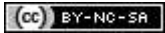


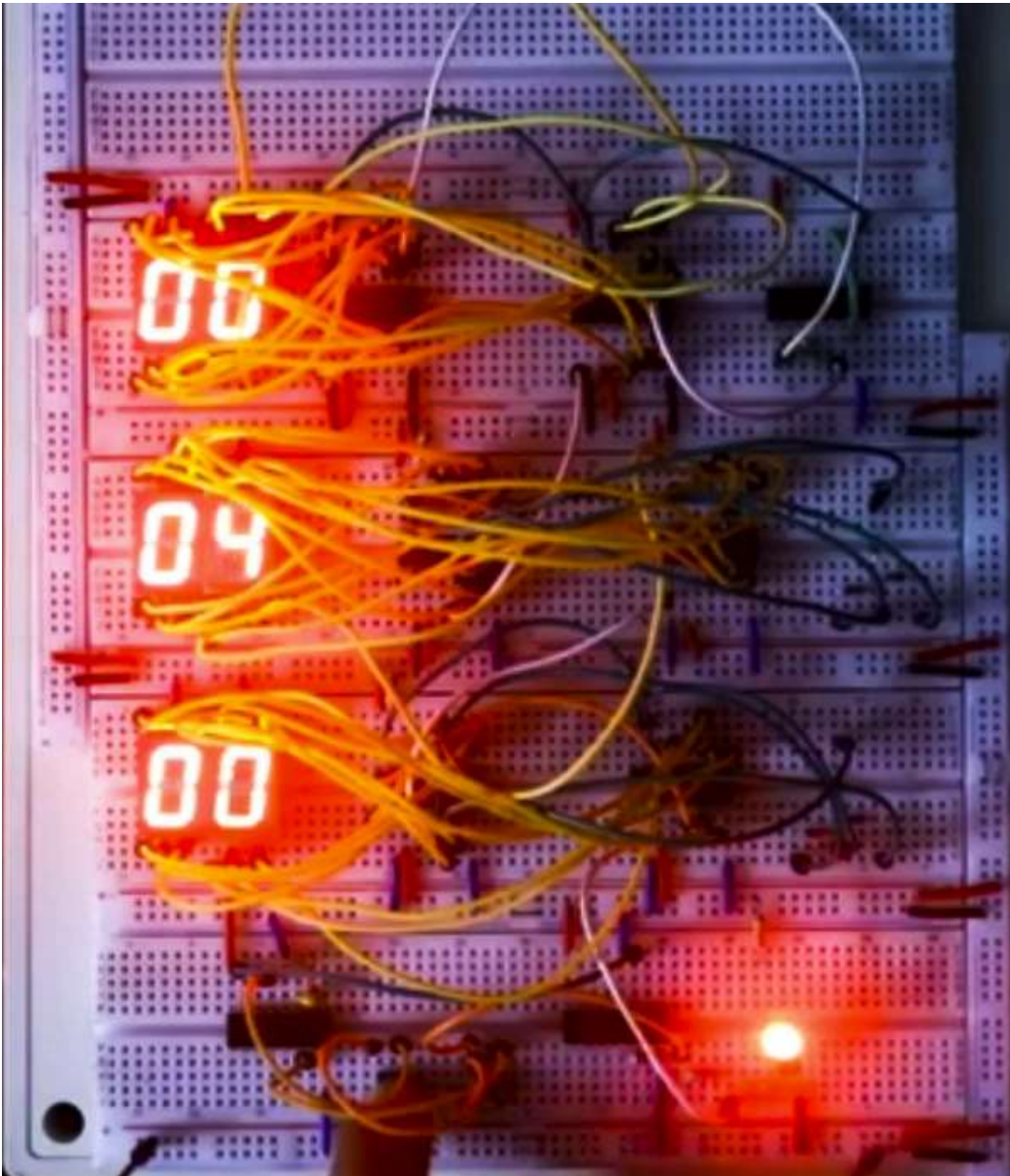
Digital 12 Hrs Clock From Digital Logic IC | Without Microcontroller

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Introduction: Digital 12 Hrs Clock From Digital Logic IC | Without Microcontroller



This project presents the design and implementation of a **digital 12-hour clock** built entirely using **digital logic ICs**, without relying on any microcontroller or programmable device. The clock utilizes standard TTL/CMOS logic components such as **counters (e.g., 7490/4017)**, **decoders**, **flip-flops**, and **logic gates**, along with **7-segment display drivers** to display time in hours, minutes, and seconds in a 12-hour format with AM/PM indication.

