

S.E. (SEM - III) (CBSGS) (COMPUTER ENGG.)  
DIGITAL LOGIC DESIGN AND ANALYSIS

30th May 2016  
3.00 pm to 6.00 pm

**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

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