

**CONTINUOUS INTERNAL EVALUATION- 1**

Dept:EC	Sem / Div:III A&B	Sub:Digital System Design	S Code:18EC34
Date:20-10-2020	Time: 2:30-4:00 pm	Max Marks: 50	Elective:N
Note: Answer any 2 full questions, choosing one full question from each part.			

Q N	Questions	Marks	RBT	COs
<b>PART A</b>				
1 a	Simplify $G=f(w,x, y, z)=\prod M(1,3,8,10,12,13,14,15)$ in POS form and implement using NOR gates.	7	L3	CO2
b	Find minimal sum of the following boolean function using Quine McCluskey Method $f(a,b,c,d)=\sum(7,9,12,13,14,15)+dc(4,11)$	10	L2	CO2
c	Explain 4-bit carry look ahead adder with necessary diagram and relevant expression	8	L2	CO1
<b>OR</b>				
2 a	Simplify the given function by K-map method: $f(a,b,c,d,e)=\sum m(3,7,11,12,13,14,15,16,18)+dc(24,25,26,27,28,29,30,31)$	7	L3	CO2
b	Identify Prime Implicants and Essential Prime Implicants of the following Boolean function: $f(a,b,c,d)=\sum(6,7,9,10,13)+\sum d(1,4,5,11,15)$ . Draw the diagram using NAND gates.	10	L2	CO1,2
c	Define the Following: 1. Literal 2. Minterm 3. Maxterm 4. Canonical SOP 5. Canonical POS 6. Prime Implicants 7. Essential Prime Implicant 8. Sum term	8	L1	CO1
<b>PART B</b>				
3 a	Explain full adder using two half adders and one or gate with neat diagram, truth table and minimized expression.	7	L2	CO1
b	Find minimal sum of the following boolean function using Quine McCluskey Method $f(a,b,c,d)=\sum m(2,3,4,5,13,15)+d(8,9,10,11)$	10	L2	CO2
c	Expand the following into canonical form I) $f1=a+bc+ac'd$ into minterms	8	L2	CO1

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	II) $f_2 = a(b+c)(a+c+d)$ into maxterms			
<b>OR</b>				
4	a) Design a logic circuit that controls the passage of a signal 'A' according to the following requirement. i) Output 'X' will equal 'A' when control inputs 'B' and 'C' are same. ii) 'X' will remain high when 'B' and 'C' are different. Implement the circuit using suitable gates.	10	L2	CO2
	b) Obtain minimal expression using k-map for the following incompletely specified function: $F(a,b,c,d) = \sum m(0,1,4,6,7,9,15) + \sum d(3,5,11,13)$ and draw the circuit diagram using gates	10	L2	CO1,2
	c) Minimize using K-map: $f(a,b,c,d) = \sum (0, 1, 4, 6, 7, 9, 15) + \sum d(3, 5, 11, 13)$	5	L2	CO1

Note:

1. Send the Answer script (single PDF file) to following mail ids

- 1) 3<sup>rd</sup> sem 'A' section: [gurusandesh.vcet@gmail.com](mailto:gurusandesh.vcet@gmail.com)
- 2) 3<sup>rd</sup> sem 'B' section: [nishavcet2014@gmail.com](mailto:nishavcet2014@gmail.com)