The system operates by generating a 1 Hz clock pulse, typically derived from a crystal oscillator and frequency divider circuit, which drives a cascade of binary or decade counters. These counters are configured to count seconds, minutes, and hours, with appropriate logic circuitry to handle rollover at 60 seconds, 60 minutes, and 12 hours. The design includes logic to reset the counters at the right moments and manage the AM/PM toggle. The outputs of the counters are decoded and displayed using 7-segment displays for human readability.

This clock serves as a demonstration of time-keeping fundamentals using purely combinational and sequential logic, offering a practical application of digital electronics principles such as counter design, clock division, and display interfacing. It is particularly suitable for educational purposes, showcasing how complex systems can be constructed from basic logic building blocks without the use of software or firmware.

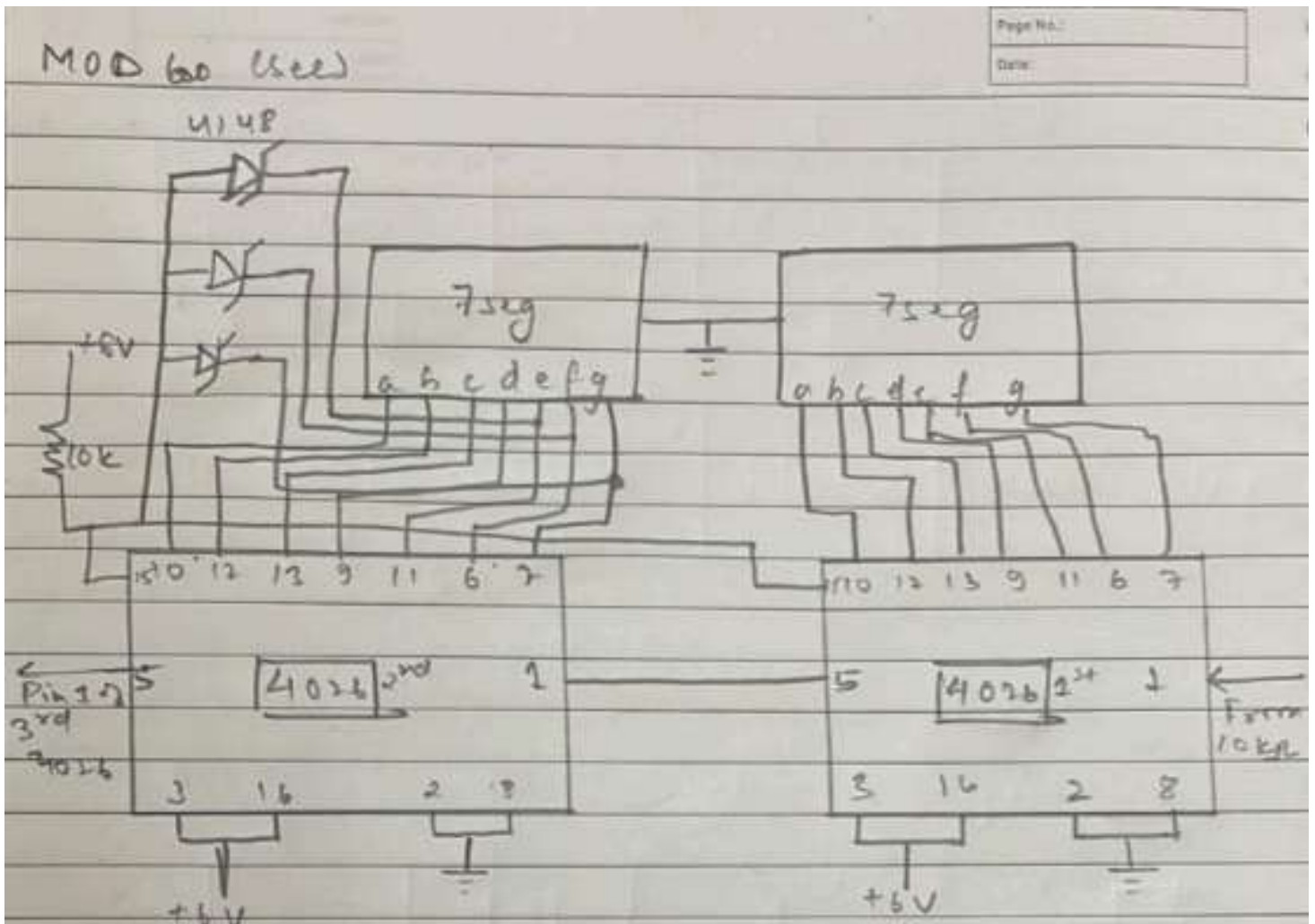
Supplies



Required Components: IC: 1. CD4060 x 2 2. CD4026 x 6 3. 74ls00 x 1 Resistors: 10 K Ohm, 330 Ohm, 330 K Ohm Capacitor: 30 pF Zener Diode: 1N 4148 Miscellaneous: Crystal oscillator 32.768 kHz

