T.E. (EXTC) (Sem-VI) (CB)    Date-16/12/19

( 3 Hours )                    ( Total Marks : 80 )

**Please check whether you have got the right question paper.**

N.B.:    1)    Question No.1 is **compulsory**.

2)    Solve **any three** from remaining **five** questions.

1.  a)  Explain charge sharing in brief.                                          (04)

b)  Write a program for 3:8 decoder in HDL.                                (04)

c)  Explain different Clock generation styles in brief.                    (04)

d)  Compare Semi custom and full custom design.                          (04)

e)  Draw HLSM for Soda dispenser machine.                               (04)

2.  a)  Explain 1-bit adder and Implement sum and carry circuit using CMOS.   (10)

b)  Implement the following using different MOS design styles :           (10)

1)    XNOR gate using Static CMOS,

2)    Y = not (A + BC) using Dynamic CMOS,

3)    Y = (A + BC + DE + F) using Pseudo NMOS and

4)    XOR gate using Domino logic style.

3.  a)  Draw and explain operation of 6-T SRAM in detail.                     (10)

b)  Design Sum of absolute differences circuit using RTL design technique. Draw   (10)
HLSM, Data path, Interface and Controller FSM.

4.  a)  Realize D-Latch using Tristate and DFF using TG gate and write a program for   (10)
DFF in HDL.

b)  Design 4X4 array multiplier.                                          (05)

c)  Implement Barrel shifter circuit using MOS.                          (05)

5.  a)  Implement SR latch using CMOS design and draw its layout using $\lambda$ based rules.   (10)

b)  Explain Carry select Adder circuit in detail.                        (05)

c)  Design HLSM for laser based distance measure.                        (05)

6.  Write short notes on :

a)  Input circuit.                                                        (05)

b)  Flash memory.                              .                          (05)

c)  Interconnect Delay Model.                                             (05)

d)  ROM.                                                                  (05)

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