SVKM'S NMIMS STME, Navi-Mumbai Campus
FE CSBS Sem II
PEE : Graded Assignment 4
Max. Marks : 5

Last date of submission for written assignment: March 24, 2020
Instruction: Please mail the soft copy of your scanned assignment to `toral.shah@nmims.edu` with **PEE_GA4_name_rollno** in the subject line.

Q1. Give the classification of oscillators, explain any one type of oscillator.

Q2. Use Boolean Algebra and Demorgan's theorems to solve the following

Simplify the following Boolean expressions to a minimum number of literals:

(a)* $xy + xy'$
(b)* $(x + y)(x + y')$
(c)* $xyz + x'y + xyz'$
(d)* $(A + B)'(A' + B')'$
(e) $(a + b + c')(a' b' + c)$
(f) $a'bc + abc' + abc + a'bc'$

Simplify the following Boolean expressions to a minimum number of literals:

(a)* $ABC + A'B + ABC'$
(b)* $x'yz + xz$
(c)* $(x + y)'(x' + y')$
(d)* $xy + x(wz + wz')$
(e)* $(BC' + A'D)(AB' + CD')$
(f) $(a' + c')(a + b' + c')$

Reduce the following Boolean expressions to the indicated number of literals:

(a)* $A'C' + ABC + AC'$ — to three literals
(b)* $(x'y' + z)' + z + xy + wz$ — to three literals
(c)* $A'B(D' + C'D) + B(A + A'CD)$ — to one literal
(d)* $(A' + C)(A' + C')(A + B + C'D)$ — to four literals
(e) $ABC'D + A'BD + ABCD$ — to two literals

Q3.

Convert each of the following to the other canonical form:

(a) $F(x, y, z) = \sum(1, 3, 5)$

(b) $F(A, B, C, D) = \prod(3, 5, 8, 11)$

Convert each of the following expressions into sum of products and product of sums:

(a) $(u + xw)(x + u'v)$

(b) $x' + x(x + y')(y + z')$

Q4.

Write the Boolean equations and draw the logic diagram of the circuit whose outputs are defined by the following truth table:

Table P2.27

f_1	f_2	a	b	c
1	1	0	0	0
0	1	0	0	1
1	0	0	1	0
1	1	0	1	1
1	0	1	0	0
0	1	1	0	1
1	0	1	1	1

f_1 and f_2 are outputs, a, b, c are inputs