

S.E. Sem. III [EXTC]
Digital Electronics
Prelim Question Paper

Time : 3 Hrs.]

[Marks : 80

- N.B.:** (1) Question No. 1 is **compulsory**.
 (2) Out of **remaining** questions, attempt any **three** questions.
 (3) **Assume** suitable **data** if **required**.
 (4) **Figures** in brackets on the right hand side indicate full marks.

1. (a) Implement Ex-NOR gate using NOR gates. [5]
 (b) Compare asynchronous counter with synchronous counter. [5]
 (c) Convert SR Flip-Flop into D Flip-Flop and T Flip-Flop. [5]
 (d) Implement full adder using 8:1 multiplexers. [5]

2. (a) State and prove De-Morgan theorem? Also prove Boolean algorithm laws. [10]
 (b) Explain how master slave JK Flip-Flop avoids race around condition. [10]

3. (a) Design BCD to Ex-3 code converter. [10]
 (b) Explain 4 bit bidirectional shift register. [10]

4. (a) Reduce the following function using Quine Mc-Clusky method : [10]
 $f(A,B,C,D) = \sum m(0,2,5,7,8,10,12,15)$
 (b) Draw block diagram of Internal architecture of XC 9500 family CPLD and explain. [10]

5. (a) Write VHDL code of 1:8 De-mux. [10]
 (b) Design a circuit with optimum utilization of PLA to implement following functions : [10]
 $f_1 = \sum m(1,3,4,5,6,7)$ $f_2 = \sum m(1,2,5)$
 $f_3 = \sum m(0,1,4,5,6)$ $f_4 = \sum m(0,1,3,7)$

6. (a) Explain BCD adder with suitable example. [8]
 (b) Explain static RAM. [6]
 (c) Explain Mealy and Moore machines. [6]

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