Faculty of Engineering and Technology

Department of Electrical and Computer Engineering

ENCS 2110

EXP 6 Pre-Lab: Sequential Logic Circuits using Breadboard and IC's

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✓ **What is the appropriate display type (common anode/common cathode) that must be used with 7447 display decoders? Explain your answer.**

*The **7447 BCD to 7-segment** decoder/driver is designed to sink current, not source it. That means it pulls the output pins low **(0)** to turn on a segment.*

So, the correct display type is:
*Common Anode, In a common anode display, all anodes **(+)** are tied together and connected to Vcc **(**typically **+5V).***

*Each segment is lit by pulling its cathode **(–)** low, which is exactly what the 7447 does.*

If you used a common cathode display, the 7447 wouldn't work properly because it can't source current to turn on segments.

Assuming that the turn-on voltage for the LEDs is 1.7v, what is the proper value of the resistors to be connected between the 7447 decoder and the seven-segment display, to limit the current in the LED segments to 10mA?

$$V_{LED} = 1.7V$$

$$R = \frac{5V - VLED}{I} = \frac{5-1.7}{0.01} = 330\Omega$$

✓ **Assume that the resistors provided in the lab are 220Ω. What would the current flowing into the LEDs be?**

$$R = 220\Omega$$

$$I = \frac{5V - VLED}{R} = \frac{5-1.7}{220} = 0.015A$$