Faculty of Engineering and Technology

Electrical and Computer Engineering Department

Digital Lab (ENCS2110)

Experiment No.6 Pre-Lab

Title: Sequential Logic Circuits Using Breadboard

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Q1:

What is the appropriate display type (common anode/common cathode) that must be used with 7447 display decoder? Why?

Answer: the outputs of 7447 IC are active low. Regarding to the definitions of common anode/common cathode, the appropriate display type is common anode because the inputs of LED segment must be active low.

Q2:

We would like to limit the current in the LED segments to 10mA. Assuming that the turn-on voltage for the LED's is 1.7v, what is the proper value of the resistors to be connected between the 7447 decoder and the 7-segment display?

Current in the led segment = 10 mA

Turn-on voltage for the LED = 1.7 v

Vcc = 5 v

Vcc – turn-on volate - $V_R = 0$

$5 - 1.7 = V_R$

According to ohm's law: $V_R = IR$

$V_R = 3.3$ v -> $V_R = IR$ -> $R = \frac{VR}{I}$

$R = \frac{3.3}{10*10^{-3}} = 330\ \Omega$

Q3:

Assume that the resistors provided in the lab are 220Ω. What would the current flowing into the LED's be?

R = 220 Ω

V_R = 3.3 v (calculated in Q2)

Ohm's law: $V_R = IR$

3.3 = 220 * I

I = 15 mA

Q4:

Design a decade counter circuit using the 7490 counter, the 7447 decoder, and a 7-segment display. Show the pin numbers on the IC's in your design

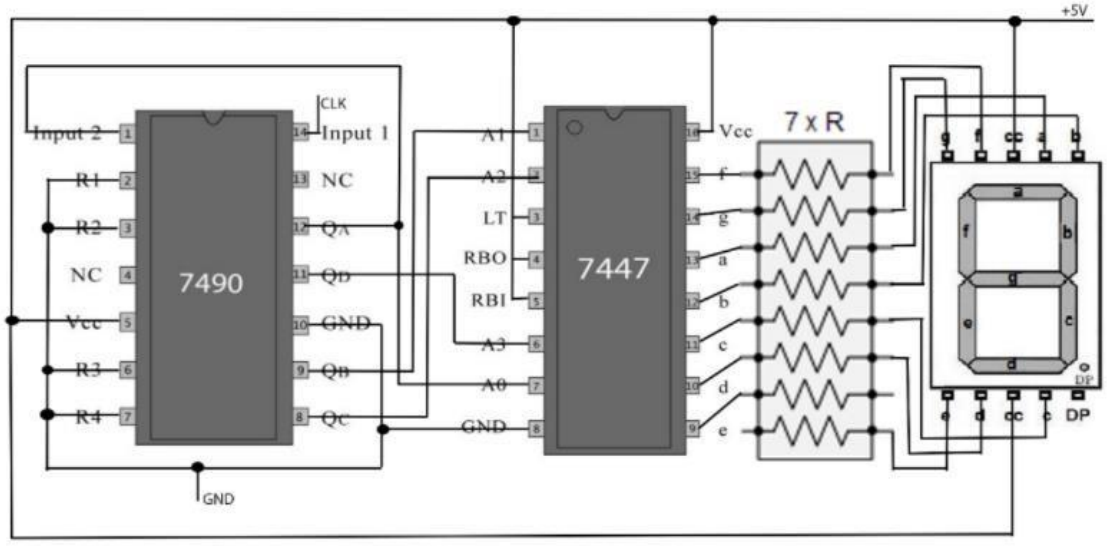

Figure 1: Decade counter circuit