



Q_1 : Design register circuit that convert data from left to right and from right to left at the same time using enable element to control the conversion operation.

Q_2 : Fill in blanks

- 1- An asynchronous is also called ---- counter or a ---- counter.
- 2- For down-counters, the ---- of the first flip-flop is used as a clock pulse for the second flip and so on, when the flip-flops respond to the positive edge of the clock pulse.
- 3- The F.F. that can be used as a parallel data storage is ----.
- 4- The ring counter, also called a ----.
- 5- The difference state in binary for a counter divided by 4000 using 74HC161 four bits counter only is ----.

Q_3 : Design (*3bits*) counter that counts only odd numbers, using *D* flip-flops with positive edge clock pulse.