Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14EC2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIGITAL ELECTRONICS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Perform the following function:   1. 199 Decimal to Octal. 2. 743 Octal to Decimal. 3. ACD Hexadecimal to Decimal. 4. 381 Decimal to Binary. | CO1 | 12 |
| b. | Construct the truth table for the boolean functions: F = x + y'z  Draw the logic diagram for the same with minimum number of logic gates. | CO1 | 8 |
| **(OR)** | | | | |
| 2. | a. | Design a half adder using NAND gates only. | CO2 | 10 |
| b. | Summarize all the postulates of Boolean algebra. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Simplify the expression using Karnaugh map  Y=∑m (0,1,4,5,6,8,9,12,13,14) | CO1 | 10 |
| b. | Design and implement a 4-bit gray to binary code converter. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Simplify the Boolean function  F (x,y,z) = ∑m (0,2,4,5,6) | CO1 | 6 |
| b. | Minimize the following function using QM method  f(A,B,C,D)= ∑m (0,5,7,8,9,10,11,14,15) | CO1 | 14 |
|  |  |  |  |  |
| 5. | a. | Perform F(A,B,C,D)= ∑ (1,3,4,11,12,13,14,15) using multiplexer. | CO2 | 10 |
| b. | Write detailed notes on the following:  i) JK Master Slave Flip flop  ii) T flip flop. | CO2 | 10 |
| **(OR)** | | | | |
| 6. |  | Execute the following synchronous sequential circuit state diagram using D FF. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | Compare synchronous with asynchronous counters. | CO2 | 6 |
| b. | Design Mod 6 synchronous counter using JK flip flop and implement it. | CO2 | 14 |
| **(OR)** | | | | |
| 8. |  | Write brief notes on:  i) Shift Register  ii) Johnson Counter. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Compare the performance of various logic families. | CO3 | 6 |
| b. | With the help of a circuit schematic, explain the operation of CMOS NOR gate. | CO3 | 14 |