Title: **BCD and Logic Diagrams** Test: 6

Course: Introduction to Automation Unit: Introduction to PLC CLO: 4

Name ANSWER KEY Grade 30pts. Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall calculate the correct number conversion base on a number from a different number base system.
2. Student shall draw the output of an instruction given its input(s).

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Test. Grading shall be based on the answer key.

**Instructions**

Calculate the following number to the new number base system given the value from another number base system.

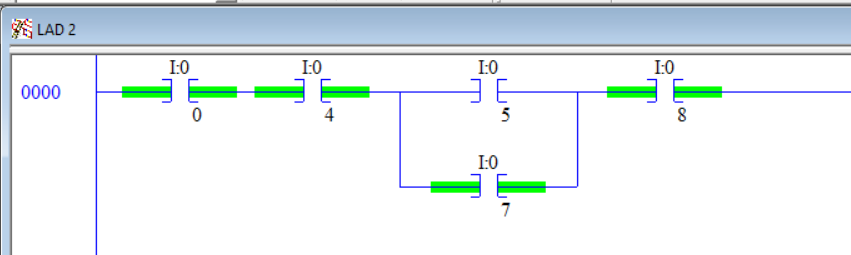
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| 1. 123410 0001 0010 0011 0100BCD | |  |  |  |  |  | | --- | --- | --- | --- | --- | | BCD Truth Table | | | | | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |
| 1. 561210 0101 0110 0001 0010BCD |
| 1. 220110 0010 0010 0000 0001BCD |
| 1. 629810 0110 0010 1001 1000BCD |
| 1. 473610 0100 0111 0011 0110BCD |
| 1. 679110 0110 0111 1001 0001BCD |
| 1. 0101 1001 0011 1000BCD 593810 |
| 1. 1001 0100 1001 0111 BCD 949710 |
| 1. 0111 1000 1001 0110 BCD 789610 |
| 1. 0100 1011 0001 0000 BCD N/A10 | |
| 1. 0000 0001 0010 0111 BCD 12710 | |
| 1. 1000 0011 1001 0110 BCD 839610 | |

**Instructions**

Convert the following sized binary number to the indicated number base. All numbers begin with the LSB.



1. Word A9E516
2. Byte N/ABCD
3. Bit 110
4. Nibble 58
5. Does this rung have continuity? Why or why not? Explain in detail. (2 points)



Yes, there is a path where the following instructions have logical continuity; I/0, I/4, I/7, I/8

**Instructions**

Select the best answer to each multiple-choice question below.

1. An EQU would be used to?
   1. Test two numbers to see if they are the same
   2. Set one number equal to another number
   3. Write a word to an integer
   4. All of the above
2. A GEQ would be used to?
   1. Make sure a number is less than a specific value
   2. Test for a number to be at least a given number
   3. Test two numbers to see if they are not equal
   4. None of the above
3. An OSF would be used to?
   1. Check to see if a value is ON
   2. Force an output value
   3. Indicate that an address just went to 0
   4. Test a number for FALSE
4. A OTU could be used to?
   1. Clear a bit value
   2. Turn on a pilot light
   3. Counting up to a certain Preset then setting the done bit
   4. Is used to test for a 0
5. Fill in the state of each counter bit (0 or 1). (3 points)

|  |  |
| --- | --- |
|  | CU 1  DN 1  OV 0 |

1. How does a number become negative inside the PLC?
   1. The first bit indicates the sign
   2. The MSB equaling 1
   3. All the bits are 1
   4. None of the above

**Instructions**

Draw the output to the following logic diagrams.





Draw the output to the following logic diagrams.



