

## Assignment 2

1. a) Explain the INVALIDITY condition of the following Memory
  - (i) D Flip Flop
  - (ii) S-R Flip flop
  - (iii) Jk Flip Flop  
b) Explain the operation of D Flip Flop and T flip Flop.
2. a) What is the significance of a memory cell's stability and reliability in digital systems  
b) What is meant by memory Expansion? Mention its limit.  
c) With the help of diagram explain the memory array concept in the memory cell.
3. a) Explain the following terms
  - (i) Aliasing
  - (ii) Nyquist rate
  - (iii) Explain the concept of signal reconstruction in the context of converting a discrete signal back into a continuous signal. What are the factors that affect the quality of the reconstructed signal?
  - (iv) Describe the concept of digital-to-analog conversion (DAC). How does it convert a discrete signal back into a continuous signal?
  - (v) Describe the process of quantization in the context of converting a continuous signal into a discrete signal. What is the role of quantization levels in this process?
4. a) With the help of the diagram explain the basic configuration of PAL.  
b) Given the following truth table below, Implement PRO,PAL, PLA memory

Input			Output			
x	Y	z	A	B	C	D
0	0	0	0	1	0	0
0	0	1	1	1	0	1
0	1	0	1	0	1	1
0	1	1	0	0	0	1
1	0	0	1	0	0	0
1	0	1	0	0	0	1
1	1	0	1	1	1	0
1	1	1	0	1	0	1

5. Implement the PROM, PLA and PAL programming logic circuit from the following Boolean algebra

(i)  $X(A, B, C, D) = \sum m(0, 2, 3)$   
 $Y(A, B, C, D) = \sum m(0, 4, 6, 14)$   
 $P(A, B, C, D) = \sum m(2, 3, 9, 10)$

(ii)  $A(x, y, z) = \sum m(0, 1, 3)$   
 $B(x, y, z) = \sum m(0, 3, 6, 7)$   
 $C(x, y, z) = \sum m(0, 1, 3, 7)$

(iii) Implement the PROM, PAL and PLA from the following truth table.

A	B	C	F1	F2
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	1	0
1	1	1	1	1