CS201 Design of Digital Systems MINI PROJECT ABSTRACT – Water level indicator

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COMPONENTS :

1. Water level sensors
2. Power supply
3. Resistors and Transistors
4. Microcontroller or Microprocessor
5. Wires
6. Logic gates

IDEA : To build a water level indicator using logic gates.

USES : A water level indicator is a device used to monitor and display the level of water in various applications. They are often used in homes, buildings, and industries with overhead water tanks to ensure a continuous and adequate water supply, they prevent tanks from running dry and help in timely refilling. In situations where water storage is underground or not easily visible, such as in basements or underground reservoirs, water level indicators are crucial for monitoring water levels. In agriculture water level indicators are used to manage irrigation systems, ensuring crops receive the right amount of water without wastage or underwatering. Thus, overall water level indicators play a crucial role in managing water resources efficiently and preventing potential damage or disruption due to water level fluctuations.

WORKING :

- Probes/Sensors : They are placed at different water levels, typically at the minimum and maximum levels we want to monitor. They are made of conductive material like metal.
- NOT gate (Inverter) : This is a digital logic gate that has one input and one output. The output is the inverse (opposite) of input. It changes a high voltage (1) to a low voltage (0) and vice versa.
- Wiring : (i) Connect one of the probe's ends to the input of the NOT gate (ii) Connect the other probe's end to the ground (0V) or common reference point (iii) Connect the output of the NOT gate to an indicator device, such as an LED or buzzer. (iv) Connect the other terminal of the indicator device to a power supply voltage (Vcc)

OPERATION :

- When there's no water touching the probe connected to the input of the NOT gate, it is in a high voltage state (1),
- Since the NOT gate inverts the input, it will output a low voltage (0) to the indicator device, keeping it off (LED is not lit, and buzzer is silent).
- When water touches the probe and completes the circuit between the probe and the ground the input to the NOT gate becomes low (0).
- The NOT gate then outputs a high voltage (1) to the indicator device, turning it on (LED lights up, and buzzer sounds).

So, essentially, the water level indicator using a NOT gate detects the absence or presence of water at the probe's level and uses the NOT gate to control an indicator, indicating the water level status.

REFERENCES :

Morris Mano, Digital Logic and Computer Design

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