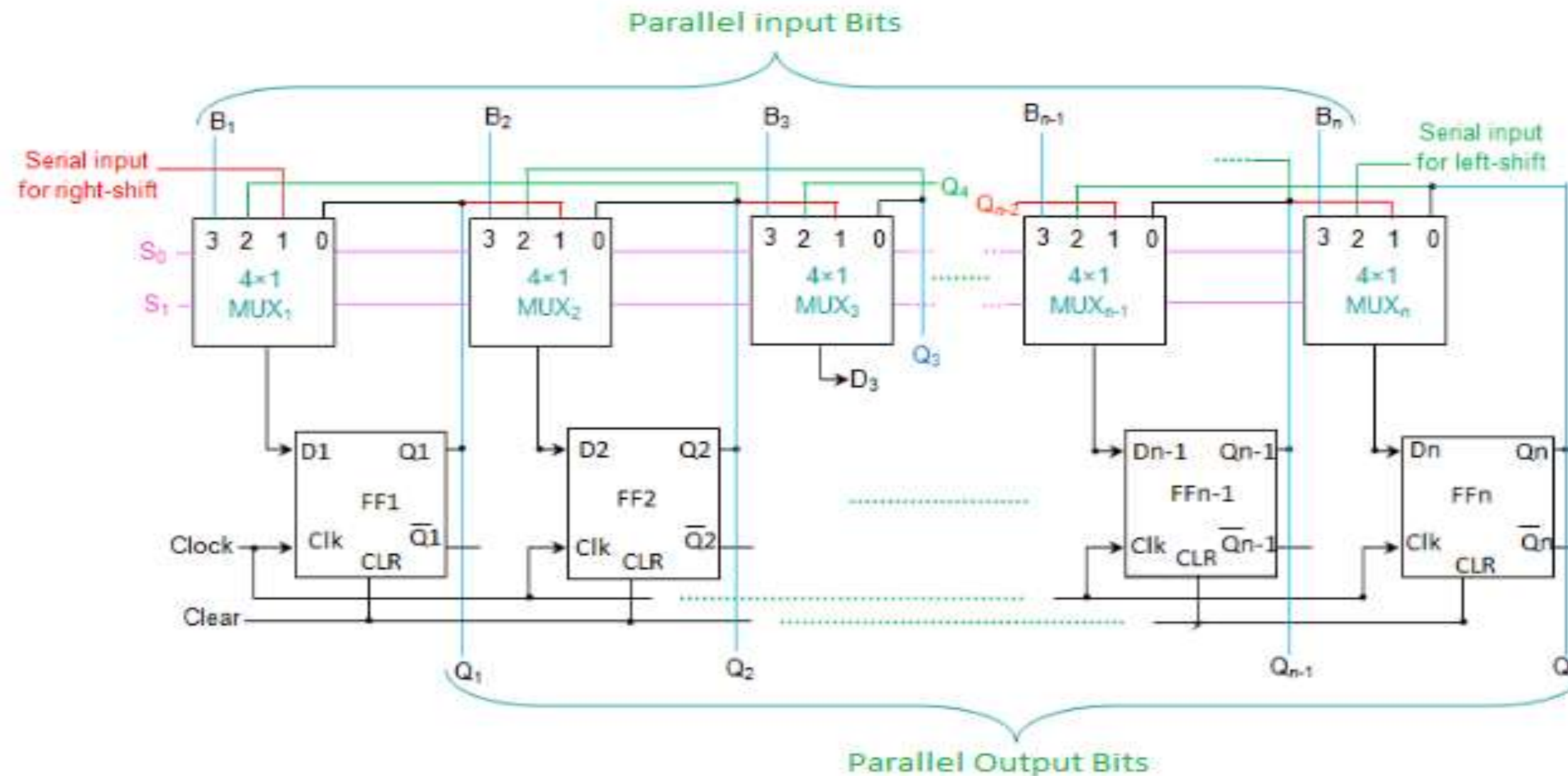
Bidirectional Shift Register

Universal Shift Register

➢ N-bit universal shift register consists of flip-flops and multiplexers

➢ Both are N in size. In this, all the n multiplexers share the same select lines and this select input selects the suitable input for flip-flops

THANK YOU