**QP Code : 30702**

**(3 Hours)**          **[Total Marks : 80**

N.B. (1) Question No. 1 is compulsory

(2) Assume suitable data if necessary

(3) Attempt any three questions from remaining questions

1

(a) Convert $(532.125)_8$ into decimal, binary and hexadecimal.          (3)

(b) Convert $(47.3)_7$ BCD, Excess-3 and Gray code.          (3)

(c) Subtract using 1's and 2's complement method $(56)_{10} - (76)_{10}$.          (4)

(d) Obtain odd parity Hamming code for 1011.          (2)

(e) Implement Ex-OR gate using NOR gate only.          (2)

(f) Perform the following operations without changing the base.          (4)

i) $(314)_8 + (737)_8$          ii) $(312.40)_5 + (214.33)_5$

(g) State and prove Demorgans theorem.          (2)

2 (a) Reduce equation using Quine McCluskey method and realize circuit using          (10)
basic gates.

$F(A,B,C,D) = \sum m (1, 3,7,9,10,11,13,15)$.

(b) Design 8 bit BCD adder.          (10)

3 (a) Design a logic circuit to convert Gray to BCD code.          (10)

(b) Implement the following using only one 8:1 Mux and few gates.          (5)

$F(A,B,C,D) = \sum m (0,3,5,7,9,,13,15)$

(c) Design a full adder circuit using half adders and some gates.          (5)

4 (a) Compare TTL and CMOS logic.          (5)

(b) Implement Full subtractor using Demultiplexer.          (5)

(c) Explain 4 bit Universal shift register.          (10)

5 (a) Design mod 5 asynchronous UP counter.          (10)

(b) Convert SR flipflop to JK flipflop and D flipflop.          (10)

6 Write short note on (any four):-          (20)

(a) VHDL

(b) Decade Counter

(c) State table

(d) 4-bit Magnitude comparator

(e) Multivibrators

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