

## **Term End Examination - November 2014**

Course : ITE205 - Digital Electronics and Microprocessors Slot : B1+TB1

Class NBR : 5710

Time : Three Hours Max.Marks:100

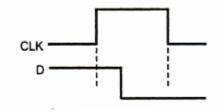
- 1. Represent  $(7)_{10}$  in 4-Bit BCD in the following notations
  - (a) 3 3 2 1
- (b) 7 4 2 1
- (c)  $74\bar{2}\bar{1}$
- (d) 5 3 1 1
- (e) 4 2 2 1
- 2. Minimize the following expression using K-Map.

$$Y = \overline{A}B\overline{C}\overline{D} + \overline{A}B\overline{C}D + AB\overline{C}\overline{D} + AB\overline{C}D + A\overline{B}\overline{C}D + \overline{A}\overline{B}C\overline{D}$$

3. Implement the following Boolean Expression using NOR – NOR Logic.

$$Y = A C + B C + A B + D$$

4. The D-Input and a single clock pulse are shown in the figure. Compare the resulting Q outputs for Positive Edge Triggered Flip Flops, Negative Edge Triggered Flip Flops and Pulse Triggered Master slave Flip Flops. The Flip flops are initially in RESET Condition.

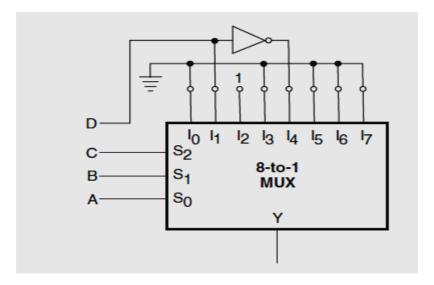


- 5. Assume 16MHZ clock source in a system. How will you divide this frequency by a factor of 8? Explain your logic with suitable diagrams.
- 6. Find out the step size and analog output for 4 bit R-2R ladder DAC when the input is 1000 and 1111. Assume  $V_{ref} = +5V$ .
- 7. Illustrate the importance of Overflow Flag.
- 8. Draw the block diagram of interfacing 8255 to 8086 in I/O Mapped I/O Mode.

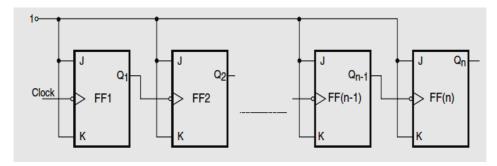
## PART - B (6 X 10 = 60 Marks)

## Answer any SIX Questions

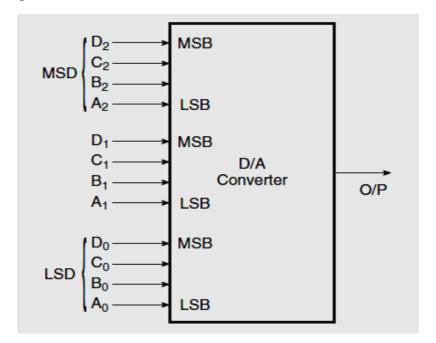
- 9. Plot the Function F(A, B, C, D) = ABCD + AB'C'D' + AB'C + AB on a 4 Variable Map and obtain their simplified expression.
- 10. Add -118 and -32 firstly using eight-bit 2's complement arithmetic and then using 16-bit 2's complement arithmetic. Comment on the results.
- 11. The figure shows the use of 8 to 1 Multiplexer to implement a certain Logic Function. From the given logic circuit arrangements derive the Boolean expression.



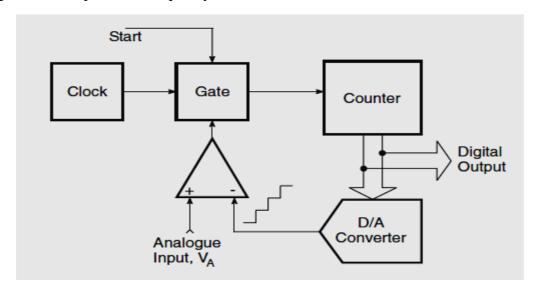
12. It is desired to design a binary ripple counter of the type shown in Figure that is capable of counting the number of items passing on a conveyor belt. Each time an item passes a given point, a pulse is generated that can be used as a clock input. If the maximum number of items to be counted is 6000, determine the number of flip-flops required.



13. Refer to Figure This BCD D/A converter has a step size of 6.25 mV. Determine the full- scale output.



14. Determine the conversion time of a 12-bit A/D converter of the counter type as shown in Figure for an input clock frequency of 1 MHz.



- 15. Write a Program to find the 1's and 2's Complement of a Number.
- 16. Draw the Functional Block Diagram of 8257 DMA Controller.

