

**End Semester Examination (February 2022)****Academic Year: 2021-2022**

<b>Max. Marks: 50</b>	<b>Duration: 2 Hr.</b>
Class: SY B.Tech	Semester: III
Course: Digital Electronics	Course Code: DJ19CEC305
Program: Computer Engineering	
<b>Instructions:</b> (1) Solve ANY FIVE questions. (2) Read the questions carefully. (3) Assume suitable data wherever required, but justify it. (4) All questions carry equal marks. (5) Answer to each new question is to be started on a fresh page. (6) Figure to the right indicate full marks. (7) Draw the neat labelled diagrams wherever necessary.	

Question No.		Max. Marks
Q1 (a)	Subtract using 1's and 2's complement method : $(23)_{10} - (50)_{10}$	[4]
Q1 (b)	Convert $(1762.46)_{10}$ to equivalent Octal, binary and Hexadecimal.	[6]
Q2 (a)	Simplify the following Boolean function using Boolean theorem. i) $\overline{AB}(CD + \overline{EF})(\overline{AB} + \overline{CD})$ ii) $\overline{\overline{AB} + \overline{ABC}} + A(B + \overline{AB})$	[5]
Q2 (b)	Minimize the following equation using K-maps and realize using NOR gates only.  $F(W, X, Y, Z) = \pi M(1, 2, 3, 8, 9, 10, 11, 14) * d(7, 15)$	[5]
Q3 (a)	Implement the following expression using 8:1 MUX and few gates. $F(A, B, C, D) = \sum m(0, 1, 3, 4, 5, 7, 9, 10, 12, 13, 15)$	[5]
Q3 (b)	In a space craft there are two doors: front door and rear door. Both the doors are equipped with three sensors: s1 , s2 and s3. The front door opens if any two sensors are on and rear door opens only when s3 is on and s2 off. Design a combinational circuit to open the front door and rear door. Also realize the logic circuit using minimum number of gates.	[5]



Q4	Convert JK flip flop to D- Flip-Flop.	[10]
Q5	Design mod 11 asynchronous counter using JK flip flop.	[10]
Q6 (a)	What is race around condition? Explain Master –slave JK flip flop in detail.	[6]
Q6 (b)	Differentiate between PLA and PAL.	[4]

All the Best!