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6.3 Pre Lab

1) What is the appropriate display type (common anode/common cathode) that must be used with

7447 display decoders? Explain your answer.

In a common anode configuration, all the anodes of the leds devices are connected together and are supplied with positive voltage, but in a common cathode configuration the cathodes of all leds are connected together and supplied with a negative voltage, so the choice between them depends on the specific requirements of the application, if simplicity and power effecting are important. A common anode may be preferable if brightness is a priority. A common cathode configuration may be better.

2) 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?

The common voltage of led is 1.7V and the current is 10ma, we can use Ohms law V=IR. The voltage across resistor is V=5V-1.7V=3.3V, where 5V is supply voltage R=V/I=3.3/10*10^-3=330Ohm .

3) Assume that the resistors provided in the lab are 220Ω. What would the current flowing into

the LEDs be?

If resistors provided in lab=220Ohm and if we connect the LED on voltage of 3.3V, so the current would be I=V/R=3.3/220=0.015A.

4) Design a decade counter circuit using the 7490 counters, the 7447 decoder and a sevensegment display. Show the pin numbers on the ICs in your design.