

**VIT**Vellore Institute of Technology
(Creating the Future)**D1****School of Computer Science Engineering and Information Systems****CAT -1 (WINTER 2023-24)**

Programme: B.Tech

Branch: Information Technology

Course Title: Digital Logic and Microprocessor

Course Code: BITE202L

Time: 90 mins

Max. Marks: 50

Class ID: VL2023240503035, VL2023240503036 VL2023240503040 Faculty: Prof.I Mala Serene ,
Prof. S.Nithya & Prof. D. Karthikeyan

S.No.	Answer All the Questions	Marks
1	a) Convert to hexadecimal and then to binary. $(3283.715)_{10}$ to $(?)_{16}$ b) Convert $(11011.101)_2$ to $(?)_{10}$ c) Perform BCD Addition of 8765 and 3943 d) Subtract $(111.111)_2$ from $(1010.01)_2$	10
2	a) Find the complement of the given expression using DeMorgan's law and also the same using Duality. $(AB' + CD)E' + E$ b) Reduce the given Boolean expression to the indicated number of literals: $A'B(D' + C'D) + B(A + A'CD)$ to one literal	5+5
3	Solve the given sum of products function minimization using five variable k map. $F(P,Q,R,S,T) = \sum(0,2,4,7,8,10,12,16,18,20,23,24,25,26,27,28)$	10
4	You should wear your overshoes if you are outside in a heavy rain and you are wearing your new suede shoes, or if your mother tells you to. Express the given problem in POS form of expression. Implement using only NOR gates.	10
5	a) Using a decoder and external gates, design the combinational circuit by the following three Boolean functions: $F_1 = x'y'z' + xz$ $F_2 = xy'z' + x'y$ $F_3 = x'y'z + xy$ b) Implement the function with the 8*1 multiplexer $F(A,B,C,D) = \sum(0,1,2,3,4,9,13,14,15)$	5+5