Paper 7, TDC Part-3 Chapter-1, Fundamental Concept of Digital **Electronics NOR Gate as a Universal Gate By: Mayank Mausam Assistant Professor (Guest Faculty) Department of Electronics** L.S. College, BRA Bihar University, **Muzaffarpur, Bihar**

In last class we have seen about 'NOR' Gate functionality and its behavior for different input condition.

NOR gate is also a universal gate, as all three basic gates, "NOT", "OR" & "AND" can also be realized using "NOR".

Any digital function can be realized using the basic gates and as all basic gates can be realized using the NOR gate, so any logic function can be realized using NOR Gate. Therefore 'NOR' gate is a universal gate.

Similarly the truth table of a NOR Gate with any numbers of input signals can be written. The output of a NOR Gate will be at logic "1 (High)" when all the input signals are at logic "0 (Low)" otherwise for any other combinations of inputs signal, the output will be at logic "0 (Low).

All three basic gates, "NOT", "OR" & "AND" gate can also be realized using "NOR" Gate



4













<u>Realization of NAND Logic using NOR Logic :-</u>

In a similar manner NOR operation can be realized using the NAND logic. Implementation of NOR logic using NAND logic has been left as a task.

We have realize all types of logic gate through either "NAND" or "NOR" logic. So we can design any type of digital circuit through only either NAND or NOR logic. Due to this reason NAND and NOR gate are also referred as universal gate.

