

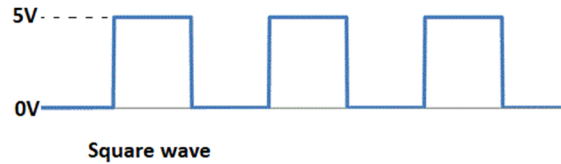
CMPE212 Lab12- Implementing a 4-bit Synchronous Counter

Objective

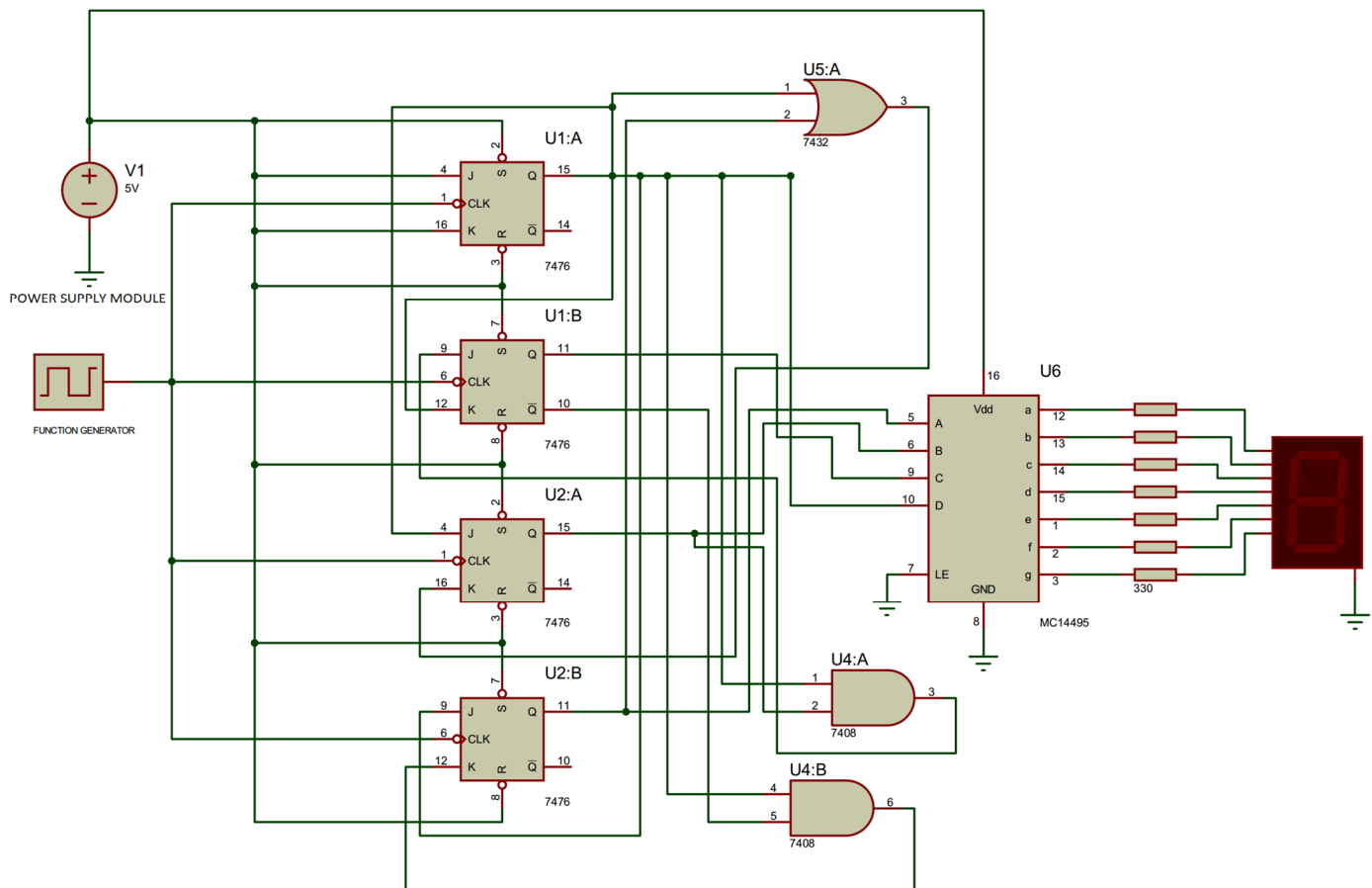
To implement a 4-bit synchronous counter and observe its states in hexadecimal equivalent in a 7-segment display. The sequence of the states in hexadecimal are- 9 > 2 > A > 5 > d > 3 and it will repeat.

Instructions

1. Set your function generator to produce the following clock signal with frequency 1 Hz . Remember the settings- FUNC: SQUA; FREQ: 1; AMPL: 2.5, OFFSET: 1.25.



2. Build the following circuit-

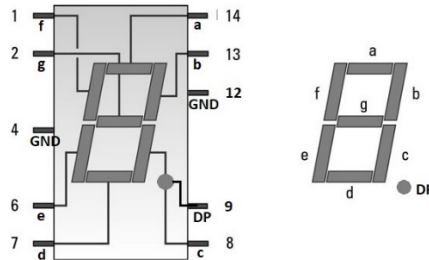


3. Switch the power module ON and observe the output

4. Show the circuit to your TA.

***NOTES:

1) Refer to the following pin diagram of your 7-segment display-



- 2) Note carefully if you have IC 7476 or 74112 for the JK flip-flop. Also, IC MC14495 or DM9368 for the 7-segment display driver. If it's 74112 and/or DM9368, make changes to the circuits according to the corresponding pinout diagram.
- 3) Check carefully if the ground of the function generator and your circuit are connected. They should be always **connected (shorted)**.
- 4) Don't connect the clock signal from the signal generator without observing the signal in the oscilloscope first.
- 5) Give power and ground connections to your ICs which is not shown in the circuit diagram.
- 6) Note that the power supply module shown in the circuit is the same as the one you'll use to give power to your ICs.
- 7) If you're confused about any connection, refer to the K-map and functions for each J and K in the discussion slide.

Remarks

As always-

- Don't forget to use resistors in series with your 7-segment display.
- Don't forget to return the breadboards, multimeters, and cables. Remember, you have 10% of the points for cleaning the workbench.