VIT
Vellore Institute of Technology

Continuous Assessment Test – I

Programme Name & Branch: B. Tech CSE

Course Name & Code: Digital Logic and Design (CSE1003)

Class Number: VL2018195002389/2391/2392/2395/2397/2400/2401 /2402/2406/2407/ 2408/2409 **Slot: B2+TB2**

Exam Duration: 90 Minutes **Maximum Marks: 50**

Question		Marks
1.	(a) Convert the following decimal numbers to the indicated bases: i. **1938.257 = ( )$_{16}$** ii. **175.175 = ( )$_2$**	(2*5=10)
	(b) The following calculation was performed by a particular breed of unusually intelligent chicken. If the radix r used by the chicken corresponds to its total number of toes, how many toes does the chicken have on each foot? $(34)_r + (24)_r) \cdot (21)_r = (1480)_r$	
2.	(a) List salient features of the BCD, Excess 3 and gray codes. (b) What is error detection code and how it is used? (c) Express the following decimal numbers in 2421 and 5421 code i. 6734 ii. 1993 (d) Express the following decimal numbers in Excess-3 code i. 3421 ii. 426 (e) Subtract decimal numbers (76425 – 28321) using 9's complements	(5*2=10)
3.	Reduce the following expression using tabulation method and find the essential and non-essential prime implicants **F(A,B,C,D,E) = ∑m(0,1,2,3,5,7,8,12,17,19,20,21,23,24,26,27,28,30)**	(10)
4.	(a) A lamp outside a front door comes on automatically when it is dark and someone stands on the doormat outside the front door. A pressure sensor under the mat changes from OFF (0) to ON (1) when someone stands on the doormat. The light sensor is ON (1) when outdoor is bright and OFF (0) when it is dark. Draw the design for the given scenario using only universal gates. (b) Reduce them to a minimum number of literals using the rules of Boolean algebra i. **(BC' + A'D)(AB' + CD')** ii. **B'D + A'BC' + ACD + A'BC**	(2*5=10)
5.	Simplify the following 5 variable Boolean expression in SOP using K map, where min-terms and don't care conditions are given as follows: F(A,B,C,D,E)= $\sum m(0,1,3,5,7,8,14,17,20,24,25,26,29,30,31)$ and **X(11,12,15,18,19)**	(10)