

DAY 3 -111 DAYS VERIFICATION CHALLENGE

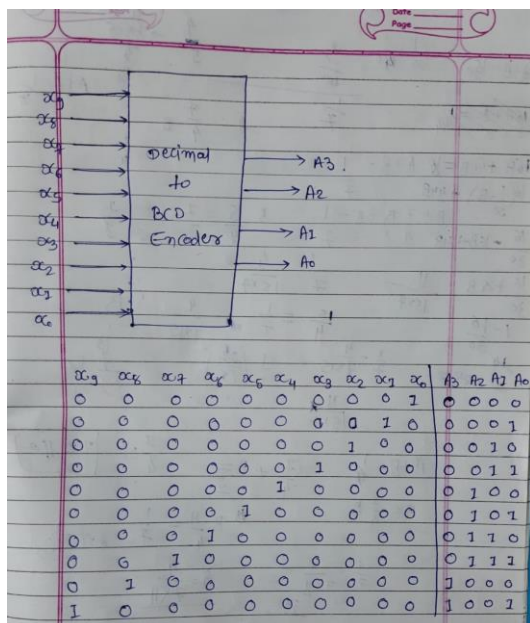
Topic: Encoders, Decoders

Skill: Digital Electronics

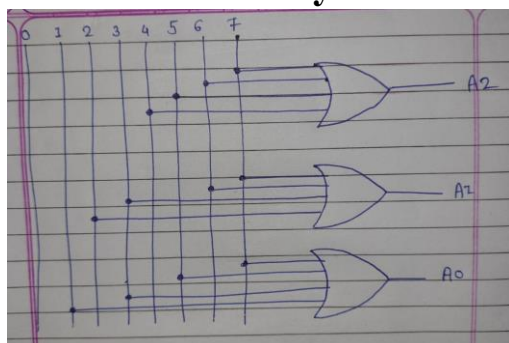
DAY 3 CHALLENGE:

1. Design & explain working of:

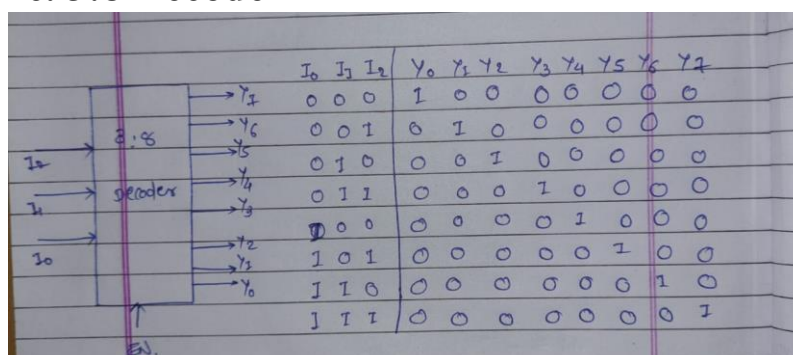
a. Decimal to BCD encoder



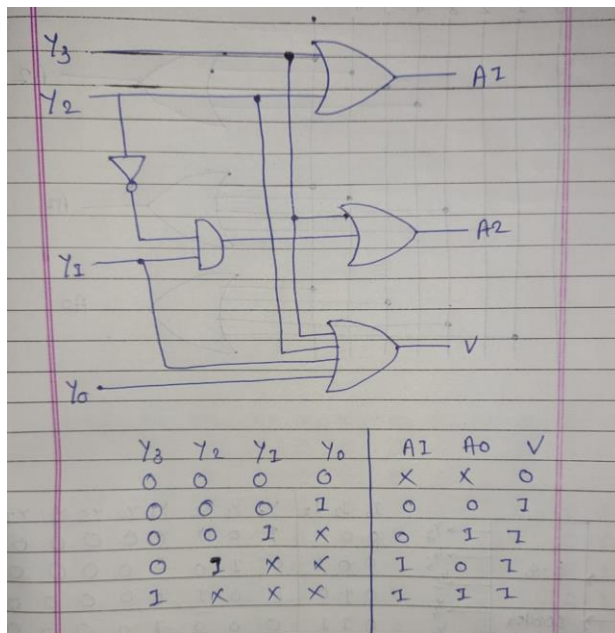
b. Octal to Binary encoder using OR gates.



c. 3:8 Decoder



d. 4: 2 Priority Encoder



2. Explain difference between:

a. Encoder & Decoder

an encoder converts multiple inputs into fewer binary outputs (e.g., 4-to-2), reducing data lines. A decoder reverses this process, converting binary inputs into more outputs (e.g., 2-to-4), enabling the interpretation of encoded data.

b. Encoder & Priority Encoder

An encoder converts multiple inputs into a smaller number of binary outputs, without considering the importance of each input; it simply encodes the inputs that are active. In contrast, a priority encoder does the same encoding but with an added feature: if multiple inputs are active simultaneously, it prioritizes the highest-order input and encodes only that one, effectively ignoring the others. This prioritization is crucial in situations where certain signals need to take precedence over others.

3. Explain applications of:

a. Priority encoder

- Interrupt Handling: Manages multiple interrupts, prioritizing the most critical.
- Network Resource Allocation: Prioritizes data packets for transmission.
- Control Systems: Ensures emergency signals are processed first.

b. Priority Decoder

- Memory Addressing: Selects specific memory cells in RAM.
- Display Systems: Activates segments in digital displays.
- CPU Instruction Decoding: Interprets binary instructions for CPU operations.

4. What are the basic functions of:

a. Digital Encoder

Converts multiple input signals into a smaller number of binary outputs.

b. Digital Decoder

Converts binary inputs into multiple outputs, often activating specific lines or components based on the input.