

## Labs Answer Guide

### **General comments:**

- ❑ Remember; use ink only to write your name and period on all pieces of paper. Everything else must be written in pencil or typed.
- ❑ Remember that you are NOT to write on the cover sheet except for your name, period, truth tables or unless directed by the lab procedure or questions.
- ❑ Remember that you are NOT to use freehand to draw any lines or circles. If you underline something or draw a NOT bar, it must be done with a straight edge. Use YOUR template to draw bubbles and ALL logic gates.
- ❑ Remember that a 1 is a decimal digit and that l is a binary digit.
- ❑ Remember to label all drawings and truth tables! Each unlabeled table or drawing will be counted incorrect.
- ❑ To receive typing extra credit, you must type out the tables when required and label for all drawings.
- ❑ All logic gates must be the same size.
- ❑ All logic diagrams shall **NOT** use the low state indicator (an inverter bubble on the input to a logic gate), but **SHALL** use the Not gate symbol (a triangle with an inverter bubble).
- ❑ Question and answer must be on the same page!

### Lab 1

#### Question

1. The answer is NOT a color. You should choose from +5 Volts, 0 Volts. Do not choose high or low.
2. The answer is NOT -5Volts.
4. The answer is NOT “as the input” or the “same”. This answer does not specify which input or same as what?

### Lab 2

#### Question

1. A single logic diagram means you can only draw ONE logic gate.
2. Using 2-input gates AND gates means you can only draw two lines into each logic symbol.
3. Low is NOT the correct answer. If you answer Low, the answer will be marked wrong.

### Lab 3

Truth table: note that lights are off or on. Do not use high or low.

#### Question

1. A single logic diagram means you can only draw ONE logic gate.
2. Using 2-input gates AND gates means you can only draw two lines into each logic symbol.
4. The answer is NOT a color. You should chose from +5 Volts, 1, high, 0 Volts, low, etc.

### Lab 4

#### Question

1. “Write the Boolean Expression” does NOT mean to draw a picture!

### Lab 5

#### Question

1. “Write the Boolean Expression” does NOT mean to draw a picture!

### Lab 6

#### Question

1. “Write the Boolean Expression” does **NOT** mean to draw a picture!  
Also, do **NOT** write the Boolean Expression of the NAND implementation.

### Lab 8

#### Question

3. “All parts, a-h” are to be done on a separate sheet of paper

### Lab 8b (Bonus)

4. This lab has no question. To receive full credit, you successfully wire, get required signature and turn in with the simplified “NAND” implementation drawn with a template.

Lab 9

Question

1. “Describe the input conditions implies clearly stating the values of R and S. Any implied values of R and S will NOT receive full credit. You should **NOT** use tables!
2. Same comments as question 1.

Lab 10&11

**Asynchronous inputs truth table**

For the inputs of PS = CLR = 1, the mode is not hold. You should select one of the options listed. Also the outputs ( $Q$  and  $\bar{Q}$ ) do not change!

I do consider CLK to be a synchronous input.

Lab 10

1. Drawing the logic diagram does **NOT** include any logic gates!
4. Indicating which output column requires stating before or after the clock pulse.

Lab 11

Question

8. “What is meant by the Toggle position ...” requires stating the values of all the inputs. Also, using the word toggle in this answer may not be sufficient to earn full credit. You must mention before or after the clock pulse.

Lab 13

Question

3. This is NOT a multiple-choice question. You must answer all three parts!

Lab 14

Remember that counters start with 0000 when completing the truth tables

Drawings

- You may **NOT** use the 7493 provided on the lab sheet to construct the required circuits for both the procedure steps and questions.
- You may use the 7493 drawings on the attached sheet. You may use a computer to generate your own drawing of a 7493 IC.

Lab 15

Remember that counters start with 0000 when completing the truth tables

Lab 18

Question

7. You may skip this question.

Lab 21

Procedures steps 2 and 4:

- Remember to show work including the end around carry when performing subtraction problems. Remember to be neat using a straight edge for ALL lines. This probably implies that you should show your work on a separate sheet of paper.

Question

2. Please give the leg numbers of the 7483.
3. Requires two separate answers. State how the  $C_0$  is used in addition and subtraction.
4. Requires two separate answers. State how the  $C_4$  is used in addition and subtraction.

Lab 23

Question

- There are no questions. After you have received the required signature. Turn in the lab sheet with the lab neatly redrawn (with either logic diagrams like lab 22 or using the IC) showing all leg numbers.