1) Convert the decimal number 124 in
   (a) BCD (b) Gray Code (c) Excess-3  (3)
ii) Perform \((14)_{10} - (29)_{10}\) using 2’s complement.  (3)
iii) Implement the OR gate Expression using NAND Gate?  (3)
iv) Implement the AND gate expression using NOR?  (3)
v) What is the difference between combinational & sequential logic?  (4)
vi) Write the difference between SRAM and DRAM?  (4)

**Section – A**

2(a) Construct the Hamming code for 1011 for even parity.  (6)
(b) Realize & implement the parity checker circuit for odd parity.  (8)
(c) Simplify the following  (6)
\[
F = \overline{A}(\overline{B} + \overline{C}) + BC + A\overline{C} \\
F = \overline{A}(B + \overline{C}) + \overline{A}C + \overline{C}(A + \overline{B})
\]
3(a) Implement the EX-OR & Ex-NOR Gate Expression using NAND & NOR Gate?  (10)
(b) Reduce the following function using k-map technique  (10)
\[
F(A,B,C,D) = \pi M(0,3,4,7,8,10,12,14)+d(2,6)
\]
4(a) Implement the full adder circuit using 8:1 MUX.  (10)
(b) Design a Binary to gray code converter?  (10)

**Section – B**

5(a) Find out the following for a given state transition diagram:- (15)
   - State table
   - State reduction

(b) What is the significance of excitation table?  (5)

6(a) Implement the full adder circuit using PAL.  (14)
(b) What is PLA? Explain with block diagram.  (6)

7(a) write short note on any two of the following:  (14)
   - Hazards
   - designing procedure ASL circuits
   - FPGA
(b) What is the difference between primitive & Non-primitive flow table?  (6)