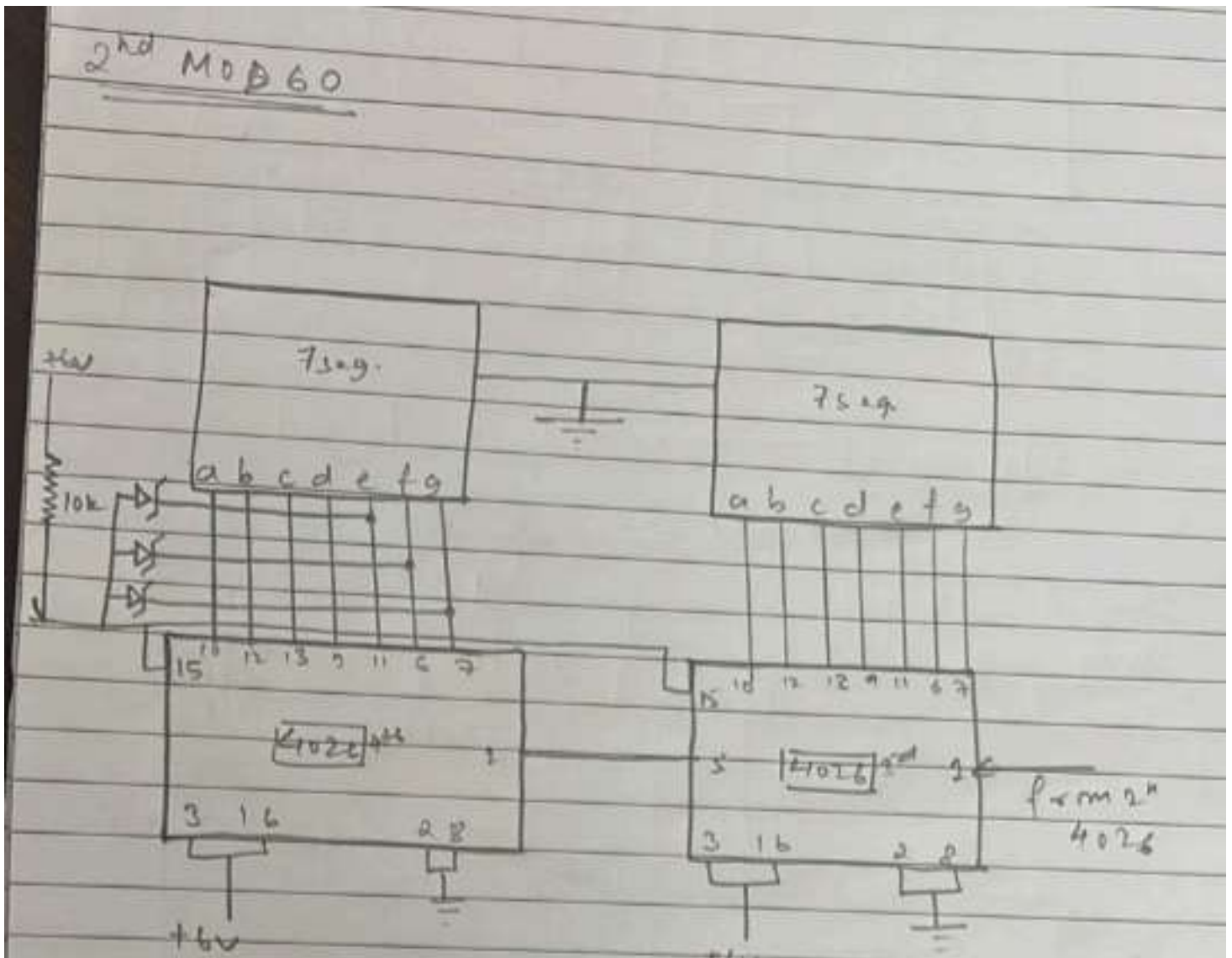
This clock has four stages- 1. Clock pulse generation 2. MOD 60, this is for seconds hand display 3. MOD 60, this is for minutes hand display 4. MOD 12, this is for hours hand display

Step 2: MOD 60, This Is for Seconds Hand Display



This Is for Seconds Hand Display

Step 3: MOD 60, This Is for Minutes Hand Display



This Is for Minutes Hand Display

